

AS AWARDED
W911XK20C0017



**US Army Corps
of Engineers ®**

Detroit District

**HOWARDS BAY SND & GLLA DREDGING
DOUGLAS COUNTY
SUPERIOR, WI**

SPECIFICATIONS

13 AUGUST 2020

Howards Bay SND and GLLA Dredging
AS AWARDED

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The following certification applies to the specifications prepared for the GLLA Dredging (Sections 01 57 19, 02 61 13, 02 61 14, 02 66 00, 31 00 00, 31 32 11, 35 20 23.53, 35 20 24):

I, Mark O. Graveling, P.E., hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that the portion of this document identified above has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Mark O. Graveling, P.E. (WI# 44865)
Engineer of Record, Arcadis U.S., Inc.

Date

SECTION 01 10 10

REAL ESTATE

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Additional Property Agreements; G-RED.

Copies of any agreements for Contractor-acquired real estate rights for this project shall be furnished before entering thereon.

Certified Survey Results

Furnish a copy of certified results of surveys which verify areas and limits of Contractor-acquired real estate rights.

1.2 REGULATORY REQUIREMENTS

1.2.1 Real Estate Rights

Rights for the use of the work and staging areas have been obtained and the general limits of the areas are shown on the drawings. Copies of instruments conveying rights for use of the work and staging areas shown on the drawings and specified herein are available for inspection in the Engineering, Design, & Construction Office, U.S. Army Corps of Engineers, Detroit District, 477 Michigan Avenue, McNamara Building, Detroit, Michigan. Conformance to all applicable requirements of the instruments conveying rights is required. Two (2) copies of each instrument will be furnished to the Contractor. No other real estate rights have been obtained by the Government for this project.

1.2.2 Additional Real Estate Rights

Any additional property agreements and/or real estate rights desired by the Contractor shall be obtained by the Contractor at its own expense. Such agreements shall clearly relieve the Government of any responsibility for damages or liability resulting from the Contractor's use of such grounds.

1.3 PROJECT/SITE CONDITIONS

1.3.1 Location and Verification

It shall be the Contractor's responsibility to accurately locate the limits of all lands utilized under the contract. The corner and angle points of each area for which rights have been obtained shall be marked with semi-permanent markers except where there is an approved existing property marker.

Temporary markers shall be placed at points on alignment. The points on alignment shall be marked at stations so that intervals between points do not exceed 200 feet.

1.3.2 Survey Markers

All markers shall be installed in an area prior to its use and they shall be available for reference during and upon completion of use of the area. Where approved existing property markers are found, a witness stake, as specified in Subparagraph, "Semi-permanent Markers" below, shall be provided. If the types of markers specified hereinafter cannot be used, other types, as approved by the Contracting Officer, shall be provided.

1.3.2.1 Semi-permanent Markers

The markers shall be a steel rod one-half inch in diameter and four (4) feet long. The steel rod shall be driven vertically into the ground so that the top is flush with the finished ground surface. Each marker shall be witnessed by a 2" x 2" yellow stake extending two (2) feet above the ground surface and driven into the ground until stable, with not less than one (1) foot penetration.

1.3.2.2 Temporary Markers

Markers shall be 2" x 2", red-colored, wood hub stakes driven into the ground until stable (not less than one (1) foot penetration) with two (2) feet projecting above the ground surface. If the period in which temporary markers are to be in place exceeds one (1) construction season, a more permanent type of marker, as approved, shall be provided.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 ATTACHMENT

The signed right of entry agreements attached following this Section's "End of Section" designation are part of this Technical Specification Section.

-- End of Section --

City RoE Dredging

**DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR DREDGING**

Howards Bay IIS project
City of Superior, WI

Parcels 048040095300.
See Exhibit "A"

The undersigned, hereinafter called the "Owner," hereby grants to the UNITED STATES OF AMERICA, hereinafter called the "Government," a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government, its agents and assigns an irrevocable right to enter upon the lands as depicted in Exhibit "A", at any time from the date of signing thru 31 December 2022, to perform construction work that includes, but is not limited to, removal of material from the bed of the waterway and slips by dredging within the riparian zone of the property and also the placement of structures, depositing material upon the bed of the waterway in the riparian zone of the property, and including without limitation, sand covers and anchors for monitoring buoys.

2. This right-of-entry includes the right of ingress and egress on other lands of the Owner not described below, provided that such ingress and egress is necessary and not otherwise conveniently available to the Government.

3. The Owner acknowledges the benefits from the dredging of the Howards Bay, Hughitt, and Cummings Slips, and it accepts the benefits of the dredging as full compensation for the use of these parcels.

4. The Owner shall hold and save the Government free from all damages arising from the construction, operation, placement of subsurface caps, and dredging in support of the Howards Bay project, except for damages due to the fault of, or negligence by the Government, its assigns, and/or its contractors.

5. All tools, equipment, buildings, improvements, temporary buoy anchors, and other property taken upon or placed upon the land by the Government shall remain the property of the Government and may be removed by the Government at any time within a reasonable period after the expiration of this right-of-entry. The sand covers will remain after the project is completed and will become property of the riparian owner.

6. The parties agree that, if any action of the Government's employees or agents in the exercise of this right-of-entry results in damage to the real property, the Government will, at its option, either repair such damage or make an appropriate settlement with the Owner. In no event shall such repair or settlement exceed the fair market value of the fee interest of the real property at the time immediately preceding such damage. The Government's liability under this clause may not exceed appropriations available for such payment and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The

provisions of this clause are without prejudice to any rights the Owner may have to make a claim under applicable laws for any other damages than provided herein. If the Government does acquire such title or other necessary interest, damages would be limited to the decrease in the fair market value of the owner's remainder caused by such damage. The Government's liability for damages, claims, suits, costs, and expenses that arise from the activities of the Government under this Right of Entry shall be governed by the Federal Tort Claims Act, 28 USC 1346(b), and other applicable federal laws.

7. The land affected by this permit or right-of-entry is located in the State of Wisconsin, Douglas County, and is shown on the attached Exhibit A.

The land affected by this right-of-entry is located in the County of Douglas, State of Wisconsin, and is described in Exhibit "A":

WITNESSES MY HAND AND SEAL this 7th day of March, 2020



Signature

Mayor

Title

POC info

UNITED STATES OF AMERICA

SHELTON.ANDREW.M.1516398511 Digitally signed by
SHELTON.ANDREW.M.151639851
By: W.M.1516398511 Date: 2020.04.14 09:35:52 -04'00'
ANDREW SHELTON
Chief, Real Estate
Real Estate Contracting Officer

NOTE: THE CERTIFICATE OF AUTHORITY must be executed by an individual other than by the person who signed the agreement. The individual must certify that the official who signed the agreement was authorized to act in that capacity.

CERTIFICATE OF AUTHORITY

I, TERRI KALAN, do hereby certify that I am the
(someone other than the person signing the agreement)

CITY CLERK of the CITY OF SUPERIOR
(my position of responsibility within the organization)

_____ and that JIM PAINE,

who signed the agreement on behalf of the CITY OF SUPERIOR

was at the time of signature its MAYOR,
(position held)

and that the person who executed the agreement on behalf of the

CITY OF SUPERIOR acted within his/her statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification

this 3RD day of MARCH, 2020.

Terri Kalan
(Name)

CITY CLERK
(Title)

City RoE Work and Storage 1

**DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR WORK AND STORAGE AREA**

Howards Bay IIS project

City owned ROW Superior Wisconsin.
See Exhibit "A"

The undersigned, hereinafter called the "Owner," hereby grants to the UNITED STATES OF AMERICA, hereinafter called the "Government," a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government, its agents and assigns an irrevocable right to enter upon the lands as depicted in Exhibit "A", at any time from the date of signing thru 31 December 2022, to perform construction work that includes, but is not limited to a temporary drainage pipeline. In support of the remediation of the bottomlands of the Howards Bay Project. See Exhibit "A".

2. This right-of-entry includes the right of ingress and egress on other lands of the Owner not described below, provided that such ingress and egress is necessary and not otherwise conveniently available to the Government.

3. The Owner acknowledges the benefits from the project and it accepts the benefits of the project as full compensation for the use of this parcel.

4. The Owner shall hold and save the Government free from all damages arising from repair of roads and the construction of a temporary pipeline and connection to, and use of the City's sanitary sewer system, except for damages due to the fault of or negligence by the Government, its assigns, and/or its contractors.

5. All tools, equipment, buildings, improvements, asphalt pad, and other property taken upon or placed upon the land by the Government shall remain the property of the Government and may be removed by the Government at any time within a reasonable period after the expiration of this right-of-entry

6. The parties agree that, if any action of the Government's employees or agents in the exercise of this right-of-entry results in damage to the real property, the Government will, at its option, either repair such damage or make an appropriate settlement with the Owner. In no event shall such repair or settlement exceed the fair market value of the fee interest of the real property at the time immediately preceding such damage. The Government's liability under this clause may not exceed appropriations available for such payment and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The provisions of this clause are without prejudice to any rights the Owner may have to make a claim under applicable laws for any other damages than provided herein. The Government's liability for damages, claims, suits, costs, and expenses that arise from the activities of the Government under this Right of Entry shall be governed by the Federal

Tort Claims Act, 28 USC 1346(b), and other applicable federal laws. If the Government does acquire such title or other necessary interest, damages would be limited to the decrease in the fair market value of the owner's remainder caused by such damage.

7. The land affected by this permit or right-of-entry is located in the State of Wisconsin, Douglas County, and is shown on the attached Exhibit A.

WITNESSES MY HAND AND SEAL this 3rd day of MARCH, 2020



Signature

MAYOR

Title

UNITED STATES OF AMERICA

By: **SHELTON.ANDRE** Digitally signed by
SHELTON.ANDREW.M.151639851
W.M.1516398511 ¹ Date: 2020.04.14 09:40:31 -04'00'
ANDREW SHELTON
Chief, Real Estate
Real Estate Contracting Officer

NOTE: THE CERTIFICATE OF AUTHORITY must be executed by an individual other than by the person who signed the agreement. The individual must certify that the official who signed the agreement was authorized to act in that capacity.

CERTIFICATE OF AUTHORITY

I, TERRI KALAN, do hereby certify that I am the
(someone other than the person signing the agreement)

CITY CLERK of the CITY OF SUPERIOR
(my position of responsibility within the organization)

_____ and that JIM PAINE,

who signed the agreement on behalf of the CITY OF SUPERIOR

was at the time of signature its MAYOR,
(position held)

and that the person who executed the agreement on behalf of the

CITY OF SUPERIOR acted within his/her statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification

this 3rd day of MARCH, 2020.

Terri Kalan
(Name)

CITY CLERK
(Title)

City RoE Work and Storage 2

**DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR WORK AND STORAGE AREA**

Howards Bay IIS project

City owned ROWs in Superior Wisconsin.
See Exhibit "A"

The undersigned, hereinafter called the "Owner," hereby grants to the UNITED STATES OF AMERICA, hereinafter called the "Government," a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government, its agents and assigns an irrevocable right to enter upon the lands as depicted in Exhibit "A", at any time from the date of signing thru 31 December 2022, to perform construction work that includes, but is not limited to road construction and repair in the ROW in support of the remediation of the bottomlands of the Howards Bay Project.

2. This right-of-entry includes the right of ingress and egress on other lands of the Owner not described below, provided that such ingress and egress is necessary and not otherwise conveniently available to the Government.

3. The Owner acknowledges the benefits from the project and it accepts the benefits of the project as full compensation for the use of these road sections.

4. The Owner shall hold and save the Government free from all damages arising from construction work and/or road repair within the City owned ROW, see Exhibit "A" except for damages due to the fault of or negligence by the Government, its assigns, and/or its contractors. These activities are in support of the Howards Bay project.

5. All tools, equipment, and other property taken upon or placed upon the land by the Government shall remain the property of the Government and may be removed by the Government at any time within a reasonable period after the expiration of this right-of-entry.

6. The parties agree that, if any action of the Government's employees or agents in the exercise of this right-of-entry results in damage to the real property, the Government will, at its option, either repair such damage or make an appropriate settlement with the Owner. In no event shall such repair or settlement exceed the fair market value of the fee interest of the real property at the time immediately preceding such damage. The Government's liability under this clause may not exceed appropriations available for such payment and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The provisions of this clause are without prejudice to any rights the Owner may have to make a claim under applicable laws for any other damages than provided herein. The Government's liability for damages, claims, suits, costs, and expenses that arise from the activities of the Government under this Right of Entry shall be governed by the Federal

Tort Claims Act, 28 USC 1346(b), and other applicable federal laws. If the Government does acquire such title or other necessary interest, damages would be limited to the decrease in the fair market value of the owner's remainder caused by such damage.

7. The land affected by this permit or right-of-entry is located in the State of Wisconsin, Douglas County, and is shown on the attached Exhibit A.

WITNESSES MY HAND AND SEAL this 3RD day of MARCH, 2020



Signature

MAYOR

Title

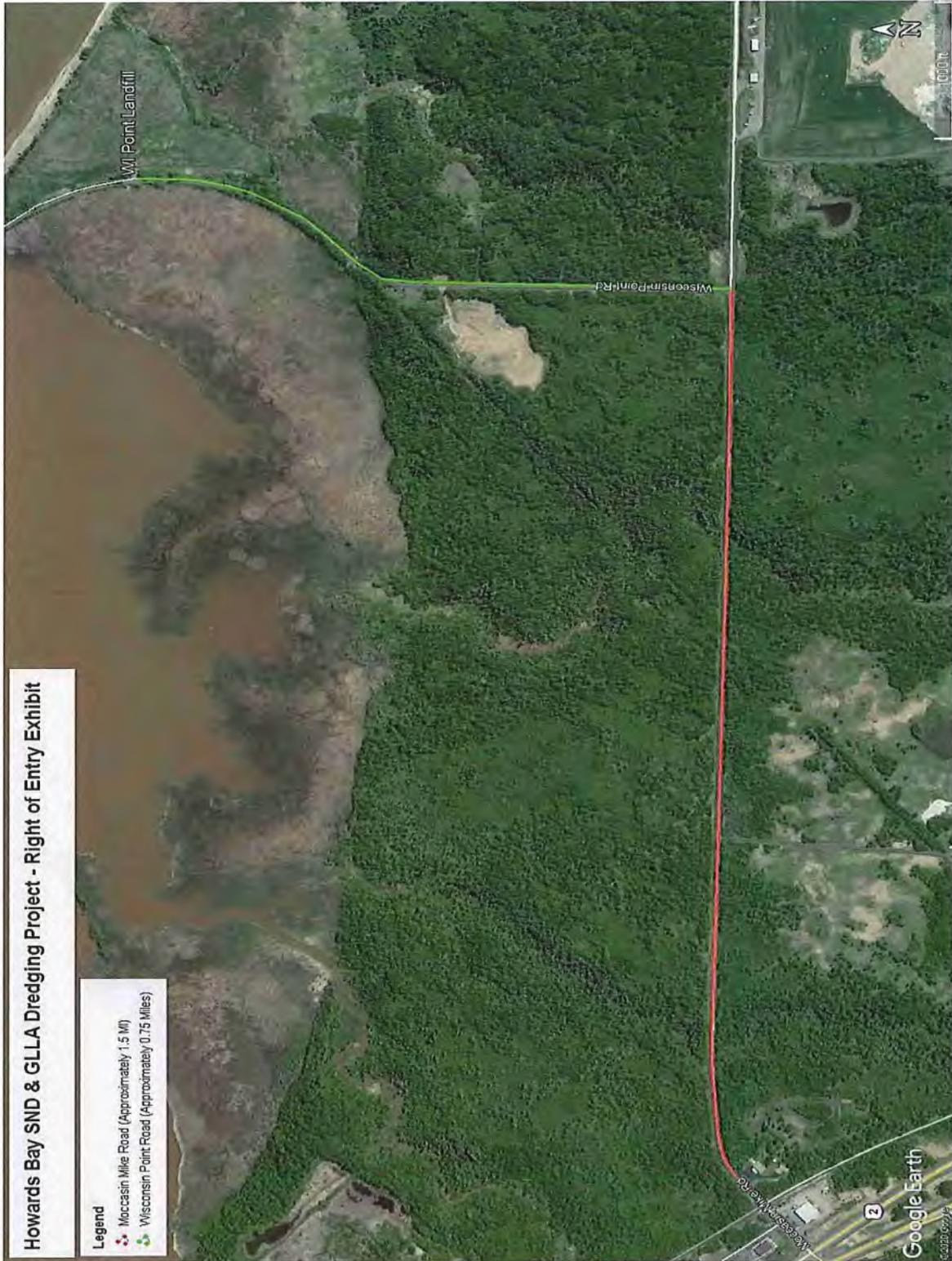
UNITED STATES OF AMERICA

By: SHELTON.ANDRE Digitally signed by
SHELTON.ANDREW.M.151639851
W.M.1516398511 1
Date: 2020.04.14 09:42:20 -04'00'

ANDREW SHELTON
Chief, Real Estate
Real Estate Contracting Officer

City Right of Ways:
Moccasin Mike Road section 1.5 miles &
Wisconsin Point Road section 0.75 miles

EXHIBIT "A"



Fraser Dredging ROE

**DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR DREDGING**

Howards Bay IIS project
Fraser R/E group LLC

Ten Parcels See Exhibit "A"

The undersigned, hereinafter called the "Owner," hereby grants to the UNITED STATES OF AMERICA, hereinafter called the "Government," a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government, its agents and assigns an irrevocable right to enter upon the lands as depicted in Exhibit "A", at any time from the date of signing thru 31 December 2022, to perform construction work that includes, but is not limited to, removal of material from the bed of the waterway and slips by dredging within the riparian zone of the property and also the placement of structures, depositing material upon the bed of the waterway in the riparian zone of the property, and including without limitation, sand covers and anchors for monitoring buoys.

2. This right-of-entry includes the right of ingress and egress on other lands of the Owner not described below, provided that such ingress and egress is necessary and not otherwise conveniently available to the Government.

3. The Owner acknowledges the benefits from the dredging of the Howards Bay, Hughitt, and Cummings Slips, and it accepts the benefits of the dredging as full compensation for the use of these parcels.

4. The Owner shall hold and save the Government free from all damages arising from the construction, operation, placement of subsurface caps, and dredging in support of the Howards Bay project, except for damages due to the fault of, or negligence by the Government, its assigns, and/or its contractors.

5. All tools, equipment, buildings, improvements, temporary buoy anchors, and other property taken upon or placed upon the land by the Government shall remain the property of the Government and may be removed by the Government at any time within a reasonable period after the expiration of this right-of-entry. The sand covers will remain after the project is completed and will become property of the riparian owner.

6. The parties agree that, if any action of the Government's employees or agents in the exercise of this right-of-entry results in damage to the real property, the Government will, at its option, either repair such damage or make an appropriate settlement with the Owner. In no event shall such repair or settlement exceed the fair market value of the fee interest of the real property at the time immediately preceding such damage. The Government's liability under this clause may not exceed appropriations available for such payment and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The

provisions of this clause are without prejudice to any rights the Owner may have to make a claim under applicable laws for any other damages than provided herein. If the Government does acquire such title or other necessary interest, damages would be limited to the decrease in the fair market value of the owner's remainder caused by such damage. The Government's liability for damages, claims, suits, costs, and expenses that arise from the activities of the Government under this Right of Entry shall be governed by the Federal Tort Claims Act, 28 USC 1346(b), and other applicable federal laws.

7. The land affected by this permit or right-of-entry is located in the State of Wisconsin, Douglas County, and is shown on the attached Exhibit A.

WITNESSES MY HAND AND SEAL this 9th day of March, 2020


Signature

President & COO
Title

(715) 395-6543
POC info

UNITED STATES OF AMERICA

By: W.M.1516398511
ANDREW SHELTON
Chief, Real Estate
Real Estate Contracting Officer

Digitally signed by
SHELTON.ANDREW.M.151639851
Date: 2020.04.14 09:43:46 -04'00'

NOTE: THE CERTIFICATE OF AUTHORITY must be executed by an individual other than by the person who signed the agreement. The individual must certify that the official who signed the agreement was authorized to act in that capacity.

CERTIFICATE OF AUTHORITY

I, Nick Hickey, do hereby certify that I am the
(someone other than the person signing the agreement)

Senior Business Analyst of the Fraser Shipyards, Inc.
(my position of responsibility within the organization)

_____ and that David Steninger,

who signed the agreement on behalf of the Fraser Shipyards, Inc.

was at the time of signature its President & COO,
(position held)

and that the person who executed the agreement on behalf of the

Fraser Shipyards, Inc. acted within his/her statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification

this 9th day of March, 2020.

Nick Hickey (Nick Hickey)
(Name)

Senior Business Analyst
(Title)

City Landfill Site ROE

**DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR CONSTRUCTION
WISCONSIN POINT LANDFILL**

Howards Bay IIS project

Parcels 118110699600 & 118110699700

The undersigned, hereinafter called the "Owner," hereby grants to the UNITED STATES OF AMERICA, hereinafter called the "Government," a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government, its agents and assigns an irrevocable right to enter upon the lands as depicted in Exhibit "A", at any time from the date of signing thru 31 December 2022, to perform construction work that includes, but is not limited to, the placement and grading of dredged material in support of the Howards Bays EPA mitigation project.

2. This right-of-entry includes the right of ingress and egress on other lands of the Owner not described below, provided that such ingress and egress is necessary and not otherwise conveniently available to the Government.

3. The Owner acknowledges that benefits from accepting the material from the dredging of the Howards Bay and slips, and also acknowledges that the material will become part of the land and will remain at the placement site becoming property of the Owner after the project is complete. See Exhibit "A" for placement area limits.

4. The Owner shall hold and save the Government free from all damages arising from the construction, operation, and dredge material placement in support of the Howards Bay project, except for damages due to the fault of or negligence by the Government, its assigns, and/or its contractors.

5. All tools, equipment, buildings, improvements, and other property taken upon or placed upon the land by the Government shall remain the property of the Government and may be removed by the Government at any time within a reasonable period after the expiration of this right-of-entry

6. The parties agree that, if any action of the Government's employees or agents in the exercise of this right-of-entry results in damage to the real property, the Government will, at its option, either repair such damage or make an appropriate settlement with the Owner. In no event shall such repair or settlement exceed the fair market value of the fee interest of the real property at the time immediately preceding such damage. The Government's liability under this clause may not exceed appropriations available for such payment and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The provisions of this clause are without prejudice to any rights the Owner may have to make a claim under applicable laws for any other damages than provided herein. If the

Government does acquire such title or other necessary interest, damages would be limited to the decrease in the fair market value of the owner's remainder caused by such damage. The Government's liability for damages, claims, suits, costs, and expenses that arise from the activities of the Government under this Right of Entry shall be governed by the Federal Tort Claims Act, 28 USC 1346(b), and other applicable federal laws.

7. The land affected by this permit or right-of-entry is located in the State of Wisconsin, Douglas County, and is shown on the attached Exhibit A.

WITNESSES MY HAND AND SEAL this 3rd day of MARCH, 2020



Signature

MAYOR

Title

UNITED STATES OF AMERICA

By: SHELTON.ANDREW.M.1516398511
ANDREW SHELTON
Chief, Real Estate
Real Estate Contracting Officer

Digitally signed by
SHELTON.ANDREW.M.151639851
Date: 2020.04.20 09:41:10 -04'00'

NOTE: THE CERTIFICATE OF AUTHORITY must be executed by an individual other than by the person who signed the agreement. The individual must certify that the official who signed the agreement was authorized to act in that capacity.

CERTIFICATE OF AUTHORITY

I, TERRI KALAN, do hereby certify that I am the
(someone other than the person signing the agreement)

CITY CLERK of the CITY OF SUPERIOR
(my position of responsibility within the organization)

and that JIM PAINE,

who signed the agreement on behalf of the CITY OF SUPERIOR

was at the time of signature its MAYOR,
(position held)

and that the person who executed the agreement on behalf of the
CITY OF SUPERIOR acted within his/her statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification

this 3rd day of MARCH, 2020.

Terri Kalan
(Name)

CITY CLERK
(Title)

Bay City Dev Auth Dredge

**DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR DREDGING**

Howards Bay IIS project
Redevelopment Authority
of the City of Superior

Parcels 38030102200, 38030106000, and
38030123100, See Exhibit "A"

The undersigned, hereinafter called the "Owner," hereby grants to the UNITED STATES OF AMERICA, hereinafter called the "Government," a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government, its agents and assigns an irrevocable right to enter upon the lands as depicted in Exhibit "A", at any time from the date of signing thru 31 December 2022, to perform construction work that includes, but is not limited to, removal of material from the bed of the waterway and slips by dredging within the riparian zone of the property and also the placement of structures, depositing material upon the bed of the waterway in the riparian zone of the property, and including without limitation, sand covers and anchors for monitoring buoys.

2. This right-of-entry includes the right of ingress and egress on other lands of the Owner not described below, provided that such ingress and egress is necessary and not otherwise conveniently available to the Government.

3. The Owner acknowledges the benefits from the dredging of the Howards Bay, Hughitt, and Cummings Slips, and it accepts the benefits of the dredging as full compensation for the use of these parcels.

4. The Government shall hold and save the Owner free from all damages arising from the construction, operation, placement of subsurface caps, and dredging in support of the Howards Bay project, including for damages due to the fault of, or negligence by the Government, its assigns, and/or its contractors.

5. All tools, equipment, buildings, improvements, temporary buoy anchors, and other property taken upon or placed upon the land by the Government shall remain the property of the Government and may be removed by the Government at any time within a reasonable period after the expiration of this right-of-entry. The sand covers will remain after the project is completed and will become property of the riparian owner.

6. The parties agree that, if any action of the Government's employees or agents in the exercise of this right-of-entry results in damage to the real property, the Government will, at its option, either repair such damage or make an appropriate settlement with the Owner. In no event shall such repair or settlement exceed the fair market value of the fee interest of the real property at the time immediately preceding such damage. The Government's liability under this clause may not exceed appropriations available for such payment and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The

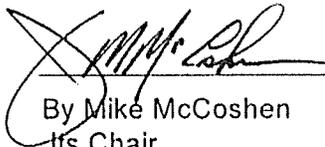
provisions of this clause are without prejudice to any rights the Owner may have to make a claim under applicable laws for any other damages than provided herein. If the Government does acquire such title or other necessary interest, damages would be limited to the decrease in the fair market value of the owner's remainder caused by such damage. The Government's liability for damages, claims, suits, costs, and expenses that arise from the activities of the Government under this Right of Entry shall be governed by the Federal Tort Claims Act, 28 USC 1346(b), and other applicable federal laws.

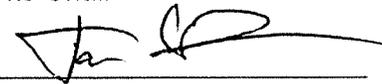
7. The land affected by this permit or right-of-entry is located in the State of Wisconsin, Douglas County, and is shown on the attached Exhibit A.

The land affected by this right-of-entry is located in the County of Douglas, State of Wisconsin, and is described in Exhibit "A":

WITNESSES MY HAND AND SEAL this 27th day of March, 2020

REVELOPMENT AUTHORITY OF THE
CITY OF SUPERIOR, WISCONSIN


By Mike McCoshen
Its Chair


By Jason Serck
Its Executive Director

UNITED STATES OF AMERICA

By: W.M.1516398511
ANDREW SHELTON
Chief, Real Estate
Real Estate Contracting Officer

Digitally signed by
SHELTON.ANDREW.M.151639851
Date: 2020.04.14 09:46:25 -04'00'

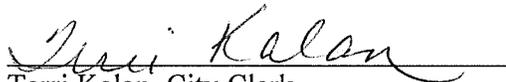
NOTE: THE CERTIFICATE OF AUTHORITY must be executed by an individual other than by the person who signed the agreement. The individual must certify that the official who signed the agreement was authorized to act in that capacity.

CERTIFICATE OF AUTHORITY

I, Terri Kalan, do hereby certify that I am the City Clerk of the City of Superior and that Mike McCoshen and Jason Serck, who signed the agreement on behalf of the Redevelopment Authority of the City of Superior, Wisconsin was at the time of signature its Chair and Executive Director, respectively, that the persons who executed the agreement on behalf of the Redevelopment Authority and acted within their authority.

IN WITNESS WHEREOF, I have made and executed this certification

this 27th day of March, 2020.


Terri Kalan, City Clerk

CHS ROE Dredge

**DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR DREDGING**

Howards Bay IIS project
CHS Inc.

Parcels 48040096400, 48040095600,
and 48040096100 See Exhibit "A"

The undersigned, hereinafter called the "Owner," hereby grants to the UNITED STATES OF AMERICA, hereinafter called the "Government," a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government, its agents and assigns an irrevocable right to enter upon the lands as depicted in Exhibit "A", at any time from the date of signing thru 31 December 2022, to perform construction work that includes, but is not limited to, removal of material from the bed of the waterway and slips by dredging within the riparian zone of the property and also the placement of structures, depositing material upon the bed of the waterway in the riparian zone of the property, and including without limitation, sand covers and anchors for monitoring buoys.

2. This right-of-entry includes the right of ingress and egress on other lands of the Owner not described below, provided that such ingress and egress is necessary and not otherwise conveniently available to the Government.

3. The Owner acknowledges the benefits from the dredging of the Howards Bay, Hughitt, and Cummings Slips, and it accepts the benefits of the dredging as full compensation for the use of these parcels.

4. The Owner shall hold and save the Government free from all damages arising from the construction, operation, placement of subsurface caps, and dredging in support of the Howards Bay project, except for damages due to the fault of, or negligence by the Government, its assigns, and/or its contractors.

5. All tools, equipment, buildings, improvements, temporary buoy anchors, and other property taken upon or placed upon the land by the Government shall remain the property of the Government and may be removed by the Government at any time within a reasonable period after the expiration of this right-of-entry. The sand covers will remain after the project is completed and will become property of the riparian owner.

6. The parties agree that, if any action of the Government's employees or agents in the exercise of this right-of-entry results in damage to the real property, the Government will, at its option, either repair such damage or make an appropriate settlement with the Owner. In no event shall such repair or settlement exceed the fair market value of the fee interest of the real property at the time immediately preceding such damage. The Government's liability under this clause may not exceed appropriations available for such payment and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The

provisions of this clause are without prejudice to any rights the Owner may have to make a claim under applicable laws for any other damages than provided herein. If the Government does acquire such title or other necessary interest, damages would be limited to the decrease in the fair market value of the owner's remainder caused by such damage. The Government's liability for damages, claims, suits, costs, and expenses that arise from the activities of the Government under this Right of Entry shall be governed by the Federal Tort Claims Act, 28 USC 1346(b), and other applicable federal laws.

7. The land affected by this permit or right-of-entry is located in the State of Wisconsin, Douglas County, and is shown on the attached Exhibit A.

The land affected by this right-of-entry is located in the County of Douglas, State of Wisconsin, and is described in Exhibit "A":

WITNESSES MY HAND AND SEAL this 16 day of March, 2020


Signature

Terminal Manager
Title

POC info

UNITED STATES OF AMERICA

By: SHELTON.ANDRE Digitally signed by
W.M.1516398511 SHELTON.ANDREW.M.15163985
Date: 2020.04.14 09:47:36 -04'00'
ANDREW SHELTON
Chief, Real Estate
Real Estate Contracting Officer

NOTE: THE CERTIFICATE OF AUTHORITY must be executed by an individual other than by the person who signed the agreement. The individual must certify that the official who signed the agreement was authorized to act in that capacity.

CERTIFICATE OF AUTHORITY

I, Daniel VanLenthoven, do hereby certify that I am the
(someone other than the person signing the agreement)

Asst. Supt. of the CHS INC
(my position of responsibility within the organization)

and that Richard Gibson,

who signed the agreement on behalf of the CHS INC

was at the time of signature its Terminal Manager,
(position held)

and that the person who executed the agreement on behalf of the

CHS INC. acted within his/her statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification

this 16 day of March, 2020.

Daniel VanLenthoven
(Name)

Assistant Terminal Manager
(Title)

Fraser Upland ROE

**DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR WORK AND STORAGE AREA**

Howards Bay IIS project

Fraser Shipyards Inc. in Superior
Wisconsin. See Exhibit "A"

The undersigned, hereinafter called the "Owner," hereby grants to the UNITED STATES OF AMERICA, hereinafter called the "Government," a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government, its agents and assigns an irrevocable right to enter upon the lands as depicted in Exhibit "A", at any time from the date of signing thru 31 December 2022, to perform construction work that includes, but is not limited to, offload site, work and storage, dredge material treatment and removal, and a temporary drainage pipeline. In support of the remediation of the bottomlands of the Howards Bay Project. See Exhibit "A".

2. This right-of-entry includes the right of ingress and egress on other lands of the Owner not described below, provided that such ingress and egress is necessary and not otherwise conveniently available to the Government.

3. The Owner acknowledges the benefits from the dredging of the Howards Bay, Hughitt, and Cummings Slips, and it accepts the benefits of the dredging as full compensation for the use of this parcel.

4. The Owner shall hold and save the Government free from all damages arising from the construction, use, and dredge material processing in support of the Howards Bay project, except for damages due to the fault of or negligence by the Government, its assigns, and/or its contractors.

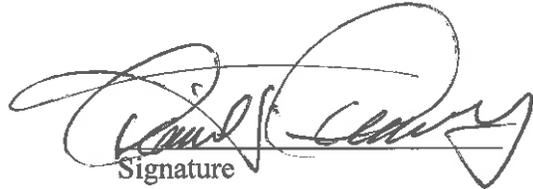
5. All tools, equipment, buildings, improvements, asphalt pad, and other property taken upon or placed upon the land by the Government shall remain the property of the Government and may be removed by the Government at any time within a reasonable period after the expiration of this right-of-entry

6. The parties agree that, if any action of the Government's employees or agents in the exercise of this right-of-entry results in damage to the real property, the Government will, at its option, either repair such damage or make an appropriate settlement with the Owner. In no event shall such repair or settlement exceed the fair market value of the fee interest of the real property at the time immediately preceding such damage. The Government's liability under this clause may not exceed appropriations available for such payment and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The provisions of this clause are without prejudice to any rights the Owner may have to make a claim under applicable laws for any other damages than provided herein. The

Government's liability for damages, claims, suits, costs, and expenses that arise from the activities of the Government under this Right of Entry shall be governed by the Federal Tort Claims Act, 28 USC 1346(b), and other applicable federal laws. If the Government does acquire such title or other necessary interest, damages would be limited to the decrease in the fair market value of the owner's remainder caused by such damage.

7. The land affected by this permit or right-of-entry is located in the State of Wisconsin, Douglas County, and is shown on the attached Exhibit A.

WITNESSES MY HAND AND SEAL this 14th day of April, 2020



Signature

President, COO
Title

UNITED STATES OF AMERICA

SHELTON.ANDR
EW.M.15163985
11

Digitally signed by
SHELTON.ANDR.W.M.15163
98511
Date: 2020.04.20 09:42:09
-04'00'

By: _____
ANDREW SHELTON
Chief, Real Estate
Real Estate Contracting Officer

NOTE: THE CERTIFICATE OF AUTHORITY must be executed by an individual other than by the person who signed the agreement. The individual must certify that the official who signed the agreement was authorized to act in that capacity.

CERTIFICATE OF AUTHORITY

I, Kathy Childs, do hereby certify that I am the
(someone other than the person signing the agreement)

Administrative Assistant of the Fraser Shipyards, Inc.
(my position of responsibility within the organization)

and that Dave Steininger,

who signed the agreement on behalf of the

was at the time of signature its President and COO,
(position held)

and that the person who executed the agreement on behalf of the

Fraser Shipyards, Inc acted within his/her statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification

this 14th day of April, 2020.

Kathy Childs
(Name)

Administrative Assistant
(Title)

Superior Cement ROE

**DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR DREDGING**

Howards Bay IIS project
Duluth Superior Cement

Parcels 48040096402 and
48040095900. See Exhibit "A"

The undersigned, hereinafter called the "Owner," hereby grants to the UNITED STATES OF AMERICA, hereinafter called the "Government," a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government, its agents and assigns an irrevocable right to enter upon the lands as depicted in Exhibit "A", at any time from the date of signing thru 31 December 2022, to perform construction work that includes, but is not limited to, removal of material from the bed of the waterway and slips by dredging within the riparian zone of the property and also the placement of structures, depositing material upon the bed of the waterway in the riparian zone of the property, and including without limitation, sand covers and anchors for monitoring buoys; and also for the removal, storage, and replacement of the owner's docks and support structures during the dredging and related work for Hughitt Slip.
2. This right-of-entry includes the right of ingress and egress on other lands of the Owner not described below, provided that such ingress and egress is necessary and not otherwise conveniently available to the Government.
3. The Owner acknowledges the benefits from the dredging of the Howards Bay, Hughitt, and Cummings Slips, and it accepts the benefits of the dredging as full compensation for the use of these parcels.
4. The Owner shall hold and save the Government free from all damages arising from the construction, operation, placement of subsurface caps, and dredging in support of the Howards Bay project, except for damages due to the fault of, or negligence by the Government, its assigns, and/or its contractors.
5. All tools, equipment, buildings, improvements, temporary buoy anchors, and other property taken upon or placed upon the land by the Government shall remain the property of the Government and may be removed by the Government at any time within a reasonable period after the expiration of this right-of-entry. The sand covers will remain after the project is completed and will become property of the riparian owner.
6. The parties agree that, if any action of the Government's employees or agents in the exercise of this right-of-entry results in damage to the real property, the Government will, at its option, either repair such damage or make an appropriate settlement with the Owner. In no event shall such repair or settlement exceed the fair market value of the fee interest of the real property at the time immediately preceding such damage. The Government's liability under this clause may not exceed appropriations available for such payment and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The

WIDOT ROE Dredge

**DEPARTMENT OF THE ARMY
RIGHT-OF-ENTRY FOR DREDGING**

Howards Bay IIS project
Wisconsin Department of
Transportation

Parcels 038030114500 and
048040095400 and 048040096500,
See Exhibit "A"

The undersigned, hereinafter called the "Owner," hereby grants to the UNITED STATES OF AMERICA, hereinafter called the "Government," a right-of-entry upon the following terms and conditions:

1. The Owner hereby grants to the Government, its agents and assigns an irrevocable right to enter upon the lands as depicted in Exhibit "A", at any time from the date of signing thru 31 December 2022, to perform construction work that includes, but is not limited to, removal of material from the bed of the waterway and slips by dredging within the riparian zone of the property and also the placement of structures, depositing material upon the bed of the waterway in the riparian zone of the property, and including without limitation, sand covers and anchors for monitoring buoys.

2. This right-of-entry includes the right of ingress and egress on other lands of the Owner not described below, provided that such ingress and egress is necessary and not otherwise conveniently available to the Government.

3. The Owner acknowledges the benefits from the dredging of the Howards Bay, Hughitt, and Cummings Slips, and it accepts the benefits of the dredging as full compensation for the use of these parcels.

4. All tools, equipment, buildings, improvements, temporary buoy anchors, and other property taken upon or placed upon the land by the Government shall remain the property of the Government and may be removed by the Government at any time within a reasonable period after the expiration of this right-of-entry. The sand covers will remain after the project is completed and will become property of the riparian owner.

5. The parties agree that, if any action of the Government's employees or agents in the exercise of this right-of-entry results in damage to the real property, the Government will, at its option, either repair such damage or make an appropriate settlement with the Owner. In no event shall such repair or settlement exceed the fair market value of the fee interest of the real property at the time immediately preceding such damage. The Government's liability under this clause may not exceed appropriations available for such payment and nothing contained in this agreement may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The

provisions of this clause are without prejudice to any rights the Owner may have to make a claim under applicable laws for any other damages than provided herein. If the Government does acquire such title or other necessary interest, damages would be limited to the decrease in the fair market value of the owner's remainder caused by such damage. The Government's liability for damages, claims, suits, costs, and expenses that arise from the activities of the Government under this Right of Entry shall be governed by the Federal Tort Claims Act, 28 USC 1346(b), and other applicable federal laws.

6. The land affected by this permit or right-of-entry is located in the State of Wisconsin, Douglas County, and is shown on the attached Exhibit A.

WITNESSES MY HAND AND SEAL this 26 day of March, 2020


Signature

WisDOT Northwest Region Deputy Director
Title

1701 N 4th Street Superior, WI 54880 715-225-9302

POC info

UNITED STATES OF AMERICA

By: SHELTON.ANDRE Digitally signed by
W.M.1516398511 SHELTON.ANDREW.M.15163985
Date: 2020.04.14 09:50:45 -04'00'

ANDREW SHELTON
Chief, Real Estate
Real Estate Contracting Officer

CERTIFICATE OF AUTHORITY

I, Tim Mason, do hereby certify that I am the
(someone other than the person signing the agreement)

SPO Chief of the Wisconsin Department of Transportation
(my position of responsibility within the organization)

Northwest Region and that Jessica Felix,

who signed the agreement on behalf of the Wisconsin Department of Transportation.

was at the time of signature its Deputy Director,
(position held)

and that the person who executed the agreement on behalf of the

Wisconsin Department of Transportation acted within his/her statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification

this 26 day of March, 2020.

Tim Mason
(Name)

SPO Chief
(Title)

Property Search

Enter your search criteria below

i;j Owner Information

Last Name:

First Name:

iii Property Address

Address:

l.ii Parcel ID Form

Parcel ID:

Tax Year 2019:

Property Information

Acres Range

!..ij Land Value Range

Improvement Value Range

!!!! Total Value Range

!!!! Fair Market Value Range

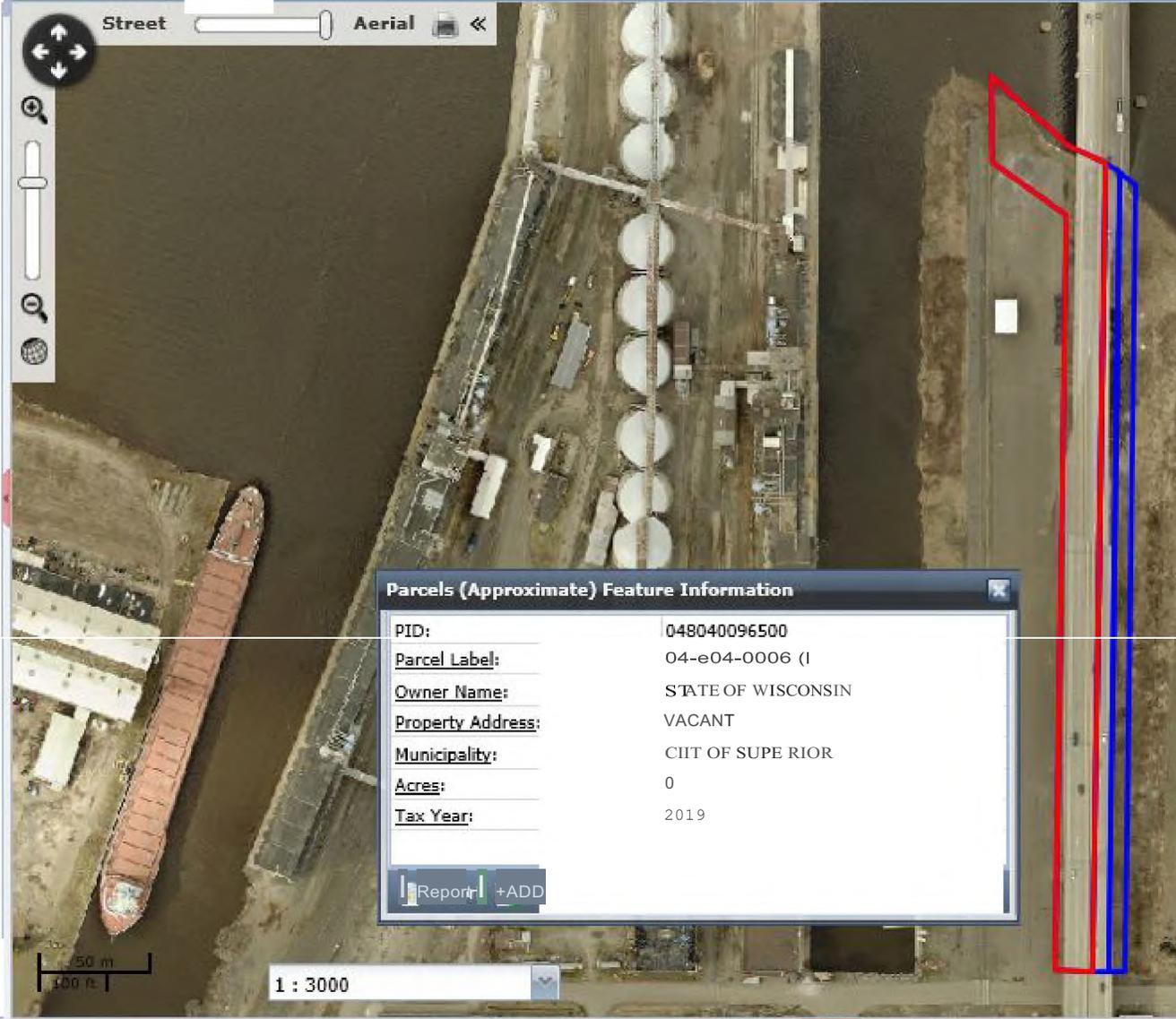
Submit

Address Search

Quick Search

General Map

Property Search



Parcels (Approximate) Feature Information

PID:	048040096500
Parcel Label:	04-e04-0006 (1
Owner Name:	STATE OF WISCONSIN
Property Address:	VACANT
Municipality:	CITY OF SUPERIOR
Acres:	0
Tax Year:	2019

Report +ADD

Parcel Results Query: Parcels (Approximate) (3) Query: Parcels (Approximate) (2) Query: Parcels (Approximate) (2)

Owner - Municipality Acres

04804005400	STATE OF WISCONSIN	CITY OF SUPERIOR	0	2019	04-804-009 >54 -00	VAG-TINT
048040086600	STATE OF WISCONSIN	CITY OF SUPERIOR	0	2019	04-804-00EH'16-00	VAG-AINT

Property Search

Enter your search criteria below

i Owner Information

Last Name:

First Name:

ii Property Address

Address:

iii Tax Information

Parcel ID:

Tax Year 2019:

iv Property Information

i Acres Range

Land Value Range

Improvement Value Range

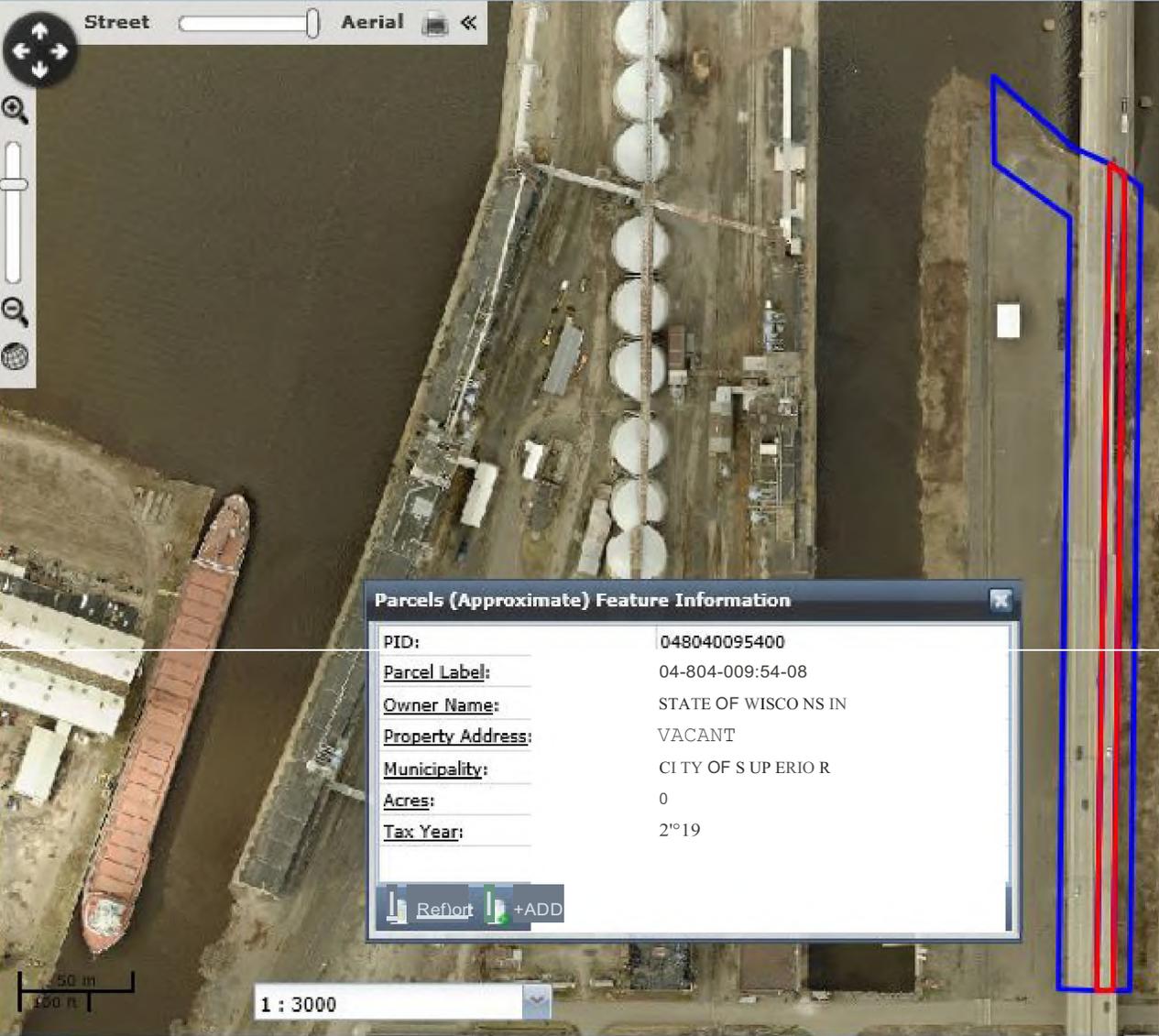
ii Total Value Range

iii Fair Market Value Range

Submit

Clear

General Map | Dept Maps | Property Search



Parcels (Approximate) Feature Information

PID:	048040095400
Parcel Label:	04-804-009:54-08
Owner Name:	STATE OF WISCONSIN
Property Address:	VACANT
Municipality:	CITY OF SUPERIOR
Acres:	0
Tax Year:	2019

Refresh +ADD

Quick Relation

Parcel Results | Query: Parcels (Approximate) (3) | Query: Parcels (Approximate) (2) | Query: Parcels (Approximate) (2)

Select: All None

PID	Owner Name	Municipality	Acres	Tax Year	Parcel Label	Property Address
038030114600	STATE OF WIS...	CITY OF SUPERIOR	0	2019	03-803-01146-00	VACANT
048040095400	STATE OF WIS...	CITY OF SUPERIOR	0	2019	04-804-009:54-08	VACANT
048040095401	STATE OF WIS...	CITY OF SUPERIOR	0	2019	04-804-009:54-08	VACANT

Property Search

Enter your search criteria below

Owner Information

Last Name:

First Name:

Property Address

Address:

Tax Information

Parcel ID:

Tax Year: 2019

Property Information

Acres Range

Land Value Range

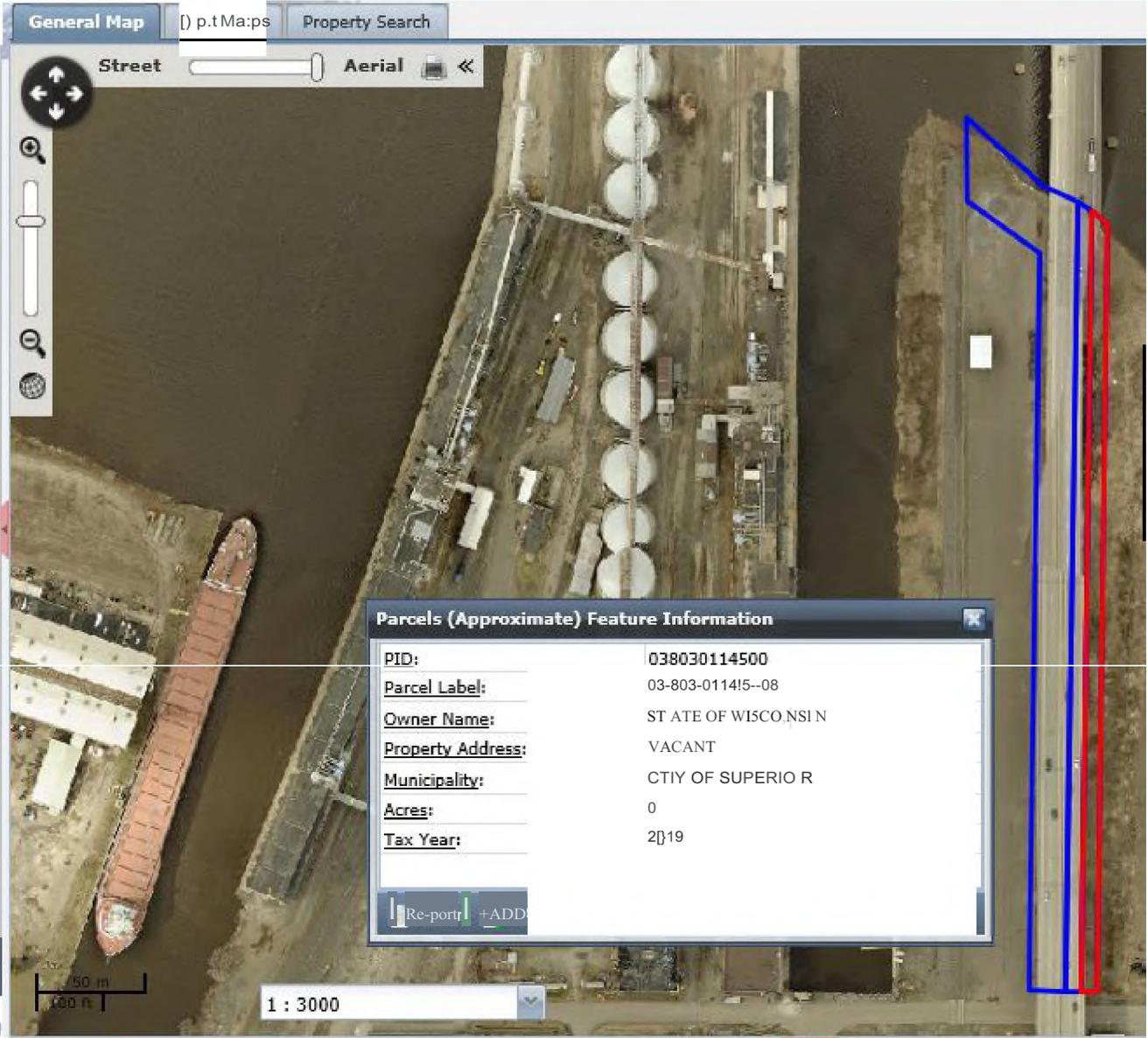
Imperviousment Value Range

Total Value Range

Fair Market Value Range

Address Search

Quick Navigation



Parcels (Approximate) Feature Information

PID: 038030114500

Parcel Label: 03-803-011415--08

Owner Name: STATE OF WISCONSIN

Property Address: VACANT

Municipality: CITY OF SUPERIOR

Acres: 0

Tax Year: 2019

Report +ADD

Parcel Results | Query: Parcels (Approximate) (3) | Query: Parcels (Approximate) (2) | Query: Parcel (Approximate) (2)

Map navigation and legend controls.

PID	Owner Name	Municipality	Acres	Tax Year	Parcel Label	Property Address
0180301141500	STATE OF WIS...	CITY OF SUPE...	0	2019	03-803-011415-00	VACANT
048040095400	STATE OF WIS...	CITY OF SUPE...	0	2019	04-804-001154-00	VACANT
04804000500	STATE OF WIS...	CITY OF SUPE...	0	2019	04-804-001155-00	VACANT

SECTION 01 22 00.00 10

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SINGLE JOB PAYMENT ITEMS

Payment items for the work of this contract for which contract job payments will be made are listed in the BIDDING SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular job or unit price payment item, are included in the listed job item most closely associated with the work involved. The job price and payment made for each item listed constitutes full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.2 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract unit price payments will be made are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed constitutes full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

1.3 BIDDING SCHEDULE

1.3.1 General Conditions Pay Item 0001

1.3.1.1 Payment

Payment will be made for costs associated with labor, equipment, and materials to meet the terms of the General Conditions that are not covered elsewhere, including but not limited to office trailers, sanitary facilities, utilities, bubble curtains for turbidity control, health and safety personnel, PPE, general waste disposal, submittals, cost and schedule tracking, travel/per diem, meetings, and overhead.

1.3.1.2 Unit of Measure

Unit of measure: Job.

1.3.2 Mobilization and Demobilization Pay Item 0002

1.3.2.1 Payment

Payment will be made for costs associated with mobilization and demobilization, as defined in Special Clause PAYMENT FOR MOBILIZATION AND DEMOBILIZATION. Payment for dock removal, storage, and replacement in

accordance with Section 01 35 13.10 SPECIAL PROJECT PROCEDURES will also be made under this item.

1.3.2.2 Unit of Measure

Unit of measure: Job.

1.3.3 Required SND Dredging with Placement at Erie Pier Pay Item 0003

1.3.3.1 Payment

This item shall include all work as specified in SECTION 35 20 23.43 STRATEGIC NAVIGATION DREDGING. The Contract unit price per cubic yard of dredging shall include the cost of removal, conveyance and disposal of all materials as shown on the drawings and as specified herein, except original materials, ledge rock, boulders, cobbles, rock fragments, wrecks, scrap materials, snags, stumps, piles, debris or other material which cannot be removed or buried below the required depth by the plant specified in the accepted bid, or the equivalent of such plant, without blasting or special apparatus. The unit price shall also include the cost of all work required to be performed for the use of the disposal area. Nothing in this paragraph shall be construed as prohibiting the removal of excepted material by special means at the prices agreed and approved in accordance with applicable provisions of the contract. Costs shall also include those associated with placement of dredge material at the placement site as specified in SECTION 35 20 23.43 STRATEGIC NAVIGATION DREDGING.

This item shall also include work as specified in SECTION 35 20 23.13 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SCOW - MONITORING PROFILE. The contract unit price per cubic yard for "Required SND Dredging with Placement at Erie Pier," shall constitute full compensation for labor, equipment, tools, and incidentals necessary to operate and maintain the system as specified herein for the duration of the SND dredging operations.

1.3.3.2 Unit of Measure

Unit of measure: Cubic Yard.

1.3.4 Environmental Dredging Pay Item 0004

1.3.4.1 Payment

This item shall include all work as specified in SECTION 35 20 23.53 ENVIRONMENTAL DREDGING to achieve the target dredge elevations shown on the Drawings. Overdepth to 0.5 foot below the required dredging areas associated with the Base Bid environmental dredging areas shall be paid for at the applicable unit costs for the Base Bid AA and AB items. The Contract unit price per cubic yard of dredging shall include the cost of removal and conveyance to the upland staging area of all materials as shown on the drawings and as specified herein, except rock, boulders, cobbles, rock fragments, wrecks, scrap materials, snags, stumps, piles, debris or other material which cannot be removed or buried below the required depth by the plant specified in the accepted bid, or the equivalent of such plant, without blasting or special apparatus. Nothing in this paragraph shall be construed as prohibiting the removal of excepted material by special means at the prices agreed and approved in accordance with applicable provisions of the contract.

Payment shall be full compensation for all labor, equipment, materials, and incidentals necessary for performing dredging and associated work. Dredging outside of the limits presented on the Drawings, additional dredging not directed by the Contracting Officer, or dredging to compensate for sloughing, caving, or sloping of banks, as necessary, to facilitate removal within the dredging limits shall not be included in the measurement. As such, any anticipated costs for such removal should be included in the bid unit costs.

1.3.4.2 Unit of Measure

Unit of measure: In-Situ Cubic Yard.

1.3.5 Post Removal Sampling Pay Item 0005

1.3.5.1 Payment

This item shall include all labor, equipment, materials, laboratory costs, and incidentals to perform sediment confirmation sampling specified in SECTION 35 20 23.53 ENVIRONMENTAL DREDGING.

1.3.5.2 Unit of Measure

Unit of measure: Job.

1.3.6 Environmental Redredging Pay Item 0006

1.3.6.1 Payment

This item shall include all work to perform redredging based on confirmation sampling results as directed by the Contracting Officer in accordance with the Decision Tree provided in SECTION 35 20 23.53 ENVIRONMENTAL DREDGING. The Contract unit price per cubic yard of redredging shall include the cost of removal and conveyance to the upland staging area of all materials as specified herein, except rock, boulders, cobbles, rock fragments, wrecks, scrap materials, snags, stumps, piles, debris or other material which cannot be removed or buried below the required depth by the plant specified in the accepted bid, or the equivalent of such plant, without blasting or special apparatus. Nothing in this paragraph shall be construed as prohibiting the removal of excepted material by special means at the prices agreed and approved in accordance with applicable provisions of the contract.

Payment shall be full compensation for all labor, equipment, materials, and incidentals necessary for performing redredging directed by the Contracting Officer. Additional dredging not directed by the Contracting Officer based on confirmation sampling results, or dredging to compensate for sloughing, caving, or sloping of banks, as necessary, to facilitate removal within the dredging limits shall not be included in the measurement. As such, any anticipated costs for such removal should be included in the bid cost.

Contractor will not be entitled to adjustment in unit prices as a result of change in estimated quantity under this line item and agrees to accept the unit prices accepted in the Bid as complete and total compensation for additions or deletions caused by changes or alterations of the Work.

1.3.6.2 Unit of Measure

Unit of measure: In-Situ Cubic Yard.

1.3.7 Residual Cover Pay Item 0007

1.3.7.1 Payment

This item shall include labor, equipment, materials, and incidentals to furnish, transport, stockpile (as necessary), and place imported cover fill material over residual impacts as directed by the Contracting Officer based on confirmation sampling and the Decision Tree provided in SECTION 35 20 23.53 ENVIRONMENTAL DREDGING.

Payment shall be based on the unit price per ton as completed on the Base Bid form and shall be full compensation for all labor, equipment, materials, and incidentals necessary for performing residual cover placement. Contractor will not be entitled to adjustment in unit prices as a result of change in estimated quantity under this line item and agrees to accept the unit prices accepted in the Bid as complete and total compensation for additions or deletions caused by changes or alterations of the Work.

1.3.7.2 Unit of Measure

Unit of measure: Ton, as measured on a certified scale.

1.3.8 Site Preparation - Dewatering Area Pay Item 0008

1.3.8.1 Payment

This item shall include preparation, construction, maintenance, and restoration of the upland sediment processing area including:

- a. Upland preconstruction and postconstruction documentation of upland work areas and shoreline structures in accordance with SECTION 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.
- b. Staging area construction and maintenance in accordance with SECTION 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL
- c. Preconstruction and postconstruction sampling beneath support areas in accordance with SECTION 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.
- d. Temporary erosion and sedimentation control installation, maintenance, and removal at the sediment processing area in accordance with SECTION 31 32 11 SOIL SURFACE EROSION CONTROL.
- e. Staging area removal, disposal, and site restoration.

1.3.8.2 Unit of Measure

Unit of measure: Job.

1.3.9 Enhanced Natural Recovery Cover Pay Item 0009

1.3.9.1 Payment

This item shall include labor, equipment, materials, and incidentals to furnish, transport, stockpile (as necessary), and place imported cover fill material required to install the Enhanced Natural Recovery sediment cover in accordance with plans and specifications. Payment shall be based on the unit price per ton as completed on the Base Bid form and shall be full

compensation for all labor, equipment, materials, and incidentals necessary for performing Enhanced Natural Recovery cover placement.

1.3.9.2 Unit of Measure

Unit of measure: Ton, as measured on a certified scale.

1.3.10 Road Repair and Landfill Redevelopment Pay Item 0010

1.3.10.1 Payment

This item shall include all work associated road repair and landfill redevelopment costs including:

- a. Labor, materials, equipment, and incidentals for completion of preconstruction and postconstruction documentation of public roads in accordance with SECTION 01 35 13.10 SPECIAL PROJECT PROCEDURES.
- b. Furnish materials for Site furnishings (shelter and benches) at Wisconsin Point Landfill in accordance with SECTION SITE FURNISHINGS.
- c. Labor, material, equipment, and incidentals for repairing Wisconsin Point Road (at least 0.7 miles) as necessary in accordance with SECTION 01 35 13.10 SPECIAL PROJECT PROCEDURES.
- d. Furnish 2150 tons of WISDOT 4 LT 58-34 S hot mix asphalt for replacement/repairs of Moccasin Mike Road (at least 1.3 miles). Replacement/repairs of Moccasin Mike Road will be performed by the City of Superior.

1.3.10.2 Unit of Measure

Unit of measure: Job.

1.3.11 Wisconsin Point Landfill Placement Area Preparation Pay Item 0011

1.3.11.1 Payment

This item shall include preparation of the placement area at Wisconsin Point Landfill including:

- a. Upland preconstruction and postconstruction documentation of placement areas in accordance with SECTION 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.
- b. Temporary erosion and sedimentation control installation, maintenance, and removal at the sediment processing area in accordance with SECTION 31 32 11 SOIL SURFACE EROSION CONTROL.

Payment for this item will be full compensation for all labor, equipment, materials, and incidentals necessary for performing this item of the Work but not specifically included in other pay items.

1.3.11.2 Unit of Measure

Unit of measure: Job.

1.3.12 Transportation of Environmental Dredge Material To Wisconsin Point Landfill Pay Item 0012

1.3.12.1 Payment

This item includes all labor, equipment, and materials to load and transport dewatered dredged sediments from the dewatering area to Wisconsin Point Landfill in accordance with SECTION 02 61 14 TRANSPORTATION AND DISPOSAL OF

CONTAMINATED MATERIALS. Payment shall be at the unit price indicated on the Base Bid form paid per cubic yard of in-place dredged sediment installed at Wisconsin Point Landfill.

1.3.12.2 Unit of Measure

Unit of measure: Placed Cubic Yards.

1.3.13 Disposal of Environmental Dredge Material At Wisconsin Point Landfill
Pay Item 0013

1.3.13.1 Payment

This item shall include all labor, equipment, materials, and supplies necessary to place environmental dredge materials at Wisconsin Point Landfill in accordance with the Drawings and Section 02 66 00 SELECT FILL AND TOPSOIL FOR LANDFILL COVER. Payment shall be at the unit price indicated on the Base Bid form paid per cubic yard of in-place dredged sediment installed at Wisconsin Point Landfill.

Contractor will not be entitled to adjustment in unit prices as a result of change in estimated quantity under this line item and agrees to accept the unit prices accepted in the Bid as complete and total compensation for additions or deletions caused by changes or alterations of the Work.

1.3.13.2 Unit of Measure

Unit of measure: Placed Cubic Yard.

1.3.14 Erie Pier Material Placement Pay Item 0014

1.3.14.1 Payment

This item shall include all labor, equipment, materials, and supplies necessary to amend, load, transport, and place Erie Pier Borrow Material at Wisconsin Point Landfill in accordance with the Drawings and Section 02 66 00 SELECT FILL AND TOPSOIL FOR LANDFILL COVER. Payment shall be at the unit price indicated on the Base Bid form paid per in-place cubic yard of Erie Pier Borrow Material installed at Wisconsin Point Landfill.

1.3.14.2 Unit of Measure

Unit of measure: Placed Cubic Yard.

1.3.15 Topsoil and Seeding Pay Item 0015

1.3.15.1 Payment

This item shall include all labor, equipment, materials, supplies, and transport activities required to:

- a. Furnish and install imported top soil cover at Wisconsin Point Landfill in accordance with the Drawings and SECTION 02 66 00 SELECT FILL AND TOPSOIL FOR LANDFILL COVER.
- b. Furnish and install seeding and mulch at Wisconsin Point Landfill in accordance with the Drawings and SECTION 31 32 11 SOIL SURFACE EROSION CONTROL.

- c. Furnish and install diversion swale and rip rap apron at Wisconsin Point Landfill in accordance with the Drawings.
- d. Maintain seeded areas until adequate vegetative cover is established.

This pay item also includes all required material testing and certifications, and all other associated work and expenses incidental thereto, for which payment is not provided under other items.

Contractor will not be entitled to adjustment in unit prices as a result of change in estimated quantity under this line item and agrees to accept the unit prices accepted in the Bid as complete and total compensation for additions or deletions caused by changes or alterations of the Work.

1.3.15.2 Unit of Measure

Unit of measure: Job.

1.3.16 Erie Pier Regrading Pay Item 0016

1.3.16.1 Payment

This item shall include all labor, equipment, materials, and incidentals required to stockpile fine materials from Erie Pier for use at Wisconsin Point Landfill and to regrade Erie Pier when stockpiling is complete. Contractor will not be entitled to adjustment in unit prices as a result of change in estimated quantity under this line item and agrees to accept the unit prices accepted in the Bid as complete and total compensation for additions or deletions caused by changes or alterations of the Work.

1.3.16.2 Unit of Measure

Unit of measure: Acres.

1.3.17 Water Treatment Pay Item 0017

1.3.17.1 Payment

This item shall include all labor, equipment, materials, and supplies necessary to collect and treat construction water as required to complete the sediment cleanup dredging in accordance with the plans and specifications. Construction water includes liquids from scows, sumps, staging areas, precipitation events and other sources of water that contacts impacted sediment. Item shall include costs to design, install, operate, and maintain (including media changeout) the onsite water treatment system and all associated equipment to treat construction water in accordance with SECTION 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Item shall also include costs to decontaminate and demobilize onsite treatment system components at the completion of work and the required waste characterization, manifesting, and disposal of the spent media from the treatment system.

1.3.17.2 Unit of Measure

Unit of measure: Month.

1.3.18 Sediment Dewatering/Solidification Item 0018

1.3.18.1 Payment

This item shall include all labor, equipment, materials, and supplies necessary to procure and blend solidification agent with dredged sediment in accordance with SECTION 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Payment shall be at the unit price as completed on the bid form for each ton of solidification agent used for sediment solidification in accordance with the specifications.

Contractor will not be entitled to adjustment in unit prices as a result of change in estimated quantity under this line item and agrees to accept the unit prices accepted in the bid as complete and total compensation for additions or deletions caused by changes or alterations of the Work.

1.3.18.2 Unit of Measure

Unit of measure: Ton

1.3.19 Sediment Trucking to TSD Facility Pay Item 0019

1.3.19.1 Payment

This item shall include all labor, equipment, materials, expenses, and incidentals necessary to load and transport dewatered/solidified sediment to an approved TSD facility in accordance with Section 02 61 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL. Payment shall be at the unit price as completed on the bid form based on receipt of certified weight scale tickets and copies of manifest signed by the disposal facility.

Contractor will not be entitled to adjustment in unit prices as a result of change in estimated quantity under this line item and agrees to accept the unit prices accepted in the bid as complete and total compensation for additions or deletions caused by changes or alterations of the Work.

1.3.19.2 Unit of Measure

Unit of measure: Tons.

1.3.20 Sediment Disposal at TSD Facility Pay Item 0020

1.3.20.1 Payment

This item shall include all expenses and incidentals to dispose of dewatered/solidified sediment at an approved TSD facility in accordance with Section 02 61 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL. Payment shall be at the unit price as completed on the bid form based on receipt of certified weight scale tickets and copies of manifest signed by the disposal facility.

Contractor will not be entitled to adjustment in unit prices as a result of change in estimated quantity under this line item and agrees to accept the unit prices accepted in the Bid as complete and total compensation for additions or deletions caused by changes or alterations of the Work.

1.3.20.2 Unit of Measure

Unit of measure: Ton.

1.3.21 Debris Trucking to TSD Facility Pay Item 0021

1.3.21.1 Payment

This item shall include all labor, equipment, materials, expenses, and incidentals necessary to separate debris from dredged sediments, size debris (as necessary), manage debris prior to offsite disposal, load debris into appropriate trucks, and transport material to an approved TSD facility in accordance with Section 02 61 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL. Payment shall be at the unit price as completed on the bid form based on receipt of certified weight scale tickets and copies of manifest signed by the disposal facility.

Contractor will not be entitled to adjustment in unit prices as a result of change in estimated quantity under this line item and agrees to accept the unit prices accepted in the bid as complete and total compensation for additions or deletions caused by changes or alterations of the Work.

1.3.21.2 Unit of Measure

Unit of measure: Ton.

1.3.22 Debris Disposal at TSD Facility Pay Item 0022

1.3.22.1 Payment

This item shall include all expenses and incidentals to dispose of debris at an approved TSD facility in accordance with Section 02 61 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL. Payment shall be at the unit price as completed on the bid form based on receipt of certified weight scale tickets and copies of manifest signed by the disposal facility.

Contractor will not be entitled to adjustment in unit prices as a result of change in estimated quantity under this line item and agrees to accept the unit prices accepted in the Bid as complete and total compensation for additions or deletions caused by changes or alterations of the Work.

1.3.22.2 Unit of Measure

Unit of measure: Ton.

1.3.23 Air Monitoring Pay Item 0023

1.3.23.1 Payment

This item shall include all labor, equipment, materials, and incidentals, necessary to perform community air monitoring in accordance with SECTION 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. Payment shall be at the unit price on the bid form for each month of community air monitoring performed as documented by monitoring reports completed in accordance with the specifications.

1.3.23.2 Unit of Measure

Unit of measure: Month.

1.3.24 Turbidity Monitoring Pay Item 0024

Howards Bay SND and GLLA Dredging
AS AWARDED

1.3.24.1 Payment

This item shall include all labor, equipment, materials, and incidentals, necessary to perform turbidity monitoring in accordance with Section 35 20 23.53 ENVIRONMENTAL DREDGING. Payment shall be at the unit price on the bid form for each week of monitoring performed as documented in reports completed in accordance with the specifications.

1.3.24.2 Unit of Measure

Unit of measure: Week.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 32 01.00 10

PROJECT SCHEDULE

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AACE INTERNATIONAL (AACE)

AACE 29R-03 (2011) Forensic Schedule Analysis

AACE 52R-06 (2006) Time Impact Analysis - As Applied in Construction

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11 (2017) Administration - Project Schedules

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Project Scheduler Qualifications; G-AOF
Preliminary Project Schedule; G-AOF
Initial Project Schedule; G-AOF
Periodic Schedule Update; G-AOF

1.3 PROJECT SCHEDULER QUALIFICATIONS

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The authorized representative must have a minimum of 2-years experience scheduling construction projects similar in size and nature to this project with scheduling software that meets the requirements of this specification. Representative must have a comprehensive knowledge of CPM scheduling principles and application.

PART 2 PRODUCTS

2.1 SOFTWARE

The scheduling software utilized to produce and update the schedules required herein must be capable of meeting all requirements of this specification.

2.1.1 Default Software

The Contracting Officer intends to use Primavera P6.

2.1.2 Contractor Software

Scheduling software used by the contractor must be commercially available from the software vendor for purchase with vendor software support agreements available. The software routine used to create the required Standard Data Exchange Format (sdef) file must be created and supported by the software manufacturer.

2.1.2.1 Primavera

If Primavera P6 is selected for use, provide the "xer" export file in a version of P6 importable by the Government system.

2.1.2.2 Other Than Primavera

If the contractor chooses software other than Primavera P6, that is compliant with this specification, provide for the Government's use two licenses, two computers, and training for two Government employees in the use of the software. These computers will be stand-alone and not connected to Government network. Computers and licenses will be returned at project completion.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to Clause 52.236-15 Schedules For Construction Contracts. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of construction is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Subcontractors and suppliers working on the project must also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool. Use the Critical Path Method (CPM) of network calculation to generate all Project Schedules. Prepare each Project Schedule using the Precedence Diagram Method (PDM).

3.2 BASIS FOR PAYMENT AND COST LOADING

The schedule is the basis for determining contract earnings during each update period and therefore the amount of each progress payment. The aggregate value of all activities coded to a contract CLIN must equal the value of the CLIN.

3.2.1 Activity Cost Loading

Activity cost loading must be reasonable and without front-end loading. Provide additional documentation to demonstrate reasonableness if requested by the Contracting Officer.

3.2.2 Withholdings / Payment Rejection

Failure to meet the requirements of this specification may result in the disapproval of the preliminary, initial or periodic schedule updates and subsequent rejection of payment requests until compliance is met.

In the event that the Contracting Officer directs schedule revisions and those revisions have not been included in subsequent Project Schedule revisions or updates, the Contracting Officer may withhold 10 percent of pay request amount from each payment period until such revisions to the project schedule have been made.

3.3 PROJECT SCHEDULE DETAILED REQUIREMENTS

3.3.1 Level of Detail Required

Develop the Project Schedule to the appropriate level of detail to address major milestones and to allow for satisfactory project planning and execution. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

3.3.2 Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities may have Original Durations (OD) greater than 20 work days or 30 calendar days.

3.3.3 Procurement Activities

Include activities associated with the critical submittals and their approvals, procurement, fabrication, and delivery of long lead materials, equipment, fabricated assemblies, and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days.

3.3.4 Mandatory Tasks

Include the following activities/tasks in the initial project schedule and all updates.

- a. Submission, review and acceptance of SD-01 Preconstruction Submittals (individual activity for each).
- b. Long procurement activities
- c. Submission and approval of as-built drawings.
- d. Contractor's pre-final inspection.
- e. Correction of punch list from Contractor's pre-final inspection.
- f. Government's pre-final inspection.
- g. Correction of punch list from Government's pre-final inspection.

h. Final inspection.

3.3.5 Government Activities

Show Government and other agency activities that could impact progress. These activities include, but are not limited to: approvals, environmental permit approvals by State regulators, inspections and Notice to Proceed (NTP) for phasing requirements.

3.3.6 Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11. This exact structure is mandatory. Develop and assign all Activity Codes to activities as detailed herein. A template SDEF compatible schedule backup file is available on the QCS web site: <http://rms.usace.army.mil>.

The SDEF format is as follows:

Field	Activity Code	Length	Description
1	WRKP	3	Workers per day
2	RESP	4	Responsible party
3	AREA	4	Area of work
4	MODF	6	Modification Number
5	BIDI	6	Bid Item (CLIN)
6	PHAS	2	Phase of work
7	CATW	1	Category of work
8	FOW	20	Feature of work*
<p>*Some systems require that FEATURE OF WORK values be placed in several activity code fields. The notation shown is for Primavera P6. Refer to the specific software guidelines with respect to the FEATURE OF WORK field requirements.</p>			

3.3.6.1 Workers Per Day (WRKP)

Assign Workers per Day for all field construction or direct work activities, if directed by the Contracting Officer. Workers per day is based on the average number of workers expected each day to perform a task for the duration of that activity.

3.3.6.2 Responsible Party Coding (RESP)

Assign responsibility code for all activities to the Prime Contractor, Subcontractor(s) or Government agency(ies) responsible for performing the activity.

- a. Activities coded with a Government Responsibility code include, but are not limited to: Government approvals, Government design reviews, environmental permit approvals by State regulators, Government Furnished Property/Equipment (GFP) and Notice to Proceed (NTP) for phasing requirements.
- b. Activities cannot have more than one Responsibility Code. Examples of acceptable activity code values are: DOR (for the designer of record); ELEC (for the electrical subcontractor); MECH (for the mechanical subcontractor); and GOVT (for USACE).

3.3.6.3 Area of Work Coding (AREA)

Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities cannot have more than one Work Area Code.

Not all activities are required to be Work Area coded. A lack of Work Area coding indicates the activity is not resource or space constrained.

3.3.6.4 Modification Number (MODF)

Assign a Modification Number Code to any activity or sequence of activities added to the schedule as a result of a Contract Modification, when approved by Contracting Officer. Key all Code values to the Government's modification numbering system. An activity can have only one Modification Number Code.

3.3.6.5 Bid Item Coding (BIDI)

Assign a Bid Item Code to all activities using the Contract Line Item Schedule (CLIN) to which the activity belongs, even when an activity is not cost loaded. An activity can have only one BIDI Code.

3.3.6.6 Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities. Examples of phase of work are procurement phase and construction phase. Each activity can have only one Phase of Work code.

- a. Code proposed fast track design and construction phases proposed to allow filtering and organizing the schedule by fast track design and construction packages.
- b. If the contract specifies phasing with separately defined performance periods, identify a Phase Code to allow filtering and organizing the schedule accordingly.

3.3.6.7 Category of Work Coding (CATW)

Assign a Category of Work Code to all activities. Category of Work Codes include, but are not limited to construction submittal, procurement, fabrication, weather sensitive installation, non-weather sensitive installation, start-up, and testing activities. Each activity can have no more than one Category of Work Code.

3.3.6.8 Feature of Work Coding (FOW)

Assign a Feature of Work Code to appropriate activities based on the Definable Feature of Work to which the activity belongs based on the approved QC plan.

Definable Feature of Work is defined in Section 01 45 00.00 10 QUALITY CONTROL. An activity can have only one Feature of Work Code.

3.3.7 Contract Milestones and Constraints

Milestone activities are to be used for significant project events including, but not limited to, project phasing, project start and end activities, or interim completion dates. The use of artificial float constraints such as "zero free float" or "zero total float" are prohibited.

Mandatory constraints that ignore or effect network logic are prohibited. No constrained dates are allowed in the schedule other than those specified herein. Submit additional constraints to the Contracting Officer for approval on a case by case basis.

3.3.7.1 Project Start Date Milestone and Constraint

The first activity in the project schedule must be a start milestone titled "NTP Acknowledged," which must have a "Start On" constraint date equal to the date that the NTP is acknowledged.

3.3.7.2 End Project Finish Milestone and Constraint

The last activity in the schedule must be a finish milestone titled "End Project."

Constrain the project schedule to the Contract Completion Date in such a way that if the schedule calculates an early finish, then the float calculation for "End Project" milestone reflects positive float on the longest path. If the project schedule calculates a late finish, then the "End Project" milestone float calculation reflects negative float on the longest path. The Government is under no obligation to accelerate Government activities to support a Contractor's early completion.

3.3.7.3 Interim Completion Dates and Constraints

Constrain contractually specified interim completion dates to show negative float when the calculated late finish date of the last activity in that phase is later than the specified interim completion date.

3.3.7.3.1 Start Phase

Use a start milestone as the first activity for a project phase. Call the start milestone "Start Phase X" where "X" refers to the phase of work.

3.3.7.3.2 End Phase

Use a finish milestone as the last activity for a project phase. Call the finish milestone "End Phase X" where "X" refers to the phase of work.

3.3.8 Calendars

Schedule activities on a Calendar to which the activity logically belongs. Develop calendars to accommodate any contract defined work period such as a 7-day calendar for Government Acceptance activities, concrete cure times, etc. Develop the default Calendar to match the physical work plan with non-work periods identified including weekends and holidays. Develop Seasonal Calendar(s) and assign to seasonally affected activities as applicable.

If an activity is weather sensitive it should be assigned to a calendar showing non-work days on a monthly basis, with the non-work days selected at random across the weeks of the calendar, using the anticipated days provided in the contract clause TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER. Assign non-work days over a seven-day week as weather records are compiled on seven-day weeks, which may cause some of the weather related non-work days to fall on weekends.

3.3.9 Open Ended Logic

Only two open ended activities are allowed: the first activity "NTP Acknowledged" may have no predecessor logic, and the last activity -"End Project" may have no successor logic.

Predecessor open ended logic may be allowed in a time impact analyses upon the Contracting Officer's approval.

3.3.10 Default Progress Data Disallowed

Actual Start and Finish dates must not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity must be independent functions. Disable program features that calculate one of these parameters from the other. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process must match those dates provided in the Contractor Quality Control Reports. Failure to document the AS and AF dates in the Daily Quality Control report will result in disapproval of the Contractor's schedule.

3.3.11 Out-of-Sequence Progress

Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate out of sequence progress or justify not changing the sequencing for

approval prior to submitting an updated project schedule. Address out of sequence progress or logic changes in the Narrative Report.

3.3.12 Added and Deleted Activities

Do not delete activities from the project schedule or add new activities to the schedule without approval from the Contracting Officer. Activity ID and description changes are considered new activities and cannot be changed without Contracting Officer approval.

3.3.13 Original Durations

Activity Original Durations (OD) must be reasonable to perform the work item. OD changes are prohibited unless justification is provided and approved by the Contracting Officer.

3.3.14 Leads, Lags, and Start to Finish Relationships

Lags must be reasonable as determined by the Government and not used in place of realistic original durations, must not be in place to artificially absorb float, or to replace proper schedule logic.

- a. Leads (negative lags) are prohibited.
- b. Start to Finish (SF) relationships are prohibited.

3.3.15 Retained Logic

Schedule calculations must retain the logic between predecessors and successors ("retained logic" mode) even when the successor activity(s) starts and the predecessor activity(s) has not finished (out-of-sequence progress). Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") are not be allowed.

3.3.16 Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete to allow for proper schedule management.

3.3.17 Remaining Duration

Update the remaining duration for each activity based on the number of estimated work days it will take to complete the activity. Remaining duration may not mathematically correlate with percentage found under paragraph entitled Percent Complete.

3.3.18 Cost Loading of Closeout Activities

Cost load the "Correction of punch list from Government pre-final inspection" activity(ies) not less than 1 percent of the present contract value. Activity(ies) may be declared 100 percent complete upon the Government's verification of completion and correction of all punch list work identified during Government pre-final inspection(s).

3.3.18.1 As-Built Drawings

If there is no separate contract line item (CLIN) for as-built drawings, cost load the "Submission and approval of as-built drawings" activity not less than \$35,000 or 1 percent of the present contract value, whichever is greater, up to \$200,000. Activity will be declared 100 percent complete upon the Government's approval.

3.3.19 Anticipated Adverse Weather

Paragraph applicable to contracts with clause titled TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER. Reflect the number of anticipated adverse weather delays allocated to a weather sensitive activity in the activity's calendar.

3.3.20 Early Completion Schedule and the Right to Finish Early

An Early Completion Schedule is an Initial Project Schedule (IPS) that indicates all scope of the required contract work will be completed before the contractually required completion date.

- a. No IPS indicating an Early Completion will be accepted without being fully resource-loaded (including crew sizes and manhours) and the Government agreeing that the schedule is reasonable and achievable.
- b. The Government is under no obligation to accelerate work items it is responsible for to ensure that the early completion is met nor is it responsible to modify incremental funding (if applicable) for the project to meet the contractor's accelerated work.

3.4 PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. The data CD/DVD, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS. If the Contractor fails or refuses to furnish the information and schedule updates as set forth herein, then the Contractor will be deemed not to have provided an estimate upon which a progress payment can be made.

Review comments made by the Government on the schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents.

3.4.1 Preliminary Project Schedule Submission

Within 15 calendar days after the NTP is acknowledged submit the Preliminary Project Schedule defining the planned operations detailed for the first 90 calendar days for approval. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary Project Schedule to balance the contract award CLINS shown on the Price Schedule. The Preliminary Project Schedule may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must include all of the required plan and program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, planned submissions of all early design

packages, permitting activities, design review conference activities, and other non-construction activities intended to occur within the first 90 calendar days. Government acceptance of the associated design package(s) and all other specified Program and Plan approvals must occur prior to any planned construction activities. Activity code any activities that are summary in nature after the first 90 calendar days with Bid Item (CLIN) code (BIDI), Responsibility Code (RESP) and Feature of Work code (FOW).

3.4.2 Initial Project Schedule Submission

Submit the Initial Project Schedule for approval within 42 calendar days after notice to proceed is issued. The schedule must demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. No payment will be made for work items not fully detailed in the Project Schedule.

3.4.3 Periodic Schedule Updates

Update the Project Schedule on a regular basis, monthly at a minimum. Provide a draft Periodic Schedule Update for review. These updates will enable the Government to assess Contractor's progress.

- a. Update information including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete is subject to the approval of the Government.
- b. AS and AF dates must match the date(s) reported on the Contractor's Quality Control Report for an activity start or finish.

3.5 SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:

3.5.1 Data CD/DVDs

Provide two sets of data CD/DVDs containing the current project schedule and all previously submitted schedules in the format of the scheduling software (e.g. .xer). Also include on the data CD/DVDs the Narrative Report and all required Schedule Reports. Label each CD/DVD indicating the type of schedule (Preliminary, Initial, Update), full contract number, Data Date and file name. Each schedule must have a unique file name and use project specific settings.

3.5.2 Narrative Report

Provide a Narrative Report with each schedule submission. The Narrative Report is expected to communicate to the Government the thorough analysis of the schedule output and the plans to compensate for any problems, either current or potential, which are revealed through that analysis. Include the following information as minimum in the Narrative Report:

- a. Identify and discuss the work scheduled to start in the next update period.
- b. A description of activities along the two most critical paths where the total float is less than or equal to 20 work days.

- c. A description of current and anticipated problem areas or delaying factors and their impact and an explanation of corrective actions taken or required to be taken.
- d. Identify and explain why activities based on their calculated late dates should have either started or finished during the update period but did not.
- e. Identify and discuss all schedule changes by activity ID and activity name including what specifically was changed and why the change was needed. Include at a minimum new and deleted activities, logic changes, duration changes, calendar changes, lag changes, resource changes, and actual start and finish date changes.
- f. Identify and discuss out-of-sequence work.

3.5.3 Schedule Reports

The format, filtering, organizing and sorting for each schedule report will be as directed by the Contracting Officer. Typically, reports contain Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. Provide the reports electronically in .pdf format. The following lists typical reports that will be requested:

3.5.3.1 Activity Report

List of all activities sorted according to activity number.

3.5.3.2 Logic Report

List of detailed predecessor and successor activities for every activity in ascending order by activity number.

3.5.3.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. List activities which have the same amount of total float in ascending order of Early Start Dates. Do not show completed activities on this report.

3.5.3.4 Earnings Report by CLIN

A compilation of the Total Earnings on the project from the NTP to the data date, which reflects the earnings of activities based on the agreements made at monthly pay estimate review meetings. Provided a complete schedule update has been furnished, this report serves as the basis of determining progress payments. Group activities by CLIN number and sort by activity number. Provide a total CLIN percent earned value, CLIN percent complete, and project percent complete. The printed report must contain the following for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Earnings to Date, Earnings this period, Total Quantity, Quantity to Date, and Percent Complete (based on cost).

3.5.3.5 Schedule Log

Provide a Scheduling/Leveling Report generated from the current project schedule being submitted.

3.5.4 Network Diagram

The Network Diagram is required for the Preliminary, Initial and Periodic Updates. Depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.4.1 Continuous Flow

Show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, duration, and estimated earned value on the diagram.

3.5.4.2 Project Milestone Dates

Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.4.3 Critical Path

Show all activities on the critical path. The critical path is defined as the longest path.

3.5.4.4 Banding

Organize activities using the WBS or as otherwise directed to assist in the understanding of the activity sequence. Typically, this flow will group activities by major elements of work, category of work, work area and/or responsibility.

3.5.4.5 Cash Flow / Schedule Variance Control (SVC) Diagram

With each schedule submission, provide a SVC diagram showing 1) Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates, and 2) Earned Value to-date.

3.6 WEEKLY PROGRESS MEETINGS

Conduct a weekly meeting with the Contracting Officer (or as otherwise mutually agreed to) for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress and to review planned activities for the upcoming four weeks. Use the current approved schedule update for the purposes of this meeting and for the production and review of reports. At the weekly progress meeting, address the status of RFIs, RFPs and Submittals.

3.7 REQUESTS FOR TIME EXTENSIONS

Provide a justification of delay to the Contracting Officer in accordance with the contract provisions and clauses for approval before a delay occurs. Also prepare a time impact analysis for each Government request for proposal (RFP) to justify time extensions.

3.7.1 Justification of Delay

Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify all schedule activities impacted. Show that the event that caused the delay/impact was the responsibility of the Government. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion date(s). Evaluate multiple impacts chronologically; each with its own justification of delay. With multiple impacts consider any concurrency of delay. A time extension and the schedule fragnet becomes part of the project schedule and all future schedule updates upon approval by the Contracting Officer.

3.7.2 Time Impact Analysis (Prospective Analysis)

Prepare a time impact analysis for approval by the Contracting Officer based on industry standard AACE 52R-06. Utilize a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis. If Contracting Officer determines the time frame between the last approved schedule and the first day of impact is too great, prepare an interim updated schedule to perform the time impact analysis. Unless approved by the Contracting Officer, no other changes may be incorporated into the schedule being used to justify the time impact.

3.7.3 Forensic Schedule Analysis (Retrospective Analysis)

Prepare an analysis for approval by the Contracting Officer based on industry standard AACE 29R-03.

3.7.4 Fragmentary Network (Fragnet)

Prepare a proposed fragnet for time impact analysis consisting of a sequence of new activities that are proposed to be added to the project schedule to demonstrate the influence of the delay or impact to the project's contractual dates. Clearly show how the proposed fragnet is to be tied into the project schedule including all predecessors and successors to the fragnet activities. The proposed fragnet must be approved by the Contracting Officer prior to incorporation into the project schedule.

3.7.5 Time Extension

The Contracting Officer must approve the Justification of Delay including the time impact analysis before a time extension will be granted. No time extension will be granted unless the delay consumes all available Project Float and extends the projected finish date ("End Project" milestone) beyond the Contract Completion Date. The time extension will be in calendar days.

Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.7.6 Impact to Early Completion Schedule

No extended overhead will be paid for delay prior to the original Contract Completion Date for an Early Completion IPS unless the Contractor actually performed work in accordance with an Early Completion Schedule approved by

the Contracting Officer. The Contractor must show that an early completion was achievable had it not been for the impact.

3.8 FAILURE TO ACHIEVE PROGRESS

Should the progress fall behind the approved project schedule for reasons other than those that are excusable within the terms of the contract, the Contracting Officer may require provision of a written recovery plan for approval. The plan must detail how progress will be made-up to include which activities will be accelerated by adding additional crews, longer work hours, extra work days, etc.

3.8.1 Artificially Improving Progress

Artificially improving progress by means such as, but not limited to, revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule is prohibited. Indicate assumptions made and the basis for any logic, constraint, duration and calendar changes used in the creation of the recovery plan. Any additional resources, manpower, or daily and weekly work hour changes proposed in the recovery plan must be evident at the work site and documented in the daily report along with the Schedule Narrative Report.

3.8.2 Failure to Perform

Failure to perform work and maintain progress may result in an interim and final unsatisfactory performance rating and/or may result in corrective action directed by the Contracting Officer pursuant to Clause 52.236-15 Schedules for Construction Contracts, Clause 52.249-10 Default (Fixed-Price Construction), and other contract provisions.

3.8.3 Recovery Schedule

Should the Contracting Officer find it necessary, submit a recovery schedule pursuant to Clause 52.236-15 Schedules for Construction Contracts.

3.9 OWNERSHIP OF FLOAT

Except for the provision given in the paragraph IMPACT TO EARLY COMPLETION SCHEDULE, float available in the schedule, at any time, may not be considered for the exclusive use of either the Government or the Contractor including activity and/or project float. Activity float is the number of work days that an activity can be delayed without causing a delay to the "End Project" finish milestone. Project float (if applicable) is the number of work days between the projected early finish and the contract completion date milestone.

3.10 TRANSFER OF SCHEDULE DATA INTO RMS/QCS

Import the schedule data into the Quality Control System (QCS) and export the QCS data to the Government. This data is considered to be additional supporting data in a form and detail required by the Contracting Officer pursuant to FAR 52.232-5 - Payments under Fixed-Price Construction Contracts. The receipt of a proper payment request pursuant to Clause 52.232-27 Prompt Payment for Construction Contracts is contingent upon the Government receiving both acceptable and approvable hard copies and matching electronic export from QCS of the application for progress payment.

3.11 PRIMAVERA P6 MANDATORY REQUIREMENTS

If Primavera P6 is being used, request a backup file template (.xer) from the Government, if one is available, prior to building the schedule. The following settings are mandatory and required in all schedule submissions to the Government:

- a. Activity Codes must be Project Level, not Global or EPS level.
- b. Calendars must be Project Level, not Global or Resource level.
- c. Activity Duration Types must be set to "Fixed Duration & Units".
- d. Percent Complete Types must be set to "Physical".
- e. Time Period Admin Preferences must remain the default "8.0 hr/day, 40 hr/week, 172 hr/month, 2000 hr/year". Set Calendar Work Hours/Day to 8.0 Hour days.
- f. Set Schedule Option for defining Critical Activities to "Longest Path".
- g. Set Schedule Option for defining progressed activities to "Retained Logic".
- h. Set up cost loading using a single lump sum labor resource. The Price/Unit must be \$1/hr, Default Units/Time must be "8h/d", and settings "Auto Compute Actuals" and "Calculate costs from units" selected.
- i. Activity ID's must not exceed 10 characters.
- j. Activity Names must have the most defining and detailed description within the first 30 characters.

-- End of Section --

SECTION 01 33 00

SUBMITTAL PROCEDURES
05/11

PART 1 GENERAL

1.1 SUMMARY

The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections.

Units of weights and measures used on all submittals are to be the same as those used in the contract drawings.

Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

Contractor's Quality Control (CQC) System Manager to check and approve all items prior to submittal and stamp, sign, and date indicating action taken. Proposed deviations from the contract requirements are to be clearly identified. Include within submittals items such as:

Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals.

Submittals requiring Government approval are to be scheduled and made prior to the acquisition of the material or equipment covered thereby.

Pick up and dispose of samples not incorporated into the work in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

A submittal register showing items of equipment and materials for when submittals are required by the specifications is provided as "Appendix A - Submittal Register".

1.2 DEFINITIONS

1.2.1 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by Submittal Description (SD) numbers and titles as follows:

SD-01 Preconstruction Submittals

Submittals which are required prior to or the start of the next major phase of the construction on a multi-phase contract, includes schedules, tabular list of data, or tabular list including location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

Certificates of insurance

Howards Bay SND and GLLA Dredging
AS AWARDED

Surety bonds

List of proposed Subcontractors

List of proposed products

Construction progress schedule

Network Analysis Schedule (NAS)

Submittal register

Schedule of prices or Earned Value Report

Health and safety plan

Work plan

Contractor Quality Control(QC) plan

Environmental protection plan

Traffic Control Plan

Utility Location Findings

Sampling and Analysis Plan

Accident Prevention Plan

Photographic Documentation

Preconstruction Sampling

Onsite Material Handling Plan

Waste Transportation and Disposal Plan

Work Sequence Schedule

Erosion Control Plan

Sounding/Positioning Equipment Description and Calibration Data

Environmental Dredging Plan

Notice Of Start Of Environmental Dredging

Cover Placement Plan

Cover Placement Safety Plan

1.2.2 Approving Authority

Office or designated person authorized to approve submittal.

1.2.3 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, except those SD-01 Pre-Construction Submittals noted above, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register; G-AOF

1.4 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.4.1 Government Approved (G)

Government approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are considered to be "shop drawings."

1.4.2 For Information Only

Submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.5 PREPARATION

1.5.1 Transmittal Form

Use the attached sample transmittal form in Appendix B ENG Form 4025-R for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms are included in the RMS software that the Contractor is required to use for this contract. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and sheet number of the contract drawings pertinent to the data submitted for each item.

1.5.2 Source Drawings for Shop Drawings

The entire set of Source Drawing files (DWG) will not be provided to the Contractor. Only those requested by the Contractor to prepare shop drawings may be provided. Request the specific Drawing Number only for the preparation of Shop Drawings. These drawings may only be provided after award.

1.5.2.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic Source Drawing files are not construction documents. Differences may exist between the Source Drawing files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic Source Drawing files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished Source Drawing files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic Source Drawing files for use in producing construction data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

1.5.3 Electronic File Format

Provide submittals in electronic format, with the exception of material samples required for SD-04 Samples items. Compile the submittal file as a single, complete document, to include the Transmittal Form described within. Name the electronic submittal file specifically according to its contents, coordinate the file naming convention with the Contracting Officer. Electronic files must be of sufficient quality that all information is legible. Use PDF as the electronic format, unless otherwise specified or directed by the Contracting Officer. Generate PDF files from original documents with bookmarks so that the text included in the PDF file is both searchable and can be copied. If documents are scanned, Optical Character Resolution (OCR) routines are required. Index and bookmark files exceeding 30 pages to allow efficient navigation of the file. When required, the electronic file must include a valid electronic signature, or scan of a signature.

Email electronic submittal documents fewer than 10MB to an email address as directed by the Contracting Officer. Provide electronic documents over 10MB on an optical disc, or through an electronic file sharing system such as the AMRDEC SAFE Web Application located at the following website:
<https://safe.amrdec.army.mil/safe/>.

Provide hard copies of submittals when requested by the Contracting Officer. Up to 1 additional hard copy of any submittal may be requested at the discretion of the Contracting Officer, at no additional cost to the Government.

1.6 QUANTITY OF SUBMITTALS

1.6.1 Number of Samples SD-04 Samples

- a. Submit two samples, or two sets of samples showing range of variation, of each required item. One approved sample or set of samples will be retained by approving authority and one will be returned to Contractor.
- b. Submit one sample panel or provide one sample installation where directed. Include components listed in technical section or as directed.
- c. Submit one sample installation, where directed.
- d. Submit one sample of non-solid materials.

1.7 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.8 SUBMITTAL REGISTER

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved. A submittal register showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and additional submittals may be required. Maintain a submittal register for the project in accordance with Section 01 45 00.15 10 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)). The Government will provide the initial submittal register in electronic format.

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the Government.

1.8.1 Use of Submittal Register

Submit submittal register. Submit with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.8.2 Contractor Use of Submittal Register

Update the following fields with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.8.3 Approving Authority Use of Submittal Register

Update the following fields.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

1.8.4 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request.

1.9 VARIATIONS

Variations from contract requirements require Government approval pursuant to contract Clause FAR 52.236-21 "Specifications and Drawings for Construction" and will be considered where advantageous to Government.

1.9.1 Considering Variations

Discussion with Contracting Officer prior to submission will help ensure functional and quality requirements are met and minimize rejections and

re-submittals. When contemplating a variation which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

Specifically point out variations from contract requirements in transmittal letters. Failure to point out deviations may result in the Government requiring rejection and removal of such work at no additional cost to the Government.

1.9.2 Proposing Variations

When proposing variation, deliver written request to the Contracting Officer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Government. If lower cost is a benefit, also include an estimate of the cost savings. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

Check the column "variation" of ENG Form 4025 for submittals which include proposed deviations requested by the Contractor. Set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.9.3 Warranting that Variations are Compatible

When delivering a variation for approval, Contractor warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.9.4 Review Schedule Extension

In addition to normal submittal review period, a period of 10 working days will be allowed for consideration by the Government of submittals with variations.

1.10 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals.

a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.

b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A."

c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.

d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.11 GOVERNMENT APPROVING AUTHORITY

When approving authority is Contracting Officer, the Government will:

- a. Note date on which submittal was received.
- b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.
- c. Identify returned submittals with one of the actions defined in paragraph REVIEW NOTATIONS and with markings appropriate for action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date submittals. 1 copy of the submittal will be retained by the Contracting Officer and 1 copy of the submittal will be returned to the Contractor.

1.11.1 Review Notations

Submittals will be returned to the Contractor with the following notations:

- a. Submittals marked "approved" or "accepted" authorize the Contractor to proceed with the work covered.
- b. Submittals marked "approved as noted" or "approved, except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.
- c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.
- d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.12 DISAPPROVED OR REJECTED SUBMITTALS

Make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications; notice as required under the FAR clause 52.243-4 CHANGES, is to be given to the Contracting Officer. Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the Government requiring rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.13 APPROVED/ACCEPTED SUBMITTALS

The Contracting Officer's approval or acceptance of submittals is not to be construed as a complete check, and indicates only that the general method of construction, materials, detailing and other information are satisfactory.

Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work.

After submittals have been approved or accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.14 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, the Contractor to assure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those which may be damaged in testing, will be returned to the Contractor, at his expense, upon completion of the contract. Samples not approved will also be returned to the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. Government reserves the right to disapprove any material or equipment which previously has proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the Contracting Officer for testing. Samples failing to meet contract requirements will automatically void previous approvals. Contractor to replace such materials or equipment to meet contract requirements.

Approval of the Contractor's samples by the Contracting Officer does not relieve the Contractor of his responsibilities under the contract.

1.15 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

PART 2 PRODUCTS

Not Used

Howards Bay SND and GLLA Dredging
AS AWARDED

PART 3 EXECUTION

Not Used

-- End of Section --

Section 01 33 00 Appendix A
Submittal Register

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

Howards Bay SND and GLLA Dredging

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/	DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER			ACTION CODE
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 10 10	SD-01 Preconstruction Submittals														
			Additional Property Agreements	1.2.2	G RED												
		01 32 01.00 10	SD-01 Preconstruction Submittals														
			Project Scheduler Qualifications	1.3	G AOF												
			Preliminary Project Schedule	3.4.1	G AOF												
			Initial Project Schedule	3.4.2	G AOF												
			Periodic Schedule Update	3.4.3	G AOF												
		01 33 00	SD-01 Preconstruction Submittals														
			Submittal Register	1.8	G AOF												
		01 35 13.10	SD-01 Preconstruction Submittals														
			Traffic Control Plan	1.4.10	G AOF												
			Utility Location Findings	1.4.3	G AOF												
			Sampling and Analysis Plan	1.9.2	G AOF												
		01 35 26	SD-01 Preconstruction Submittals														
			Accident Prevention Plan (APP)	1.7	G AOF												
			SD-06 Test Reports														
			Monthly Exposure Reports	1.4													
			Notifications and Reports	1.12													
			LHE Inspection Reports	1.12.2													
			SD-07 Certificates														
			Crane Operators/Riggers	1.6.1.5													
			Standard Lift Plan	1.7.2.2	G AOF												
			Critical Lift Plan	1.7.2.3	G AOF												
			Naval Architecture Analysis	1.7.2.3	G AOF												
			Activity Hazard Analysis (AHA)	1.8													

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION

Howards Bay SND and GLLA Dredging

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 35 26	Confined Space Entry Permit	1.9.1													
			Hot Work Permit	1.9.1													
			Certificate of Compliance	1.12.3													
			License Certificates														
			Radiography Operation Planning Work Sheet		G AOF												
		01 35 29.13	SD-02 Shop Drawings														
			Work Zones	3.9.1	G AOF												
			Decontamination Facilities	3.10.1	G AOF												
			SD-03 Product Data														
			Amendments to the APP/SSHP	1.4													
			Exposure Monitoring/Air Sampling Program	3.5													
			Site Control Log	3.9.2													
			SSHO's Daily Inspection Logs	1.8													
			SD-07 Certificates														
			Certificate of Worker/Visitor Acknowledgement	1.7													
			SD-11 Closeout Submittals														
			Safety and Health Phase-Out Report	1.9													
		01 45 00.00 10	SD-01 Preconstruction Submittals														
			Contractor Quality Control (CQC) Plan	3.2	G AOF												
		01 45 00.10 10	SD-06 Test Reports														
			Daily CQC Report	1.6.3.1													
		01 57 19	SD-01 Preconstruction Submittals														

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 57 19	Preconstruction Documentation	1.6.1													
			Environmental Protection Plan	1.7	G AOF												
			Stormwater Notice of Intent	3.2.1.2	G AOF												
			Dirt and Dust Control Plan	1.7.9.1	G AOF												
			SD-06 Test Reports														
			Inspection Reports	3.2.1.3													
			Perimeter Air Monitoring Reports	1.7.9.3.5													
			SD-11 Closeout Submittals														
			Erosion Control and Stormwater Management Compliance Notebook	3.2.1.4	G AOF												
			Stormwater Notice of Termination	3.2.1.5	G AOF												
			Waste Determination Documentation	3.7.1	G AOF												
			Disposal Documentation for Hazardous and Regulated Waste	3.7.3.4	G AOF												
			Solid Waste Management Report	1.9	G AOF												
		01 78 00	SD-10 Operation and Maintenance Data														
			Operation and Maintenance Manuals		G AOF												
			SD-11 Closeout Submittals														
			As-Built Drawings	1.2.1	G AOF												
			Record Drawings	3.4	G AOF												
			As-Built Record of Equipment and Materials	3.7													
			Final Approved Shop Drawings	3.5													

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02 61 13	SD-01 Preconstruction Submittals														
			Onsite Material Handling Plan	1.2	G AOF												
			Photographic Documentation	3.2													
			Preconstruction Sampling	3.9.3.1													
			SD-03 Product Data														
			Solidification Agent	2.3													
			SD-06 Test Reports														
			Operations Records	3.7.3.3													
			Treatment Water Sample Results	3.9.2													
			Post-Removal Sampling	3.9.3.2	G AOF												
			SD-07 Certificates														
			Qualifications Of The Testing Laboratory	3.9.1													
			Transportation Documents	3.3.2.2													
			SD-11 Closeout Submittals														
			Closure Report	3.12	G AOF												
		02 61 14	SD-01 Preconstruction Submittals														
			Waste Transportation And Disposal Plan	3.1	G AOF												
			SD-06 Test Reports														
			Recordkeeping	3.6	G AOF												
			Exception Report	3.6	G AOF												
			Spill Response	3.7													
			SD-07 Certificates														
			Transportation And Disposal Coordinator	1.3.1	G AOF												
			Training	1.3.2	G AOF												

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02 61 14	Certificates Of Disposal	3.3.4	G AOF												
		02 66 00	SD-03 Product Data														
			Wisconsin Point Landfill Material Placement Plan	2.2	G AOF												
			SD-06 Test Reports														
			Material Tests For Topsoil	3.4.1													
		12 93 00	SD-02 Shop Drawings														
			Benches and Chairs		G AOF												
			Shelters	2.4	G AOF												
			Assembly Instruction Drawings	1.3.3													
			SD-03 Product Data														
			Benches and Chairs														
			Shelters	2.4													
			SD-04 Samples														
			Finish	2.2.2	G AOF												
			SD-06 Test Reports														
			Testing														
			SD-07 Certificates														
			Primer Certificate														
			Powder Coatings Certificate	1.3.4													
		31 00 00	SD-06 Test Reports														
			Analytical Testing	2.1													
			Gradation Testing	2.2													
			SD-07 Certificates														
			Location Of Imported Soils And Aggregate Sources	1.5.1													

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		31 00 00	Qualifications Of The Testing Laboratory	1.5.2													
		31 32 11	SD-01 Preconstruction Submittals														
			Work Sequence Schedule	1.7.1	G AOF												
			Erosion Control Plan	1.7.1	G AOF												
			SD-02 Shop Drawings														
			Layout	3.2.2	G AOF												
			Obstructions Below Ground	3.2.4	G AOF												
			Maintenance Record	3.8													
			SD-03 Product Data														
			Mulch Materials	2.1.1													
			Mulch Control Netting And Filter Fabric	2.1.2													
			Geotextile Fabrics	2.2													
			Erosion Control Blankets	2.3													
			Silt Fencing	2.4													
			Compost Filter Sock	2.5													
			Aggregate	2.6													
			Seed	2.8													
			Fertilizer And Soil Conditioners	2.9													
			SD-07 Certificates														
			Installer's Qualification	1.5.1													
			SD-10 Operation and Maintenance Data														
			Maintenance Instructions	3.8.2	G AOF												
			State approval for seed	2.8.1													
		35 20 23.13	SD-01 Preconstruction Submittals														

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		35 20 23.13	Dredge Plant Instrumentation Plan		G AOF												
			Contractor Quality Control Plan	3.5	G AOF												
			SD-06 Test Reports Data Appropriately Archived email	3.2.6	G AOF												
			SD-07 Certificates Letter of National Dredging Quality Management Program Certification		G AOF												
		35 20 23.43	SD-01 Preconstruction Submittals Sounding Equipment Description and Calibration Data														
			Dredging, Conveyance and Placement Plan	1.6	G AOF												
			Dredging, Conveyance and Placement Plan	3.5.2	G AOF												
			Dredging Placement Safety Plan	3.4.5	G AOF												
			Notice of Start of Dredging	3.1													
			SD-02 Shop Drawings Soundings														
			SD-06 Test Reports Daily Report of Dredging Operations		G AOF												
			SD-11 Closeout Submittals Material Disposal Records														

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		35 20 23.43	Existing Condition Photographs of Disposal Facility Structures	3.5.3													
		35 20 23.53	SD-01 Preconstruction Submittals														
			Sounding/Positioning Equipment Description And Calibration Data	1.5.2	G AOF												
			Environmental Dredging Plan	1.5.2	G AOF												
			Notice Of Start Of Environmental Dredging	3.3													
			SD-02 Shop Drawings														
			Check Surveys	3.5.3													
			SD-03 Product Data														
			Turbidity Monitoring Systems	2.4	G AOF												
			SD-06 Test Reports														
			Daily Report Of Environmental Dredging Operations	3.2	G AOF												
		35 20 24	SD-01 Preconstruction Submittals														
			Cover Placement Plan	1.3.2	G AOF												
			Cover Placement Safety Plan	3.3.1 & 3.4.1	G AOF												
			SD-03 Product Data														
			Cover Material	2.1													
			SD-06 Test Reports														
			Daily Report Of Operations	3.5													
			Gradation Test	2.1.2													
			Analytical Testing	2.1.3													

SECTION 01 35 13.10

SPECIAL PROJECT PROCEDURES

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. GOVERNMENT CODE OF FEDERAL REGULATIONS (CFR)

33 CFR 320-330 General Regulatory Policies, Permits,
Enforcement and Definitions

40 CFR 233 State Program Regulations

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA QA/C-5 Guidance for Quality Assurance Project Plans

Wisconsin Department of Natural Resources

NR 149 (July 2014) Laboratory Certification and
Registration

NR 700 (September 2018) General Requirements

WISCONSIN DEPARTMENT OF TRANSPORTATION(WisDOT)

WisDOT Standard Specifications (2020 Edition) Standard Specifications For
Highway And Structure Construction

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Traffic Control Plan; G-AOF

Submit a Traffic Control Plan for review and approval showing proposed routes for sediment transport from staging areas to off-site locations (Wisconsin Point Landfill or permitted disposal facility). This plan shall be prepared in accordance with the local, state, and federal regulations that pertain to transportation and traffic control. This plan shall indicate temporary signage, signals, barricades, flares, lights and other equipment, service, and personnel (e.g., flaggers) required to regulate and protect traffic

and warn of hazards. Plan shall indicate location and under what conditions each control measure will be used at each of the following: on Fraser property, entering/exiting Fraser property, and entering/exiting Wisconsin Point Landfill.

Utility Location Findings; G-AOF.

Submit a copy of the utility location findings prior to commencing work on the site.

Sampling and Analysis Plan; G-AOF.

Submit no later than 15 days after receipt of notice to proceed.

1.3 REGULATORY REQUIREMENTS

1.3.1 Additional Work Proposed and Not Authorized

1.3.1.1 Work Subject to 33 CFR 320-330

Any additional work (not specifically shown on the plans or delineated in the specifications) proposed by the Contractor in or affecting navigable waters, including wetlands (as defined in 33 CFR 320-330, published in the Federal Register Vol.51, No. 219, Thursday, November 13, 1986) shall not be performed without a Department of the Army Permit. This requirement shall be applicable to all work, permanent or temporary, and/or fill(s). The Department of the Army Permit shall be approved by the District Engineer or Deputy District Engineer in accordance with the laws of the United States and the regulations promulgated thereunder, including, but not limited to, the River and Harbor Act of 1899, the Clean Water Act and the National Environmental Policy Act of 1969, as amended. Corps employees (Contracting Officer's Representatives (COR) or inspectors) are not delegated authority to authorize such work. Information on making application for such permit(s) may be obtained by contacting one of the offices as listed hereinafter. When applying for information or a permit, a copy of any correspondence should be directed to the Contracting Officer of this contract. If a permit is not obtained, the additional work cannot be accomplished. Any delay in processing the permit will not constitute the basis of a claim under this contract. The fact that the Contractor is performing work under a Department of the Army Contract will give the Contractor no greater rights than any other applicant for a Department of the Army Permit.

WISCONSIN-MINNESOTA

Regulatory Functions Branch
Construction-Operations Division
U.S. Army Engineer District, St. Paul
190 Fifth Street East
St. Paul, MN 55101
Telephone: 651-290-5376

1.3.1.2 Work Subject to 40 CFR 233

Any additional work (not specifically shown on the plans or included in the specifications), proposed by the Contractor, in or affecting waters of the United States, including wetlands, in the State of Wisconsin (as defined in

40 CFR 233, published in the Federal Register, Vol. 49 No. 192, Tuesday October 2, 1984) shall not be performed without a State of Wisconsin regulatory permit. Information on making an application for such permit may be obtained by contacting the office listed hereinafter. When applying for a permit or for information, a copy of any correspondence shall be furnished to the Contracting Officer. If a permit is not obtained, the additional work shall not be performed. Any delay in obtaining or processing the permit will not constitute a basis for a claim under this contract.

STATE OF WISCONSIN

Department of Natural Resources
101 S. Webster St.
P.O. Box 7921
Madison, WI 53707-7921
Telephone: 608-266-2621

1.4 PROJECT/SITE CONDITIONS

1.4.1 Condition and Use of Project Site

The drawings indicate soundings and elevations at the dredging and disposal sites as found in condition surveys made as stated on the contract drawings. A notification of at least five (5) calendar days shall be given to the Contracting Officer prior to bringing any construction equipment or material upon the work site. The Contractor shall be responsible for damages that may be suffered due to its operations. The Contractor shall note CLAUSE 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS.

1.4.1.1 Physical Conditions

The physical conditions shown on the drawings are indicative of those that prevailed at the time of the site investigations and may be different than those at the time of construction. Significant variations that would require changes to the plans or specification shall be reported to the Contracting Officer immediately. The information shown on the logs of soil borings and sediment cores on the contract drawings is from borings located within or near the work areas. While the borings are representative of subsurface conditions at their respective locations and for their respective vertical reaches, localized variations of characteristics of the subsurface materials of this region are anticipated. Field logs of borings taken in the project area, soil samples, and other subsurface information obtained or prepared for this contract are available for examination upon request at the Engineering & Construction Division Design Branch, U.S. Army Corps of Engineers, Detroit District, 477 Michigan Avenue, Detroit, MI 48226.

1.4.1.2 Work and Staging Areas

Work and staging areas will be provided at the site and will be as designated on the contract drawings and/or approved by the Contracting Officer. Areas made available to the Contractor will be selected to minimize interference with property owner operations and other contractors.

1.4.2 Waterways Navigation and Traffic

The Contractor shall acquaint itself with all information and regulations pertaining to navigation and vessel traffic within the waterways at the project site. The Government will not undertake to keep the waterways free from vessels or other obstructions, except to the extent of such regulations, if any, as may be prescribed by the Secretary of the Army, in accordance with the provisions of Section 7 of the River and Harbor Act approved 8 August 1917 (see Title 33, U.S.C.A. Sec. 1). The Contractor is required to conduct its work in such manner as to obstruct navigation as little as possible and, in case the Contractor's plant so obstructs a channel as to make difficult or endanger the passage of vessels, said plant shall be promptly moved on the approach of any vessel to such an extent as may be necessary to afford a practicable passage. Upon completion of the work, the Contractor shall promptly remove its plant, including ranges, buoys, piles, and other marks placed by it under the contract in navigable waters or on shore.

1.4.2.1 Navigation

Information and regulations pertaining to navigation may be obtained from the current issue of the "UNITED STATES COAST PILOT 6," issued annually by the Department of Commerce, National Oceanic and Atmospheric Administration (NOAA). The "UNITED STATES COAST PILOT" may be obtained from National Ocean Survey, NOAA, Distribution Division-C44, Riverdale, Maryland 20840.

1.4.2.2 Traffic

Vessels that may use the waterways at the project site consist of recreational craft and commercial vessels. This traffic may interfere with contract operations and the Contractor shall conduct its work with due regard to and in coordination with the requirements of all navigation. Information regarding the types and amount of passages made by commercial vessels that may use the waterways at the project site may be obtained from the current issue of the "Waterborne Commerce of the United States, Part 3, Waterways and Harbors, Great Lakes," published by the Department of Army, Corps of Engineers. The Department of the Army publication may be obtained at no charge from the following:

District Engineer, U.S. Army Engineer District, New Orleans, Waterborne Commerce Section, P.O. Box 60267, New Orleans, Louisiana 70160. Phone 504-862-1425, FAX 504-862-1091.

1.4.3 Existing Vegetation, Structures, Equipment, Utilities & Improvements

General locations of applicable existing utilities, vegetation, structures, equipment and improvements, based upon latest information available to the Government have been shown on the drawings. However, it is the Contractor's obligation to establish the exact horizontal and vertical location and size of all existing utility lines which are located within the required work area. The Contractor shall submit a utility locating plan for locating existing utilities and a copy of its utility location findings prior to commencing work on the site. Any utility lines which are not found by the Contractor, but which are known to exist at the project site, shall be reported to the Contracting Officer immediately. The Contracting Officer will have the option of directing commencement of work at the site or requiring the Contractor to submit further plans for locating the utility lines. Once the utilities have been located and marked, the Contractor shall be deemed to have the location made known to it pursuant to Clause 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND

IMPROVEMENTS. If the Contractor damages any existing utility line, vegetation, structure, equipment or improvement, a report thereof shall be made immediately to the Contracting Officer. In any event, existing utility lines, vegetation, structures, equipment or improvements shall be protected from damage, and if damaged, shall be repaired by the Contractor at its own expense.

1.4.4 Vehicular Access

Throughout the period of work on this contract, the Contractor shall maintain an all-weather roadway through or around its work area when work therein would otherwise block an existing roadway. Such permanent or temporary roadways shall be kept open for use by emergency vehicles, as well as residential and commercial traffic at all times.

1.4.5 Utility Services

1.4.5.1 Contractor-Furnished Utility Services

The Contractor shall furnish, all water, electric current and other utilities required for its use.

1.4.5.2 Sanitary Facilities

The Contractor shall furnish all sanitary facilities required for its use at no additional expense to the Government.

1.4.6 Protection and Maintenance of Traffic

1.4.6.1 Haul Roads

The Contractor shall, at its own expense, construct access and haul roads necessary for proper prosecution of the work under this contract. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. The Contractor shall provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic. The method of dust control shall be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the Contracting Officer. Clearing of tree limbs along haul routes, if necessary, shall be coordinated with the City of Superior. Lighting shall be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations. Upon completion of the work, haul roads shall be removed unless otherwise approved by the Contracting Officer. Any dirt or mud which is tracked onto paved or surfaced roadways shall be promptly cleaned away.

1.4.6.2 Public Roads

Contractor shall comply with all federal, state, and local regulations and ordinances regarding truck routes and load restrictions on all public roads, including any seasonal or special weight limitations. Known roads with potential seasonal load restrictions are noted below:

Wisconsin Point Road: Not winter rated; possible weight limitations until mid-to late May.

Contractor shall verify the status and restrictions of all roads along trucking routes.

Prior to start of hauling material over public roads not part of the state trunk highway system, Contractor shall document condition of such roads and features in accordance with the Section 6-35.2 of the Wisconsin DOT Construction & Materials Manual. Documentation shall consist of consist of "before" and "after" photographs or video. Perform inspection and documentation in the presence of the COR and, if possible, the local authority responsible for maintenance of the road.

The Contractor shall, at its own expense, protect public roads necessary for proper implementation of the work under this contract. Any dirt or mud which is tracked onto paved or surfaced roadways shall be promptly cleaned away. Upon completion of the work, public roads shall be restored or replaced to acceptable conditions as determined by the COR. The extent of necessary repairs to Wisconsin Point Road will be directed by the COR based on a comparison of pre-construction and post-construction road conditions documented by the Government; repairs shall be performed in accordance with subparagraph WISCONSIN POINT ROAD REPAIRS of this Section. The Contractor shall provide 2150 tons of WISDOT 4 LT 58-34 S hot mix asphalt conforming to Section 460 of the WisDOT Standard Specifications for the repairs/replacement of Moccasin Mike Road to be performed by others. All other public roads used by the Contractor shall be documented.

1.4.6.2.1 Wisconsin Point Road Repairs

Contractor shall supply all traffic control and all incidental items necessary to complete the necessary repair work directed by the COR. Sawcut asphalt as marked and directed by the COR. Remove 13 inches of material, replace with (from bottom to top):

- a. 8 inches of compacted Base Aggregate Dense 1 1/4-inch meeting the requirements of WisDOT Standard Specifications Section 305.
- b. 3 inches of WISDOT asphaltic base course 3 LT 58-34 S meeting the requirements of WisDOT Standard Specifications Section 460.
- c. 2 inches of WISDOT wear course 4 LT 58-34 S meeting the requirements of WisDOT Standard Specifications Section 460.

Furnish, install, and compact each course in accordance with WisDOT Standard Specifications Sections 301, 305, 450, 455, and 460. Contractor shall transport and dispose of removed materials at an approved disposal facility licensed to accept wastes and in accordance with the requirements of SECTION 0261 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL.

1.4.6.3 Barricades

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe and public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

1.4.7 Security Requirements

1.4.7.1 Security Checks

All personnel employed by the Contractor in the performance of the services specified in this contract or any representative of the Contractor entering

the work area shall conform to all security regulations and rules which may be in effect during the contract period and will be subject to such checks as may be deemed necessary to ensure that no violations occur. The Contractor shall furnish a list of all employees who will be on the site and their work hours. The Contractor shall keep this list current.

1.4.7.2 Loitering

Contractor personnel shall not loiter in or around the place of duty during off-duty hours. Upon completion of assigned duty, employees shall depart the grounds.

1.4.8 Contract Supervision and Representation

The Contractor's local representative shall be available to Government representatives during duty hours, 8 a.m. to 4:30 p.m. (Central Time), on normal working days and shall be available by telephone at other times. The name of the Contractor's representative and the contact telephone number shall be furnished to the Government.

1.4.9 Coordination with Others

Reference is made to CLAUSE titled, "OTHER CONTRACTS". The Contractor is informed that the Government may have other Contractors engaged in placing dredged material into approximately the same Government-furnished disposal area provided for use under this contract. Sharing use of the mooring facilities with others may also be necessary.

The Contractor shall coordinate with property owners to remove any vessels and temporary structures prior to beginning and throughout work within the slips. Contractor shall be responsible for removing, storing, protecting from damage, and re-installing docks as necessary to complete the work. Docks shall be stored on land along east side of Hughitt slip. Docks shall be reinstalled in the same manner to match pre-construction conditions. Notify the Contracting Officer prior to and throughout coordination efforts. Contractor shall allow at least 3 weeks for coordination and removal of vessels and structures. Contractor shall assume that vessels will be removed by the vessel owner and that temporary structures will be removed by the Contractor and replaced following completion of work in the area.

The Contractor shall coordinate its operations with the work of others and share use of the facilities at no additional cost to the Government. The coordination shall be such that the required work under each affected contract is not prevented from being completed within its allowed completion time as a result of failure to cooperate and coordinate operations. Notify the Contracting Officer prior to and throughout coordination efforts.

1.4.10 Traffic Control Plan

The Contractor shall control traffic in accordance with its approved plan.

1.4.11 Temporary Lights, Signals and Buoys Required by Coast Guard

All temporary lights, signals and buoys required by the U.S. Coast Guard must be displayed during the required work. Information regarding required signals, lights, buoys and other requirements may be obtained from the

Commander, Ninth Coast Guard District, 1240 East Ninth Street, Cleveland,
Ohio 44199-2060, Telephone (216) 522-3990.

1.4.12 Navigation Buoys

1.4.12.1 Relocation of Existing Buoys

If the relocation of existing navigation buoys is required to perform the contract work, the Contractor shall request permission for their relocation from the U.S. Coast Guard through the Contracting Officer. Once relocated, a record shall be maintained of the buoy relocation position(s). The request shall be provided to the Contracting Officer not less than three (3) weeks prior to need of the buoy relocation. The Contractor shall be responsible for performing the relocation work, which shall be in accordance with U.S. Coast Guard requirements.

1.4.12.2 Temporary Dredging and Construction Buoys

In order to distinguish temporary buoys placed and maintained by the Contractor for dredging or construction purposes from aids to navigation placed by the U.S. Coast Guard, the Contractor's buoys shall be white and the top two (2) feet shall be light green in color. The Contractor shall remove its temporary buoys at the completion of the work.

1.4.12.3 Buoy Markings

If buoys with special markings are needed to indicate the different sides of the navigable channel, prior arrangements shall be made with the U.S. Coast Guard, through the Contracting Officer.

1.4.13 Layout of Work and Surveys

1.4.13.1 Layout of Work

The requirements in Clause 52.236-17 LAYOUT OF WORK must be referenced to the International Great Lakes Datum, 1985 (IGLD85). The Government has established bench marks and horizontal control points at the site of the work. Horizontal control points and descriptions of bench marks are shown on the drawings or supplied by the Contracting Officer Representative (COR).

1.4.13.2 Surveyor Requirements

From these control points and bench marks, the Contractor shall lay out the work by establishing all lines, grades, range markers and gauges at the site as necessary to control the work. All survey information shall be recorded in accordance with standard and approved methods and in the survey note format approved by the Contracting Officer. All field notes, sketches, recordings and computations made by the Contractor in performing the layout work shall be available at all times during the progress of the work for ready examination by the Contracting Officer or his or her duly authorized representative and upon completion of the contract work the originals shall be turned over to the Contracting Officer in ring binders.

1.4.13.3 Suspension

The Contracting Officer may require that work be suspended at any time when location and limit marks established by the Contractor are not reasonably

adequate to permit checking the work. Such suspension will be withdrawn upon satisfactory replacement of location and limit marks. Such suspension shall be at no additional cost to the Government and shall not entitle the Contractor to an extension of time for completing the work.

1.4.13.4 Verification

The Government may make checks as the work progresses to verify lines and grades established by the Contractor and to determine the conformance of the completed work as it progresses with the requirements of contract specifications and drawings. Such checking by the Contracting Officer or his or her representative shall not relieve the Contractor of its responsibility to perform all work in accordance with the contract drawings and specifications and the lines and grades given therein.

1.5 SEQUENCING AND SCHEDULING

1.5.1 Dredging Period Restriction

The Contractor's attention is directed to the allowed and prohibited dredging periods as established by the State of Wisconsin and as specified in SECTION 01 57 19, "TEMPORARY ENVIRONMENTAL CONTROLS" Paragraph, "PROTECTION OF FISH AND WILDLIFE RESOURCES", Subparagraph, "Allowed and Prohibited Dredging Periods". The number of calendar days within which the Contractor is required to complete the work under this contract, as established in Clause 52.211-10 COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK, includes the above referenced periods during which dredging is prohibited and the days in these periods will be counted when computing the required completion date.

1.5.2 Extended Hours of Operations

When the Contractor elects to work more than 8 hours per day, Monday through Friday and on Saturdays, Sundays, holidays or nights when not prohibited herein notice of its intention to do so shall be given to the Contracting Officer not less than forty-eight (48) hours in advance thereof. Adequate lighting for thorough inspection of night operations shall be provided by the Contractor at its expense.

1.5.3 Work Period Restrictions

Noise generating activities such as, but not limited to, pile driving, concrete breaking, and jackhammering are not allowed between 10 p.m. and 7 a.m. daily. The Government's on-site representative will make the final determination of which activities are allowed between 10 p.m. and 7 a.m. daily.

1.5.4 Start Work

Evidence that the Contractor has started preparation of submittal register, and other preconstruction activities will satisfy the requirement that work commence within 10 calendar days after receipt of Notice to Proceed. (See Clause 52.211-10 Commencement, Prosecution, and Completion of Work).

1.6 ACCOMMODATIONS FOR INSPECTORS

The Contractor shall, prior to the start of work, furnish a temporary field office for Government personnel, physically and acoustically separated from the Contractor's offices, located near the site of the work, as approved by

the Contracting Officer. The Contractor shall have the option of providing the field office facility in an existing or new building, or a trailer. All utilities as specified or required shall be hooked up and in working order prior to the start of work and shall be maintained during the entire contract period. The entire cost to the Contractor for furnishing, equipping and maintaining the accommodations shall be included in the contract price. If the Contractor fails to meet these requirements, the facilities will be secured by the Contracting Officer and the cost thereof will be deducted from payments to the Contractor. All facilities provided for the use of Government personnel under this Paragraph shall remain the property of the Contractor.

1.6.1 Field Office

The temporary field office shall have approximately 200 square feet of floor space and a minimum of seven (7) feet of headroom. An eight (8) foot by thirty (30) foot office trailer is acceptable. The field office or trailer shall be provided with a work table, two (2) lockable desks, and five (5) chairs. It shall be weatherproof and be supplied with heat in season, a minimum of one (1) door, electric lights, a telephone, internet connection with a minimum of 56k BPS, a medium production rate plain paper copier with sorter and paper supplies, a sufficient number of adjustable windows for adequate light and ventilation, toilet facilities with a wash basin with unheated water, and water cooler with approved drinking water. Telephone and internet service to the Government's field office will be provided by the Government. Contractor will be responsible for installation of cabling to support phone service from phone company's nearest point of presence into the Government's trailer. Exterior portable toilet facilities without wash basin may be provided in lieu of interior toilet facilities. The windows shall be screened and provided with locking devices, arranged to open and be securely fastened from the inside. In warm weather, air conditioning shall be furnished which will maintain the office at 50 percent relative humidity and a room temperature of 75 degrees F, or 20 degrees below the outside temperature when the outside temperature is 95 degrees F or higher. In addition to the above requirements, the Government field office or trailer shall be provided with the following:

1.6.1.1 Door Locks

Each exterior door shall be provided with an approved deadbolt lock in the door, key operated from both sides and tamperproof heavy duty hasp bolted to the door. Each lock shall be provided with two (2) keys.

1.6.1.2 Security Window Guards

All exterior window openings and glazed panels of exterior doors shall be provided with security window guards. As a minimum, they shall be round frame stationary window guards consisting of 1-1/2 inch diamond mesh No. 10 W & M gage wire, clinched to 3/8 inch round rod frames, secured to the building or trailer with tamperproof fastenings and shall cover the entire glazed opening.

1.6.1.3 Lighting

A light shall be installed over each exterior door and shall be kept lighted at night, including Saturdays, Sundays and holidays.

1.6.1.4 Storage Closet

The field office building or trailer shall have a closet for storage of pilferable equipment. The closet shall be at least three (3) foot by three (3) foot, floor to ceiling height, and have one (1) upper shelf. The door to the closet shall have an approved deadbolt lock or a hasp with an approved padlock. The hasp shall be installed with tamperproof type fastenings. Two (2) keys shall be provided for the deadbolt lock or padlock. Leaves of door hinges shall be unexposed.

1.6.1.5 Cleaning

The Contractor shall clean the office facility once each work week, or as directed. Cleaning shall include, but not be limited to, sweeping the floor, dusting furniture, collecting trash, floor scrubbing, window washing and toilet facility cleaning.

1.7 PROTECTION OF WELLS

The Contractor shall take all precautions necessary to protect any existing wells on private property within the vicinity of the work, including groundwater monitoring wells at Wisconsin Point Landfill. The Contractor shall protect against grout intruding into the wells and their underground water source. The wells shall not be physically damaged or have their production rate diminished as a result of the work required under this contract.

1.8 PROGRESS PHOTOGRAPHS

1.8.1 Photographs

Digital, color photographs will be taken at high resolutions and submitted as JPG files. The JPG files may be submitted on CD's or as email attachments. The Contractor is responsible for selecting formats and media compatible with Government equipment. The Government utilizes ordinary office software and hardware with Windows based products.

1.8.2 Prework Photographs

Before work begins, the Contractor shall photograph salient site features and conditions. Images shall be chosen so that a comparison with final photographs will provide a comprehensive record of the work accomplished under this contract.

1.8.3 Construction Photographs

During construction, the Contractor shall photograph every activity, every crew and every major piece of construction equipment. The Contractor will take special care to photograph activities resulting from each contract modifications.

1.8.4 Completion Photographs

At completion, the Contractor shall photograph salient site features and conditions. Images shall be chosen so that a comparison with prework photographs will provide a comprehensive record of the work accomplished under this contract.

1.8.5 Photo Database

The Contractor shall compile a simple database using common office software. Microsoft Access and Excel are examples of acceptable source software. The database may be submitted on a CD. The Contractor is responsible for selecting formats and media compatible with Government equipment. The Government utilizes ordinary office software and hardware with Windows based products. The Contractor shall prepare a single database where each and every submitted photograph submitted under this section is represented by a single record. At a minimum, each record in the database shall include the following fields: descriptive title, date taken, contract number.

1.9 SAMPLING AND MONITORING BY CONTRACTOR

Contractor shall perform the sampling and monitoring in accordance with this Section. Contractor will be responsible for the following sampling and monitoring:

- a. Community Air Monitoring in accordance with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.
- b. Water Treatment Effluent Sampling in accordance with Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.
- c. Staging Area Soil Samples in accordance with Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.
- d. Imported select fill and topsoil sampling in accordance with Section 02 66 00 SELECT FILL AND TOPSOIL FOR LANDFILL COVER and Section 31 00 00 EARTHWORK.
- e. Sediment Confirmation Sampling in in accordance with Section 35 20 23.53 ENVIRONMENTAL DREDGING.
- f. Turbidity Monitoring in accordance with Section 35 20 23.53 ENVIRONMENTAL DREDGING.
- g. Dredge monitoring in accordance with Section 35 20 23.53 ENVIRONMENTAL DREDGING.
- h. Cover Material sampling in accordance with Section 35 20 24 PLACEMENT OF SEDIMENT COVER MATERIAL.
- i. Residual Cover and Enhanced Natural Recovery Cover Placement Monitoring in accordance with Section 35 20 24 PLACEMENT OF SEDIMENT COVER MATERIAL.

1.9.1 General Requirements

Provide chemical sample acquisition, sample analysis, instrumental measurements of chemical parameters for chemical data quality control. An effective chemical data quality control system shall be established that meets the requirements for the chemical measurement Data Quality Objectives (DQO) applicable to the project. The system shall cover chemical measurements pertaining to and required for Contractor and subcontractor produced chemical data. Control field screening, sampling, and testing in conjunction with remedial activities to meet all DQO; minimize the amount of excavated material requiring temporary storage; prevent dilution of contaminated soils with clean soils; and ensure completion of work within the required time.

1.9.1.1 Data Quality Objectives (DQO)

Sample acquisition, chemical analysis and chemical parameter measurements shall be performed so that the resulting data meet and support data use

requirements. The chemical data shall be acquired, documented, verified and reported to ensure that the specified precision, accuracy, representativeness, comparability, completeness and sensitivity requirements are achieved.

1.9.2 Sampling and Analysis Plan (SAP)

The SAP shall contain a Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP). The SAP confirms the Contractor's understanding of the contract requirements for chemical data quality control, and describes procedures for field sampling and sample submittal for analysis, field chemical parameter measurement, data documentation, data assessment and data reporting requirements. Chemical measurements including sampling and/or parameter monitoring will not be permitted to begin until after Government approval of the SAP.

In the SAP, delineate the methods to be used to accomplish the chemical quality control items to assure accurate, precise, representative, complete, legally defensible and comparable data. Describe all chemical parameter measurements for all matrices for all phases of the remediation contract. Provide the SAP to field and laboratory personnel. Original/innovative approaches to chemical parameter measurements may be proposed for cost reduction and remediation efficiency by abbreviated sampling, contingency sampling and/or contingency analysis, indicator or tracer analysis, onsite analytical services, equivalency or screening methods. Clearly identify the Contractor obtained laboratories. Address all levels of the investigation with enough detail to become a document which may be used as an audit guide for field and laboratory work. Furnish copies of the Government approved SAP to all laboratories and the Contractor's field sampling crew.

1.9.2.1 Field Sampling Plan (FSP)

The FSP contains necessary technical detail and direction for the field personnel to understand sampling and field measurement requirements. In the FSP provide a comprehensive description and full detail for personnel to perform all onsite activities required to attain project DQO, including: locations of samples, sampling procedures for onsite and offsite chemical analysis, summaries of analyses to be performed on samples, shipment of samples for offsite analyses, performance of onsite and offsite instrumental parameter measurements, data documentation and reporting requirements.

1.9.2.2 Quality Assurance Project Plan (QAPP)

The QAPP contains necessary technical detail and direction for field and laboratory personnel to understand project sample analysis, quality control and data reporting requirements, analytical methods, required detection limits, QC requirements, and data validation and reporting requirements. The QAPP shall meet the requirements of EPA QA/C-5.

1.9.3 Analytical Testing Laboratories

Propose the analytical laboratories to be used for the primary samples analyses. Perform testing by a Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP) accredited testing laboratory or the Contractor's validated testing facility. Analytical laboratories shall also be accredited through the Wisconsin Department of Natural Resources Laboratory Certification Program for all parameters that have such

certifications and meet the criteria outlined in NR 149. Sample analysis shall meet the requirements of NR 700.13. The Contractor may utilize its own laboratory or utilize subcontract laboratories to achieve the primary required sample analyses.

1.9.3.1 Laboratory Analytical Requirements

Provide the specified chemical analyses by the Contractor's laboratory. Provide chemical analyses to achieve the project DQO for all parameters specified by the methods. To give the USACE programs the greatest flexibility in the execution of its projects, the EPA SW-846.3-3 methods are generally the methods employed for the analytical testing of environmental samples. These methods are flexible and shall be adapted to individual project-specific requirements.

1.9.3.2 Laboratory Performance

Provide continued acceptable analytical performance and shall establish a procedure to address data deficiencies noted by review and/or quality assurance sample results. Provide and implement a mechanism for providing analytical labs with the SAP, for monitoring the lab's performance and for performing corrective action procedures. Acquire analytical services with additional DoD ELAP or State of Wisconsin validated laboratories in the event a project lab loses its validation status during the project

1.9.3.3 Laboratory Data Packages

Provide laboratory chemistry data packages to the Contracting Officer with each submittal that includes reported laboratory data. The laboratory data package must contain information to demonstrate that the project's DQO have been fulfilled. The QA function will compare QA sample results to corresponding primary sample results, will assess the Contractor's compliance with the SAP, and will recommend corrective action as necessary.

1.10 VETERANS EMPLOYMENT EMPHASIS FOR U.S. ARMY CORPS OF ENGINEERS CONTRACTS

In addition to complying with the requirements outlined in FAR Part 22.13, FAR Provision 52.222-38, FAR Clause 52.222-35, FAR Clause 52.222-37, DFARS 222.13 and Department of Labor regulations, U.S. Army Corps of Engineers (USACE) contractors and subcontractors at all tiers are encouraged to promote the training and employment of U.S. veterans while performing under a USACE contract. While no set-aside, evaluation preference, or incentive applies to the solicitation or performance under the resultant contract, USACE contractors are encouraged to seek out highly qualified veterans to perform services under this contract. The following resources are available to assist USACE contractors in their outreach efforts:

- U.S. Department of Labor Veterans' Employment and Training Service (VETS):
<https://www.dol.gov/vets/>
- Federal Veteran Employment Information: <https://www.fedshirevets.gov/>
- Veterans Opportunity to Work (VOW) Program:
<https://www.benefits.va.gov/vow/>
- U.S. Army Warrior Transition Command Employment Index:
<https://wct.army.mil/modules/employers/index.html>
- Hiring Our Heroes: <https://www.uschamberfoundation.org/hiring-our-heroes>

PART 2 PRODUCTS

Howards Bay SND and GLLA Dredging
AS AWARDED

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.34	(2001; R 2012) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE A10.44	(2014) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ASSE/SAFE Z244.1	(2003; R 2014) Control of Hazardous Energy Lockout/Tagout and Alternative Methods
ASSE/SAFE Z359.0	(2012) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSE/SAFE Z359.1	(2007) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
ASSE/SAFE Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSE/SAFE Z359.12	(2009) Connecting Components for Personal Fall Arrest Systems
ASSE/SAFE Z359.13	(2013) Personal Energy Absorbers and Energy Absorbing Lanyards
ASSE/SAFE Z359.14	(2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems
ASSE/SAFE Z359.15	(2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems
ASSE/SAFE Z359.2	(2007) Minimum Requirements for a Comprehensive Managed Fall Protection Program
ASSE/SAFE Z359.3	(2007) Safety Requirements for Positioning and Travel Restraint Systems
ASSE/SAFE Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components

ASSE/SAFE Z359.6 (2009) Specifications and Design Requirements
for Active Fall Protection Systems

ASSE/SAFE Z359.7 (2011) Qualification and Verification Testing
of Fall Protection Products

ASME INTERNATIONAL (ASME)

ASME B30.20 (2013; INT Oct 2010 - May 2012) Below-the-Hook
Lifting Devices

ASME B30.22 (2010) Articulating Boom Cranes

ASME B30.26 (2015; INT Jun 2010 - Jun 2014) Rigging
Hardware

ASME B30.3 (2012) Tower Cranes

ASME B30.5 (2014) Mobile and Locomotive Cranes

ASME B30.8 (2010) Floating Cranes and Floating Derricks

ASME B30.9 (2014; INT Feb 2011 - Nov 2013) Slings

ASTM INTERNATIONAL (ASTM)

ASTM F855 (2015) Standard Specifications for Temporary
Protective Grounds to Be Used on De-energized
Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1048 (2003) Guide for Protective Grounding of Power
Lines

IEEE C2 (2012; Errata 2012; INT 1-4 2012; INT 5-7 2013;
INT 8-10 2014; INT 11 2015) National Electrical
Safety Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10 (2013) Standard for Portable Fire Extinguishers

NFPA 241 (2013; Errata 2015) Standard for Safeguarding
Construction, Alteration, and Demolition
Operations

NFPA 306 (2014) Standard for Control of Gas Hazards on
Vessels

NFPA 51B (2014) Standard for Fire Prevention During
Welding, Cutting, and Other Hot Work

NFPA 70 (2014; AMD 1 2013; Errata 1 2013; AMD 2 2013;
Errata 2 2013; AMD 3 2014; Errata 3-4 2014; AMD
4-6 2014) National Electrical Code

NFPA 70E (2015; ERTA 1 2015) Standard for Electrical
Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety and Health Requirements Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910 Occupational Safety and Health Standards

29 CFR 1910.146 Permit-required Confined Spaces

29 CFR 1910.147 Control of Hazardous Energy (Lock Out/Tag Out)

29 CFR 1910.333 Selection and Use of Work Practices

29 CFR 1915 Confined and Enclosed Spaces and Other
Dangerous Atmospheres in Shipyard Employment

29 CFR 1915.89 Control of Hazardous Energy (Lockout/Tags-Plus)

29 CFR 1926 Safety and Health Regulations for Construction

29 CFR 1926.1400 Cranes and Derricks in Construction

29 CFR 1926.16 Rules of Construction

29 CFR 1926.450 Scaffolds

29 CFR 1926.500 Fall Protection

49 CFR 173 Shippers - General Requirements for Shipments
and Packagings

CPL 2.100 (1995) Application of the Permit-Required
Confined Spaces (PRCS) Standards, 29 CFR
1910.146

1.2 DEFINITIONS

1.2.1 Competent Person (CP)

The CP is a person designated in writing, who, through training, knowledge and experience, is capable of identifying, evaluating, and addressing existing and predictable hazards in the working environment or working conditions that are dangerous to personnel, and who has authorization to take prompt corrective measures with regards to such hazards.

1.2.2 Competent Person, Confined Space

The CP, Confined Space, is a person meeting the competent person requirements as defined EM 385-1-1 Appendix Q, with thorough knowledge of OSHA's Confined Space Standard, 29 CFR 1910.146, and designated in writing to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined

space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.3 Competent Person, Cranes and Rigging

The CP, Cranes and Rigging, as defined in EM 385-1-1 Appendix Q, is a person meeting the competent person, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the Crane and Rigging Program, who through training, knowledge and experience in crane and rigging is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.4 Competent Person, Excavation/Trenching

A CP, Excavation/Trenching, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation/trenching is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.5 Competent Person, Fall Protection

The CP, Fall Protection, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and in accordance with ASSE/SAFE Z359.0, who has been designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.6 Competent Person, Scaffolding

The CP, Scaffolding is a person meeting the competent person requirements in EM 385-1-1 Appendix Q, and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to correctly identify, evaluate and address existing and potential hazards and also has the authority to take prompt corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific type of scaffold being used (e.g. mast-climbing, adjustable, tubular frame), in accordance with EM 385-1-1 Section 22.B.02.

1.2.7 Competent Person (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is qualified in the material presented, and who possesses a working knowledge of

applicable technical regulations, standards, equipment and systems related to the subject matter on which they are training Competent Persons. A competent person trainer must be familiar with the typical hazards and the equipment used in the industry they are instructing. The training provided by the competent person trainer must be appropriate to that specific industry. The competent person trainer must evaluate the knowledge and skills of the competent persons as part of the training process.

1.2.8 High Risk Activities

High Risk Activities are activities that involve work at heights, crane and rigging, excavations and trenching, scaffolding, electrical work, and confined space entry.

1.2.9 High Visibility Accident

A High Visibility Accident is any mishap which may generate publicity or high visibility.

1.2.10 Load Handling Equipment (LHE)

LHE is a term used to describe cranes, hoists and all other hoisting equipment (hoisting equipment means equipment, including crane, derricks, hoists and power operated equipment used with rigging to raise, lower or horizontally move a load).

1.2.11 Medical Treatment

Medical Treatment is treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

1.2.12 Near Miss

A Near Miss is a mishap resulting in no personal injury and zero property damage, but given a shift in time or position, damage or injury may have occurred (e.g., a worker falls off a scaffold and is not injured; a crane swings around to move the load and narrowly misses a parked vehicle).

1.2.13 Operating Envelope

The Operating Envelope is the area surrounding any crane or load handling equipment. Inside this "envelope" is the crane, the operator, riggers and crane walkers, other personnel involved in the operation, rigging gear between the hook, the load, the crane's supporting structure (i.e. ground or rail), the load's rigging path, the lift and rigging procedure.

1.2.14 Qualified Person (QP)

The QP is a person designated in writing, who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the work, or the project.

1.2.15 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the requirements of EM 385-1-1 Appendix Q, and ASSE/SAFE Z359.0, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

1.2.16 Recordable Injuries or Illnesses

Recordable Injuries or Illnesses are any work-related injury or illness that results in:

- a. Death, regardless of the time between the injury and death, or the length of the illness;
- b. Days away from work (any time lost after day of injury/illness onset);
- c. Restricted work;
- d. Transfer to another job;
- e. Medical treatment beyond first aid;
- f. Loss of consciousness; or
- g. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (a) through (f) above.

1.2.17 USACE Property and Equipment

Interpret "USACE" property and equipment specified in USACE EM 385-1-1 as Government property and equipment.

1.2.18 Load Handling Equipment (LHE) Accident or Load Handling Equipment Mishap

A LHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents, even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, or roll over). Document any mishap that meets the criteria described in the Contractor Significant Incident Report (CSIR) using the Crane High Hazard working group mishap reporting form.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G-AOF

SD-06 Test Reports

Monthly Exposure Reports

Notifications and Reports

LHE Inspection Reports

SD-07 Certificates

Crane Operators/Riggers

Standard Lift Plan; G-AOF

Critical Lift Plan; G-AOF

Naval Architecture Analysis; G-AOF

Activity Hazard Analysis (AHA)

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance

License Certificates

Radiography Operation Planning Work Sheet; G-AOF

1.4 MONTHLY EXPOSURE REPORTS

Provide a Monthly Exposure Report and attach to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both Prime and subcontractor. Failure to submit the report may result in retention of up to 10 percent of the voucher.

1.5 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, comply with the most recent edition of USACE EM 385-1-1, and the following federal, state, and local laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria,

ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.6 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

Provide an SSHO that meets the requirements of EM 385-1-1 Section 1. The SSHO must ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Alternate SSHO must be at the work site at all times to implement and administer the Contractor's safety program and government-accepted Accident Prevention Plan. The SSHO and Alternate SSHO must have the required training, experience, and qualifications in accordance with EM 385-1-1 Section 01.A.17, and all associated sub-paragraphs.

If the SSHO is off-site for a period longer than 24 hours, an equally-qualified alternate SSHO must be provided and must fulfill the same roles and responsibilities as the primary SSHO. When the SSHO is temporarily (up to 24 hours) off-site, a Designated Representative (DR), as identified in the AHA may be used in lieu of an Alternate SSHO, and must be on the project site at all times when work is being performed. Note that the DR is a collateral duty safety position, with safety duties in addition to their full time occupation.

1.6.1.2 Contractor Quality Control (CQC) System Manager:

The Contractor Quality Control System Manager cannot be the SSHO on this project, even though the CQC System Manager has safety inspection responsibilities as part of the QC duties.

1.6.1.3 Competent Person Qualifications

Provide Competent Persons in accordance with EM 385-1-1, Appendix Q and herein. Competent Persons for high risk activities include confined space, cranes and rigging, excavation/trenching, fall protection, and electrical work. The CP for these activities must be designated in writing, and meet the requirements for the specific activity (i.e. competent person, fall protection).

The Competent Person identified in the Contractor's Safety and Health Program and accepted Accident Prevention Plan, must be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the Contracting Officer for information in consultation with the Safety Office.

1.6.1.3.1 Competent Person for Confined Space Entry

Provide a Confined Space (CP) Competent Person who meets the requirements of EM 385-1-1, Appendix Q, and herein. The CP for Confined Space Entry must supervise the entry into each confined space.

If this work involves marine operations that handle combustible or hazardous materials, this person must have the ability to understand and follow through on the air sampling, Personal Protective Equipment (PPE), and instructions of a Marine Chemist, Coast Guard authorized persons, or Certified Industrial Hygienist. Confined space and enclosed space work must comply with NFPA 306, OSHA 29 CFR 1915, Subpart B, "Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment," or as applicable, 29 CFR 1910.147 for general industry.

1.6.1.3.2 Competent Person for Scaffolding

Provide a Competent Person for Scaffolding who meets the requirements of EM 385-1-1, Section 22.B.02 and herein.

1.6.1.3.3 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1, Section 21.C.04 and herein.

1.6.1.4 Qualified Trainer Requirements

Individuals qualified to instruct the 40-hour contract safety awareness course, or portions thereof, must meet the definition of a Competent Person Trainer, and, at a minimum, possess a working knowledge of the following subject areas: EM 385-1-1, Electrical Standards, Lockout/Tagout, Fall Protection, Confined Space Entry for Construction; Excavation, Trenching and Soil Mechanics, and Scaffolds in accordance with 29 CFR 1926.450, Subpart L.

Instructors are required to:

- a. Prepare class presentations that cover construction-related safety requirements.
- b. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at least five (5) years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.
- c. Update training course materials whenever an update of the EM 385-1-1 becomes available.
- d. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.
- e. Request, review and incorporate student feedback into a continuous course improvement program.

1.6.1.5 Crane Operators/Riggers

Provide Operators meeting the requirements in EM 385-1-1, Section 15.B for Riggers and Section 16.B for Crane Operators. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, designate crane operators qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Provide proof of current qualification.

1.6.2 Personnel Duties

1.6.2.1 Duties of the Site Safety and Health Officer (SSHO)

The SSHO must:

- a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily production report.
- b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.
- c. Use OSHA's Form 300 to log work-related injuries and illnesses occurring on the project site for Prime Contractors and subcontractors. Post and maintain the Form 300 on the site Safety Bulletin Board.
- d. Maintain applicable safety reference material on the job site.
- e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.
- f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them.
- g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.
- h. Ensure subcontractor compliance with safety and health requirements.
- i. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets (SDS).
- j. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings.
- k. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

Superintendent, QC Manager, and SSHO are subject to dismissal if the above duties are not being effectively carried out. If Superintendent, QC Manager, or SSHO are dismissed, project work will be stopped and will not be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out.

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

- a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health officer, quality control manager, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).
- b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays.
- c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for review prior to the start of construction. Work is not permitted to begin work until an APP is established that is acceptable to the Contracting Officer.

1.6.3.2 Safety Meetings

Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors on the project location. The SSOH, supervisors, foremen, or CDSOs must conduct meetings at least once a week for the trade workers. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s) who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings 7 calendar days in advance.

1.6.3.3 Daily Tailgate Briefings

Prior to commencing work activities each day, daily meetings will be led by the Contractor and attended by the Contractor's representative(s), the Government's representative(s), and other parties to be on-site during the day to discuss day-to-day operations, daily schedule, health and safety issues, Contractor coordination issues and general project status. Daily tailgate briefings shall be documented by the Contractor in the Daily Contractor Quality Control (CQC) Reports.

1.7 ACCIDENT PREVENTION PLAN (APP)

A qualified person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, Appendix A, and as supplemented herein. Cover all paragraph and subparagraph elements in EM 385-1-1, Appendix A. The APP must be job-specific and address any unusual

or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP must be signed by an officer of the firm (Prime Contractor senior person), the individual preparing the APP, the on-site superintendent, the designated SSHO, the Contractor Quality Control Manager, and any designated Certified Safety Professional (CSP) or Certified Health Physicist (CIH). The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. Once reviewed and accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP, as necessary, throughout the life of the contract. Changes to the accepted APP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and Quality Control Manager. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered. Should any severe hazard exposure (i.e. imminent danger) become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34), and the environment.

1.7.1 Names and Qualifications

Provide plans in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

- a. Names and qualifications (resumes including education, training, experience and certifications) of site safety and health personnel designated to perform work on this project to include the designated Site Safety and Health Officer and other competent and qualified personnel to be used. Specify the duties of each position.
- b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation

and control of chemical, physical and biological agents; and personal protective equipment and clothing to include selection, use and maintenance.

1.7.2 Plans

Provide plans in the APP in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

1.7.2.1 Confined Space Entry Plan

Develop a confined or enclosed space entry plan in accordance with EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive CPL 2.100, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

1.7.2.2 Standard Lift Plan (SLP)

Plan lifts to avoid situations where the operator cannot maintain safe control of the lift. Prepare a written SLP in accordance with EM 385-1-1, Section 16.A.03, using Form 16-2 for every lift or series of lifts (if duty cycle or routine lifts are being performed). The SLP must be developed, reviewed and accepted by all personnel involved in the lift in conjunction with the associated AHA. Signature on the AHA constitutes acceptance of the plan. Maintain the SLP on the LHE for the current lift(s) being made. Maintain historical SLPs for a minimum of 3 months.

1.7.2.3 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, Section 16.H.01, using Form 16-3. Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1, Section 16.F.03.

In addition to the requirements of EM 385-1-1, Section 16.H.02, the critical lift plan must include the following:

- a. For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.
- b. For barge mounted mobile cranes, provide a Naval Architecture Analysis and include an LHE Manufacturer's Floating Service Load Chart in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L.02. The Floating Service Load Chart must provide a table of rated load versus boom angle and radius. The Floating Service Load Chart must also provide the maximum allowable machine list and trim associated with the tabular loads and radii provided. If the Manufacturer's Floating Service Load Chart is not available, a floating service load chart may be developed and provided by a qualified Registered Professional Engineer (RPE), competent in the field of floating cranes.

The Load Chart must be in accordance with the criteria from the selected standard in EM 385-1-1, Section 16.L; provide a table of rated load versus boom angle and radius; provide the maximum allowable machine list and machine trim associated with the tabular loads and radii provided; and be stamped by a RPE qualified and competent in the field of floating cranes. The RPE, competent in the field of floating cranes must stamp and certify (sign) that the Naval Architectural Analysis (NAA) meets the requirements of EM 385-1-1, Section 16.L.03.

- c. Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.

1.7.2.4 Fall Protection and Prevention (FP&P) Plan

The plan must comply with the requirements of EM 385-1-1, Section 21.D and ASSE/SAFE Z359.2, be site specific, and address all fall hazards in the work place and during different phases of construction. Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A competent person or qualified person for fall protection must prepare and sign the plan documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, roles and responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Review and revise, as necessary, the Fall Protection and Prevention Plan documentation as conditions change, but at a minimum every six months, for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Plan documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Plan documentation in the Accident Prevention Plan (APP).

1.7.2.5 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 Section 21.N and ASSE/SAFE Z359.2, and include in the FP&P Plan and as part of the APP. Include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility.

1.7.2.6 Hazardous Energy Control Program (HECP)

Develop a HECP in accordance with EM 385-1-1 Section 12, 29 CFR 1910.147, 29 CFR 1910.333, 29 CFR 1915.89, ASSE/SAFE Z244.1, and ASSE/SAFE A10.44. Submit this HECP as part of the Accident Prevention Plan (APP). Conduct a preparatory meeting and inspection with all effected personnel to coordinate all HECP activities. Document this meeting and inspection in accordance with EM 385-1-1, Section 12.A.02. Ensure that each employee is familiar with and complies with these procedures.

1.7.2.7 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1, Section 25.A and Section 31 00 00 EARTHWORK.

1.7.2.8 Occupant Protection Plan

Identify the safety and health aspects of lead-based paint removal, prepared in accordance with Section 02 83 19.00 10 LEAD BASED PAINT HAZARD ABATEMENT, TARGET HOUSING & CHILD OCCUPIED FACILITIES.

1.7.2.9 Asbestos Hazard Abatement Plan

Identify the safety and health aspects of asbestos work, and prepare in accordance with Section 02 82 13.00 10 ASBESTOS ABATEMENT.

1.7.2.10 Site Safety and Health Plan

Identify the safety and health aspects, and prepare in accordance with Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES.

1.7.2.12 Site Demolition Plan

Identify the safety and health aspects, and prepare in accordance with Section 02 41 00 STRUCTURAL DEMOLITION and referenced sources.

1.8 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor, subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in accordance with EM 385-1-1, Section 1 or as directed by the Contracting Officer. Submit the AHA for review at least 15 working days prior to the start of each activity task, or DFOW. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

AHAs must identify competent persons required for phases involving high risk activities, including confined entry, crane and rigging, excavations, trenching, electrical work, fall protection, and scaffolding.

1.8.1 AHA Management

Review the AHA list periodically (at least monthly) at the Contractor supervisory safety meeting, and update as necessary when procedures, scheduling, or hazards change. Use the AHA during daily inspections by the SSHO to ensure the implementation and effectiveness of the required safety and health controls for that work activity.

1.8.2 AHA Signature Log

Each employee performing work as part of an activity, task or DFOW must review the AHA for that work and sign a signature log specifically maintained for that AHA prior to starting work on that activity. The SSHO must maintain a signature log on site for every AHA. Provide employees whose primary language is other than English, with an interpreter to ensure a clear understanding of the AHA and its contents.

1.9 DISPLAY OF SAFETY INFORMATION

1.9.1 Safety Bulletin Board

Within one calendar day(s) after commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, may be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, Section 01.A.06. Additional items required to be posted include:

- a. Confined space entry permit.
- b. Hot work permit.

1.9.2 Safety and Occupational Health (SOH) Deficiency Tracking System

Establish a SOH deficiency tracking system that lists and monitors the status of SOH deficiencies in chronological order. Use the tracking system to evaluate the effectiveness of the APP. A monthly evaluation of the data must be discussed in the QC or SOH meeting with everyone on the project. The list must be posted on the project bulletin board and updated daily, and provide the following information:

- a. Date deficiency identified;
- b. Description of deficiency;
- c. Name of person responsible for correcting deficiency;
- d. Projected resolution date;
- e. Date actually resolved.

1.10 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in paragraph REFERENCES. Maintain applicable equipment manufacturer's manuals.

1.11 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.12 NOTIFICATIONS and REPORTS

1.12.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than twenty-four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, load handling equipment (LHE) or rigging mishaps, or any property damage. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.

Within notification include Contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (for example, type of construction equipment used and PPE used). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any mishap.

1.12.2 LHE Inspection Reports

Submit LHE inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.12.3 Certificate of Compliance and Pre-lift Plan/Checklist for LHE and Rigging

Provide a FORM 16-1 Certificate of Compliance for LHE entering an activity under this contract and in accordance with EM 385-1-1. Post certifications on the crane.

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1, Section 16.H.03 using Form 16-2 Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.13 HOT WORK

1.13.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the Contracting Officer. A permit is required from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two 20-pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot

Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of one hour after completion of the task or as specified on the hot work permit.

When starting work, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Department phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE FIRE DEPARTMENT IMMEDIATELY.

1.13.2 Work Around Flammable Materials

Obtain services from a NFPA Certified Marine Chemist for "HOT WORK" within or around flammable materials (such as fuel systems or welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, or vaults) that have the potential for flammable or explosive atmospheres.

Whenever these materials, except beryllium and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1, Section 06.H

1.15 CONFINED SPACE ENTRY REQUIREMENTS.

Confined space entry must comply with Section 34 of EM 385-1-1, OSHA 29 CFR 1926, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, and OSHA Directive CPL 2.100. Any potential for a hazard in the confined space requires a permit system to be used.

1.15.1 Entry Procedures

Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. Comply with EM 385-1-1, Section 34 for entry procedures. Hazards pertaining to the space must be reviewed with each employee during review of the AHA.

1.15.2 Forced Air Ventilation

Forced air ventilation is required for all confined space entry operations and the minimum air exchanger requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its action level.

1.15.3 Sewer Wet Wells

Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

1.15.4 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan must not rely on local emergency responders for rescue from a confined space.

1.16 DIVE SAFETY REQUIREMENTS

Develop a Dive Operations Plan, AHA, emergency management plan, and personnel list that includes qualifications, for each separate diving operation. Submit these documents to the District Dive Coordinator (DDC) for review and acceptance at least 15 working days prior to commencement of diving operations. These documents must be at the diving location at all times. Provide each of these documents as a part of the project file.

1.17 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

- a. Secure outside equipment and materials and place materials that could be damaged in protected areas.
- b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.
- c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

Comply with EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE includes:

- a. Hard Hat
- b. Long Pants
- c. Appropriate Safety Shoes
- d. Appropriate Class Reflective Vests

3.1.1 Worksite Communication

Employees working alone in a remote location or away from other workers must be provided an effective means of emergency communications (i.e., cellular phone, two-way radios, land-line telephones or other acceptable means). The selected communication must be readily available (easily within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. An employee check-in/check-out communication procedure must be developed to ensure employee safety.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint, and hexavalent chromium, are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval.

3.1.3 Unforeseen Hazardous Material

Contract documents identify materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e. 29 CFR Part 1910.1000). If material(s) that may be hazardous to human health upon disturbance are encountered during construction operations, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to Clause 52.243-4 Changes and Clause 52.236-2 Differing Site Conditions.

3.2 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages at least 14 days in advance. As a minimum, the request must include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer, the Installation representative and the Public Utilities representative to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1 Section 12, 29 CFR 1910.333, 29 CFR 1915.89, and paragraph HAZARDOUS ENERGY CONTROL PROGRAM (HECP).

3.4 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures in accordance with ASSE/SAFE Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

3.4.1 Training

Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall

hazards. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSE/SAFE Z359.2 in the AHA.

3.4.2 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section 21.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 Section 21.I, 29 CFR 1926.500 Subpart M, ASSE/SAFE Z359.0, ASSE/SAFE Z359.1, ASSE/SAFE Z359.2, ASSE/SAFE Z359.3, ASSE/SAFE Z359.4, ASSE/SAFE Z359.6, ASSE/SAFE Z359.7, ASSE/SAFE Z359.11, ASSE/SAFE Z359.12, ASSE/SAFE Z359.13, ASSE/SAFE Z359.14, and ASSE/SAFE Z359.15.

3.4.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, other protection such as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1, Sections 21.0 through 21.0.06. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.4.2.2 Personal Fall Protection Harnesses

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. Harnesses must have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Snap hooks and carabiners must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. All full body harnesses must be equipped with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1, Section 21.I.06.

3.4.3 Fall Protection for Roofing Work

Implement fall protection controls based on the type of roof being constructed and work being performed. Evaluate the roof area to be accessed for its structural integrity including weight-bearing capabilities for the projected loading.

a. Low Sloped Roofs:

- (1) For work within 6 feet of an edge, on a roof having a slope less than or equal to 4:12 (vertical to horizontal), protect personnel from falling by use of personal fall arrest/restraint systems, guardrails, or safety nets. A safety monitoring system is not adequate fall protection and is not authorized. Provide in accordance with 29 CFR 1926.500.
- (2) For work greater than 6 feet from an edge, erect and install warning lines in accordance with 29 CFR 1926.500 and EM 385-1-1, Section L.

- b. Steep-Sloped Roofs: Work on a roof having a slope greater than 4:1 (vertical to horizontal) requires a personal fall arrest system, guardrails with toe-boards, or safety nets. This requirement also applies to residential or housing type construction.

3.4.4 Horizontal Lifelines (HLL)

Provide HLL in accordance with EM 385-1-1, Section 21.I.08.d.2. Commercially manufactured horizontal lifelines (HLL) must be designed, installed, certified and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500). The competent person for fall protection may (if deemed appropriate by the qualified person) supervise the assembly, disassembly, use and inspection of the HLL system under the direction of the qualified person. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site-specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

3.4.5 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1, Section 21.F.01 and 29 CFR 1926 Subpart M.

3.4.6 Rescue and Evacuation Plan and Procedures

When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue or assisted-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must comply with the requirements of EM 385-1-1, ASSE/SAFE Z359.2, and ASSE/SAFE Z359.4.

3.5 WORK PLATFORMS

3.5.1 Scaffolding

Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Comply with the following requirements:

- a. Scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system.
- b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.
- c. An adequate gate is required.
- d. Employees performing scaffold erection and dismantling must be qualified.
- e. Scaffold must be capable of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection and prevention plan.
- f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.
- g. Special care must be given to ensure scaffold systems are not overloaded.
- h. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first tie-in must be at the height equal to 4 times the width of the smallest dimension of the scaffold base.
- i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.
- j. Scaffold or work platform erectors must have fall protection during the erection and dismantling of scaffolding or work platforms that are more than six feet.
- k. Delineate fall protection requirements when working above six feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.5.2 Elevated Aerial Work Platforms (AWPs)

Workers must be anchored to the basket or bucket in accordance with manufacturer's specifications and instructions (anchoring to the boom may only be used when allowed by the manufacturer and permitted by the CP). Lanyards used must be sufficiently short to prohibit worker from climbing out of basket. The climbing of rails is prohibited. Lanyards with built-in shock absorbers are acceptable. Self-retracting devices are not acceptable. Tying off to an adjacent pole or structure is not permitted unless a safe device for 100 percent tie-off is used for the transfer.

Use of AWPs must be operated, inspected, and maintained as specified in the operating manual for the equipment and delineated in the AHA. Operators of AWPs must be designated as qualified operators by the Prime Contractor. Maintain proof of qualifications on site for review and include in the AHA.

3.6 EQUIPMENT

3.6.1 Material Handling Equipment (MHE)

- a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions. Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.
- b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.
- c. Operators of forklifts or power industrial trucks must be licensed in accordance with OSHA.

3.6.2 Load Handling Equipment (LHE)

- a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.
- b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be coordinated. Contractor's operator must remain with the crane during the spot check. Rigging gear must comply with OSHA, ASME B30.9 Standards safety standards.
- c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.
- d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.8 for floating cranes and floating derricks, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.
- e. Under no circumstance must a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.
- f. When operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.
- g. Do not use crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure the activity and AHA are thoroughly reviewed by all involved personnel.
- h. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.

- i. All employees must keep clear of loads about to be lifted and of suspended loads.
- j. Use cribbing when performing lifts on outriggers.
- k. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.
- l. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.
- m. Maintain inspection records in accordance by EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.
- n. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.
- o. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).
- p. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.

3.6.3 Machinery and Mechanized Equipment

- a. Proof of qualifications for operator must be kept on the project site for review.
- b. Manufacture specifications or owner's manual for the equipment must be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

3.6.4 USE OF EXPLOSIVES

Explosives must not be used or brought to the project site without prior written approval from the Contracting Officer. Such approval does not relieve the Contractor of responsibility for injury to persons or for damage to property due to blasting operations.

Storage of explosives, when permitted on Government property, must be only where directed and in approved storage facilities. These facilities must be kept locked at all times except for inspection, delivery, and withdrawal of explosives.

3.7 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.

3.7.1 Utility Locations

Provide a third party, independent, private utility locating company to positively identify underground utilities in the work area in addition to any station locating service and coordinated with the station utility department.

3.7.2 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within three feet of the underground system.

3.7.3 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever contract work involves chipping, saw cutting, or core drilling through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with station utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company must locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.8 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, Appendix A, Sections 11 and 12.

3.8.1 Conduct of Electrical Work

As delineated in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases, obtain an energized work permit from the Contracting Officer. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator is allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When working in energized substations, only qualified electrical workers are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA. Ensure that each employee is familiar with and complies with these procedures and 29 CFR 1910.147.

3.8.2 Qualifications

Electrical work must be performed by QP personnel with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State, Local requirements applicable to where work is being performed.

3.8.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.8.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

Check grounding circuits to ensure that the circuit between the ground and a grounded power conductor has a resistance low enough to permit sufficient current flow to allow the fuse or circuit breaker to interrupt the current.

3.8.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI) protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

-- End of Section --

SECTION 01 35 29.13

HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN PETROLEUM INSTITUTE (API)

API RP 2219 (2016) Safe Operation of Vacuum Trucks Handling Flammable and Combustible Liquids in Petroleum Service

INTERNATIONAL SAFETY EQUIPMENT ASSOCIATION (ISEA)

ANSI/ISEA Z358.1 (2014) American National Standard for Emergency Eyewash and Shower Equipment

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH 85-115 (1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 (2014) Safety and Health Requirements Manual

EM 385-1-97 (2013) Explosives - Safety and Health Requirements Manual

ER 385-1-92 (2007) Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Activities

ER 385-1-95 (2007; Errata 2007) Safety -- Safety and Health Requirements for Munitions and Explosives of Concern (MEC) Operations

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1904 Recording and Reporting Occupational Injuries and Illnesses

29 CFR 1910 Occupational Safety and Health Standards

29 CFR 1910.120 Hazardous Waste Operations and Emergency Response

29 CFR 1926 Safety and Health Regulations for Construction

29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

1.2 PRECONSTRUCTION SAFETY CONFERENCE

Conduct a preconstruction safety conference prior to the start of site activities and after submission of the Accident Prevention Plan/Site Safety And Health Plan (APP/SSHP). The objective of the meeting is to discuss health and safety concerns related to the impending work, discuss project health and safety organization and expectations, review and answer comments and concerns regarding the APP/SSHP or other health and safety concerns. Ensure that those individuals responsible for health and safety at the project level are available and attend this meeting.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Work Zones; G-AOF
Decontamination Facilities; G-AOF

SD-03 Product Data

Amendments to the APP/SSHP
Exposure Monitoring/Air Sampling Program
Site Control Log
SSHO's Daily Inspection Logs

SD-07 Certificates

Certificate Of Worker/Visitor Acknowledgement

SD-11 Closeout Submittals

Safety and Health Phase-Out Report

1.4 ACCIDENT PREVENTION PLAN/SITE SAFETY AND HEALTH PLAN (APP/SSHP)

Develop and implement a Site Safety and Health Plan in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS, and attach to the Accident Prevention Plan (APP) as an appendix (APP/SSHP). Address all occupational safety and health hazards (traditional construction as well as contaminant-related hazards) associated with cleanup operations within the APP/SSHP.

Cover each SSHP element in sections 28.A.01 and 33.B of EM 385-1-1 and each APP element in Appendix A of EM 385-1-1. There are overlapping elements in Section 28.A.01 and Appendix A of EM 385-1-1. SSHP appendix elements that overlap with APP elements need not be duplicated in the APP/SSHP provided each safety and occupational health (SOH) issue receives adequate attention and is documented in the APP/SSHP. The APP/SSHP is a dynamic document, subject to change as project operations/execution change. Modify the APP/SSHP to address changing and previously unidentified health and safety conditions. Ensure that the APP/SSHP is updated accordingly. Submit amendments to the APP/SSHP to the Contracting Officer as the APP/SSHP is updated. For long duration projects resubmit the APP/SSHP to the Contracting Officer annually for review. The APP/SSHP must contain all updates.

1.4.1 Acceptance and Modifications

Prior to submittal, the APP/SSHP must be signed and dated by the Safety and Health Manager and the Site Superintendent. Submit for review 15 calendar days prior to the Preconstruction Safety Conference. Deficiencies in the APP/SSHP will be discussed at the preconstruction safety conference, and must be revised to correct the deficiencies and resubmitted for acceptance. Onsite work must not begin until the plan has been accepted. Maintain a copy of the written APP/SSHP onsite. Changes and modifications to the APP/SSHP must be made with the knowledge and concurrence of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer. Bring to the attention of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer any unforeseen hazard that becomes evident during the performance of the work, through the Site Safety and Health Officer (SSHO) for resolution as soon as possible. In the interim, take necessary action to re-establish and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Disregard for the provisions of this specification or the accepted APP/SSHP is cause for stopping work until the matter has been rectified.

1.4.2 Availability

Make available the APP/SSHP in accordance with 29 CFR 1910.120, (b)(1)(v) and 29 CFR 1926.65, (b)(1)(v).

1.5 STAFF ORGANIZATION, QUALIFICATION AND RESPONSIBILITIES

Provide hazardous waste operations and emergency response organization in accordance with EM 385-1-1, Section 33.

1.5.1 Safety and Health Manager

Safety and Health Manager must be certified by the American Board of Industrial Hygiene or the Board of Certified Safety Professionals.

Apply the following in conjunction with the required qualifications and responsibilities stated in EM 385-1-1, Section 33.C.01.

1.5.1.1 Additional Qualifications

The Safety and Health Manager must have the following qualifications:

- a. A minimum of 5 years experience in developing and implementing safety and occupational health programs at similar environmental remediation projects.
- b. Documented experience in supervising professional and technician level personnel.
- c. Documented experience in developing worker exposure assessment programs and air monitoring programs and techniques.
- d. Documented experience in managing personal protective equipment (PPE) programs and conducting PPE hazard evaluations for the types of activities and hazards likely to be encountered on the project.
- e. Working knowledge of state and Federal occupational safety and health regulations.

1.5.1.2 Responsibilities and Duties

- a. Development, implementation, oversight, and enforcement of the APP/SSHP.
- b. Provide onsite consultation as needed to ensure the APP/SSHP is fully implemented.
- c. Conduct initial site-specific training.
- d. Be present onsite during the first 3 days of remedial activities and at the startup of each new major phase of work.
- e. Visit the site as needed and at least once per week for the duration of activities, to audit the effectiveness of the APP/SSHP.
- f. Be available for emergencies.
- g. Coordinate any modifications to the APP/SSHP with the Site Superintendent, the SSHO, and the Contracting Officer.
- h. Be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE.
- i. Provide continued support for upgrading/downgrading of the level of personal protection.
- j. Serve as a member of the quality control staff.
- k. Review accident reports and results of daily inspections.
- l. Sign and date the APP/SSHP prior to submittal.

1.5.2 Site Safety and Health Officer

Designate an individual and one alternate as the Site Safety and Health Officer (SSHO). Include the name, qualifications (education and training summary and documentation), and work experience of the Site Safety and Health Officer and alternate in the APP/SSHP.

Apply the following in conjunction with the required qualifications and responsibilities stated in EM 385-1-1, Section 33.C.02.

1.5.2.1 Qualifications

The following requirements are in addition to those in Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

- a. A minimum of 3 year experience in implementing SOH programs at environmental remediation projects of similar scope to the project.
- b. Meet 29 CFR 1910.120/29 CFR 1926.65 requirements for 40-hour initial and 8-hour supervisor training and, maintain 8-hour refresher training requirements.
- c. Specific training in personal and respiratory protective equipment, confined space entry and in the proper use of air monitoring instruments and air sampling methods.
- d. Documented experience in construction techniques and construction safety procedures.
- e. Working knowledge of Federal and state occupational SOH regulations.

1.5.2.2 Responsibilities and Duties

The following requirements are in addition to those in Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

- a. Assist and represent the Safety and Health Manager in onsite training and the day to day onsite implementation and enforcement of the accepted APP/SSHP.
- b. Be assigned to the site on a full-time basis for the duration of field activities. The SSO can have collateral duties in addition to SOH related duties. If operations are performed during more than 1 work shift per day, a site Safety and Health Officer must be present for each shift.
- c. Have authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions.
- d. Have authority to ensure site compliance with specified SOH requirements, Federal, state and OSHA regulations and all aspects of the APP/SSHP including, but not limited to, activity hazard analyses, air monitoring, use of PPE, decontamination, site control, standard operating procedures used to minimize hazards, safe use of engineering controls, the emergency response plan, confined space entry procedures, spill containment program, and preparation of records by performing a daily SOH inspection and documenting results on the Daily Safety Inspection Log in accordance with 29 CFR 1904.
- e. In coordination with site management and the Safety and Health Manager, recommend corrective actions for identified deficiencies and oversee the corrective actions.

- f. Consult with and coordinate any modifications to the APP/SSHP with the Safety and Health Manager, the Site Superintendent, and the Contracting Officer.
- g. Conduct daily safety inspection and document SOH findings into the Daily Safety Inspection Log. Track noted SOH deficiencies to ensure that they are corrected.
- h. Conduct accident investigations and prepare accident reports.
- i. Serve as a member of the quality control staff on matters relating to SOH.

1.5.3 Persons Certified in First Aid and CPR

At least two persons who are currently certified in first aid and CPR by the American Red Cross or other approved agency must be onsite at all times during site operations. They must be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030. These persons may perform other duties but must be immediately available to render first aid when needed.

1.6 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

Develop and implement an Emergency Response Plan, that meets the requirements of EM 385-1-1 Section 33.G, 29 CFR 1910.120 (l) and 29 CFR 1926.65 (l), as a section of the APP/SSHP. In the event of any emergency associated with remedial action, without delay, alert all onsite employees and as necessary offsite emergency responders that there is an emergency situation; take action to remove or otherwise minimize the cause of the emergency; alert the Contracting Officer; and institute measures necessary to prevent repetition of the conditions or actions leading to, or resulting in, the emergency. Train employees that are required to respond to hazardous emergency situations to their level of responsibility according to 29 CFR 1910.120 (q) and 29 CFR 1926.65 (q) requirements. Rehearse the plan regularly as part of the overall training program for site operations. Review the plan periodically and revised as necessary to reflect new or changing site conditions or information. Provide copies of the Emergency Response Portion of the accepted APP/SSHP to the affected local emergency response agencies. Address, as a minimum, the following elements in the plan:

- a. Pre-emergency planning. Coordinate with local emergency response providers during preparation of the Emergency Response Plan. At a minimum, coordinate with local fire, rescue, hazardous materials response teams, police and emergency medical providers to assure all organizations are capable and willing to respond to and provide services for on-site emergencies. Ensure the Emergency Response Plan for the site is compatible and integrated with the local fire, rescue, medical and police security services available from local emergency response planning agencies.
- b. Personnel roles, lines of authority, communications for emergencies.
- c. Emergency recognition and prevention.
- d. Site topography, layout, and prevailing weather conditions.

- e. Criteria and procedures for site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control).
- f. Route maps to nearest prenotified medical facility. Site-support vehicles must be equipped with maps. At the beginning of project operations, drivers of the support vehicles must become familiar with the emergency route and the travel time required.
- g. Specific procedures for decontamination and medical treatment of injured personnel.
- h. Emergency alerting and response procedures including posted instructions and a list of names and telephone numbers of emergency contacts (physician, nearby medical facility, fire and police departments, ambulance service, Federal, state, and local environmental agencies; as well as Safety and Health Manager, the Site Superintendent, the Contracting Officer and their alternates).
- i. Criteria for initiating community alert program, contacts, and responsibilities.
- j. Procedures for reporting incidents to appropriate government agencies. In the event that an incident such as an explosion or fire, or a spill or release of toxic materials occurs during the course of the project, the appropriate government agencies must be immediately notified. In addition, verbally notify the Contracting Officer and the local district safety office immediately and submit a written notification within 24 hours. Include within the report the following items:
 - (1) Name, organization, telephone number, and location of the Contractor.
 - (2) Name and title of the person(s) reporting.
 - (3) Date and time of the incident.
 - (4) Location of the incident, i.e., site location, facility name.
 - (5) Brief summary of the incident giving pertinent details including type of operation ongoing at the time of the incident.
 - (6) Cause of the incident, if known.
 - (7) Casualties (fatalities, disabling injuries).
 - (8) Details of any existing chemical hazard or contamination.
 - (9) Estimated property damage, if applicable.
 - (10) Nature of damage, effect on contract schedule.
 - (11) Action taken to ensure safety and security.
 - (12) Other damage or injuries sustained, public or private.

- k. Procedures for critique of emergency responses and follow-up.

1.7 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGEMENT

A copy of a certificate of worker/visitor acknowledgement must be completed and submitted for each visitor allowed to enter contamination reduction or exclusion zones, and for each employee, following the Example Certificate of Worker/Visitor Acknowledgement at the end of this section.

1.8 INSPECTIONS

Attach to and submit with the Daily Quality Control reports the SSHO's Daily Inspection Logs. Include with each entry the following: date, work area checked, employees present in work area, PPE and work equipment being used in each area, special SOH issues and notes, and signature of preparer.

1.9 SAFETY AND HEALTH PHASE-OUT REPORT

Submit a Safety and Health Phase-Out Report in conjunction with the project close out report, prior to final acceptance of the work. Include the following minimum information :

- a. Summary of the overall performance of SOH (e.g., accidents or incidents including near misses, unusual events, lessons learned).
- b. Final decontamination documentation including procedures and techniques used to decontaminate equipment, vehicles, and on site facilities.
- c. Summary of exposure monitoring and air sampling accomplished during the project.
- d. Signatures of Safety and Health Manager and SSHO.

PART 2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

Comply with EM 385-1-1, 29 CFR 1926.65, 29 CFR 1910.120, OSHA requirements in 29 CFR 1910 and 29 CFR 1926 with work performed under this contract, and state specific OSHA requirements where applicable. Submit to the Contracting Officer for resolution matters of interpretation of standards before starting work. The most stringent requirements apply where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary.

2.2 PERSONAL PROTECTIVE EQUIPMENT

2.2.1 Site Specific PPE Program

Provide onsite personnel exposed to contaminants with appropriate personal protective equipment. Components of levels of protection (B, C, D and modifications) must be relevant to site-specific conditions, including heat and cold stress potential and safety hazards. Use only respirators approved by NIOSH. Keep protective equipment and clothing clean and well maintained. Include site-specific procedures to determine PPE program effectiveness and for onsite fit-testing of respirators, cleaning, maintenance, inspection,

cartridge change out, and storage of PPE within the PPE section of the APP/SSHPP.

2.2.2 Levels of Protection

The Safety and Health Manager must establish and evaluate as the work progresses the levels of protection for each work activity. Also establish action levels for upgrade or downgrade in levels of PPE. Describe in the SSHPP the protocols and the communication network for changing the level of protection. Address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, and individual medical considerations within the PPE evaluation protocol.

2.2.3 PPE for Government Personnel

Three clean sets of personal protective equipment and clothing (excluding air-purifying negative-pressure respirators and safety shoes, which will be provided by individual visitors), as required for entry into the Exclusion Zone and Contamination Reduction Zone, must be available for use by the Contracting Officer or official visitors. The items must be cleaned, maintained and stored onsite and clearly marked: "FOR USE BY GOVERNMENT ONLY." Provide basic training in the use and limitations of the PPE provided.

2.3 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

Maintain, as a minimum, the following items onsite and available for immediate use:

- a. First aid equipment and supplies.
- b. Emergency eyewashes and showers that comply with ANSI/ISEA Z358.1.
- c. Provide fire extinguishers of sufficient size and type at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.

PART 3 EXECUTION

3.1 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

Refer to the Design Document Report, GLLA Sediment Cleanup in Howards Bay, Superior, Wisconsin (DDR) for the site description and contamination characterization.

3.2 TRAINING

In conjunction with EM 385-1-1, Section 33D, meet the training program requirements for workers performing cleanup operations and who will be exposed to contaminants.

3.2.1 General HTRW Operations Training

All Personnel performing duties with potential for exposure to onsite contaminants must meet and maintain the following 29 CFR 1910.120/29 CFR 1926.65 (e) training requirements:

- a. 40 hours of off site HTRW instruction.
- b. 3 days actual on-the-job field experience under the direct supervision of a trained, experienced supervisor.
- c. 8 hours refresher training annually.

Onsite supervisors must have an additional 8 hours management and supervisor training specified in 29 CFR 1910.120/29 CFR 1926.65 (e) (4).

3.2.2 Pre-Entry Briefing

Prior to commencement of onsite field activities, all site employees, including those assigned only to the Support Zone, must attend a site-specific SOH training session. This session will be conducted by the Safety and Health Manager and the Site Safety and Health Officer to ensure that all personnel are familiar with requirements and responsibilities for maintaining a safe and healthful work environment. Thoroughly discuss procedures and contents of the accepted APP/SSHP and Sections 01.B.02 and 28.D.03 of EM 385-1-1. Each employee must sign a training log to acknowledge attendance and understanding of the training. Notify the Contracting Officer at least 5 days prior to the initial site-specific training session so government personnel involved in the project may attend.

3.2.3 Periodic Sessions

Conduct periodic onsite training by the SSHO at least daily for personnel assigned to work at the site during the following day. Address SOH procedures, work practices, any changes in the APP/SSHP, activity hazard analyses, work tasks, or schedule; results of previous week's air monitoring, review of safety discrepancies and accidents. Convene a meeting prior to implementation of the change should an operational change affecting onsite field work be made, to explain SOH procedures. Conduct site-specific training sessions for new personnel, visitors, and suppliers by the SSHO using the training curriculum outlines developed by the Safety and Health Manager. Each employee must sign a training log to acknowledge attendance and understanding of the training.

3.4 MEDICAL SURVEILLANCE PROGRAM

Meet all requirements of 29 CFR 1910.120/29 CFR 1926.65 medical surveillance program and EM 385-1-1, Section 33.G for workers performing cleanup operations and who will be exposed to contaminants. Ensure the Occupational Physician or the physician's designee performs the physical examinations and reviews examination results. Participation in the medical surveillance program is without cost to the employee, without loss of pay and at a reasonable time and place.

3.5 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

Prepare and implement by the Safety and Health Manager an exposure monitoring/air sampling program to identify and quantify SOH hazards and airborne levels of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment for affected site personnel. Include action levels for upgrading/downgrading PPE in the program. Submit personnel exposure monitoring/sampling results.

3.6 HEAT STRESS MONITORING AND MANAGEMENT

Document in the APP/SSHP and implement the procedures and practices in section 06.J. in EM 385-1-1 to monitor and manage heat stress.

3.7 SPILL AND DISCHARGE CONTROL

Develop and implement written spill and discharge containment/control procedures. Address laboratory waste packs, material handling equipment, as well as drum and container handling, opening, sampling, shipping and transport. Describe prevention measures, such as building berms or dikes; spill control measures and material to be used (e.g. booms, vermiculite); location of the spill control material; personal protective equipment required to cleanup spills; disposal of contaminated material; and who is responsible to report the spill. Storage of contaminated material or hazardous materials must be appropriately bermed, diked and contained to prevent any spillage of material on uncontaminated soil. If the spill or discharge is reportable, or human health or the environment are threatened, notify the National Response Center, the state, and the Contracting Officer as soon as possible. Provide control as required by Section 01 57 19 TEMPORARY ENVIRONMENT CONTROLS.

3.8 MATERIALS TRANSFER SAFETY

Remove liquids and residues from the tanks using explosion-proof or air-driven pumps. In accordance with EM 385-1-1, Section 9, electrically bond the tank and ground pump motors and suction hoses to prevent electrostatic ignition hazards. Use of a hand pump will be permitted to remove the last of the liquid from the bottom of the tanks. If a vacuum truck is used for removal of liquids or residues, the area of operation for the vacuum truck must be vapor free. Locate the truck upwind from the tank and outside the path of probable vapor travel. Discharge the vacuum pump exhaust gases through a hose of adequate size and length downwind of the truck and tank area. Vacuum truck operating and safety practices must conform to API RP 2219. Collect tank residues in drums, tanks, or tank trucks labeled according to 49 CFR 171 and 49 CFR 172 and disposed of as specified. Disconnect and drain fittings and lines of their contents after the materials have been transferred and the tanks have been exposed. Do not spill contents into the environment during cutting or disconnecting of tank fittings. Transfer materials drained into DOT-approved drums for storage and transportation. Use only non-sparking or non-heat producing tools to disconnect and drain or to cut through tank fittings. Electrical equipment (e.g., pumps, portable hand tools) used for tank preparation must be explosion-proof. Following cutting or disconnecting of the fittings, plug openings leading to the tanks.

3.9 SITE CONTROL MEASURES

Coordinate site control measures with Section 01 57 19 TEMPORARY ENVIRONMENT CONTROLS.

3.9.1 Work Zones

Initial anticipated work zone boundaries (exclusion zone, contamination reduction zone, support zone, all access points and decontamination areas) are to be clearly delineated on the site drawings. Base delineation of work zone boundaries on the contamination characterization data and the

hazard/risk analysis to be performed as described in EM 385-1-1 06.A.02. As work progresses and field conditions are monitored, work zone boundaries may be modified (and site drawings modified) with approval of the Contracting Officer. Clearly identify work zones and mark in the field (using fences, tape, or signs). Submit and post a site map, showing work zone boundaries and locations of decontamination facilities in the onsite office. Work zones must consist of the following:

3.9.1.1 Exclusion Zone (EZ)

The exclusion zone is the area where hazardous contamination is either known or expected to occur and the greatest potential for exposure exists. Control entry into this area and exit may only be made through the Contamination Reduction Zone (CRZ).

3.9.1.2 Contamination Reduction Zone (CRZ)

The CRZ is the transition area between the Exclusion Zone and the Support Zone. The personnel and equipment decontamination areas must be separate and unique areas located in the CRZ.

3.9.1.3 Support Zone (SZ)

The Support Zone is defined as areas of the site, other than exclusion zones and contamination reduction zones, where workers do not have the potential to be exposed to hazardous substances or dangerous conditions resulting from HTRW operations. Secure the Support Zone against active or passive contamination. Site offices, parking areas, and other support facilities must be located in the Support Zone.

3.9.2 Site Control Log

A log of personnel visiting, entering, or working on the site must be maintained. Include the following: date, name, agency or company, time entering and exiting site, time entering and exiting the exclusion zone (if applicable). Before visitors are allowed to enter the Contamination Reduction Zone or Exclusion Zone, they must show proof of current training, medical surveillance and respirator fit testing (if respirators are required for the tasks to be performed) and fill out a Certificate of Worker or Visitor Acknowledgment. Record this visitor information, including date, in the log.

3.9.3 Communication

Provide and install an employee alarm system that has adequate means of on and off site communication in accordance with 29 CFR 1910 Section .165. The means of communication must be able to be perceived above ambient noise or light levels by employees in the affected portions of the workplace. The signals must be distinctive and recognizable as messages to evacuate or to perform critical operations.

3.9.4 Site Security

Print signs in bold large letters on contrasting backgrounds. Signs must be visible from all points where entry might occur and at such distances from the restricted area that employees may read the signs and take necessary protective steps before entering.

3.10 PERSONAL HYGIENE AND DECONTAMINATION

Personnel entering the Exclusion or Contamination Reduction Zones or otherwise exposed to hazardous chemical vapors, gases, liquids, or contaminated solids must decontaminate themselves and their equipment prior to exiting the contamination reduction zone (CRZ) and entering the support zone. Consult Chapter 10.0 of NIOSH 85-115 when preparing decontamination procedures. Submit a detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by site workers as part of the APP/SSHP. Train employees in the procedures and enforce the procedures throughout site operations.

3.10.1 Decontamination Facilities

Submit drawings showing the layout of the personnel and equipment decontamination areas.

3.10.2 Personnel Decontamination

Initially set up a decontamination line in the CRZ. Employees must exit the exclusion zone through the CRZ and implement the following decontamination procedures and techniques: Scrub and rinse water proof outer garments, remove all outer garments, hand and face wash. It is the Site Safety and Health Officer's responsibility to recommend techniques to improve personnel decontamination procedures, if necessary.

3.10.3 Equipment Decontamination

Decontaminate the vehicles and equipment used in the EZ in the CRZ prior to leaving the EZ. Decontaminate vehicles and equipment used to handle or transport impacted sediments prior to handling or transporting clean materials.

3.10.3.1 Facilities for Equipment and Personnel

Provide an equipment decontamination station within the CRZ for decontaminating vehicles and equipment leaving the EZ. Construct a decontamination station pad, which meets the site decontamination needs for all vehicles and larger equipment decontamination. Construct the pad to capture decontamination water, including overspray, and allow for collection and removal of the decontamination water using sumps, dikes and ditches as required. Provide a designated "clean area" in the CRZ for performing equipment maintenance. Use this area when personnel are required by normal practices to come in contact with the ground, i.e., crawling under a vehicle to change engine oil. Equipment within the EZ or CRZ must be decontaminated before maintenance is performed.

3.10.3.2 Procedures

Procedures for equipment decontamination must be developed and utilized to prevent the spread of contamination into the SZ and offsite areas. These procedures must address disposal of contaminated products and spent materials used on the site, including, as a minimum, containers, fluids, and oils. Assume any item taken into the EZ to be contaminated and perform an inspection and decontaminate. Vehicles, equipment, and materials must be cleaned and decontaminated prior to leaving the site. Handle construction

Howards Bay SND and GLLA Dredging
AS AWARDED

material in such a way as to minimize the potential for contaminants being spread or carried offsite. Prior to exiting the site, vehicles and equipment must be monitored to ensure the adequacy of decontamination.

-- End of Section --

SECTION 01 45 00.00 10

QUALITY CONTROL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D3740 (2012a) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

ASTM E329 (2014a) Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program. Include all associated costs in the applicable Pricing Schedule item.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor Quality Control (CQC) Plan; G-AOF

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Establish and maintain an effective quality control (QC) system that complies with the Contract Clause titled "Inspection of Construction." QC consists of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The QC system covers all construction operations, both onsite and offsite, and must be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the Contract. In this context the highest level manager responsible for the overall construction activities at the site, including quality and production is the project superintendent. The project superintendent maintains a physical presence at the site at all times and is responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer. Assign a superintendent with a minimum of 5 years of experience on related projects with at least 2 years serving as a project manager or superintendent. The superintendent is a stand alone position and must be employed by the prime contractor.

3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN

Submit no later than 15 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The Government will consider an interim plan for the first 10 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional work.

3.2.1 Content of the CQC Plan

Include, as a minimum, the following to cover all construction-operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff will implement the three phase control system for all aspects of the work specified. Include a CQC System Manager that reports directly to a senior project (or corporate) official independent from the project superintendent.
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the Contract. Letters of direction to all other various quality control representatives outlining duties,

authorities, and responsibilities will be issued by the CQC System Manager. Furnish copies of these letters to the Contracting Officer.

- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures must be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.
- e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer are required to be used.)
- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.
- g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected.
- h. Reporting procedures, including proposed reporting formats.
- i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and is identified by different trades or disciplines, or it is work by the same trade in a different environment. Although each section of the specifications can generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in the Contractor Quality Control(CQC) Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, meet with the Contracting Officer and discuss the Contractor's quality control system.

Submit the CQC Plan a minimum of 15 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details must be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting will be prepared by the Government, signed by both the Contractor and the Contracting Officer and will become a part of the contract file. There can be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which can require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a Safety and Health Manager, CQC System Manager, and sufficient number of additional qualified personnel to ensure safety and Contract compliance. The Safety and Health Manager reports directly to a senior project (or corporate) official independent from the CQC System Manager. The Safety and Health Manager will also serve as a member of the CQC Staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff maintains a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure Contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization is responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization that is responsible for overall management of CQC and has the authority to act in all CQC matters for the Contractor. The CQC System Manager is required to be a construction person with a minimum of 5 years in related work. This CQC System Manager is on the site at all times during construction and is employed by the Prime Contractor. The CQC System Manager is assigned no other duties and reports directly to a senior project (or corporate) official independent from the Superintendent. Identify in the plan an alternate to serve in the event of the CQC System Manager's absence. The requirements for the alternate are the same as the CQC System Manager.

3.4.3 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: Civil and Environmental. These individuals or specialized technical companies are employees of the prime or subcontractor and must be responsible to the CQC System Manager; must be physically present at the construction site during work on the specialized personnel's areas of responsibility; must have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals can perform other duties but need to be allowed sufficient time to perform the specialized personnel's assigned quality control duties as described in the Quality Control Plan. A single person can cover more than one area provided that the single person is qualified to perform quality control activities in each designated area and that workload allows.

Experience Matrix	
Area	Qualifications
Civil	Graduate Civil Engineer or Construction Manager with 2 years experience in the type of work being performed on this project or technician with 5 yrs related experience
Environmental	Graduate Environmental Engineer with 3 years experience or Construction Manager with 2 years experience in the type of work being performed on this project or technician with 5 years related experience

3.4.4 Additional Requirement

In addition to the above experience and education requirements, the Contractor Quality Control (CQC) System Manager and Alternate CQC System Manager are required to have completed the Construction Quality Management (CQM) for Contractors course. If the CQC System Manager does not have a current certification, obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered by the Detroit District office and its various Area Offices. Contact the Contracting Officer for information on the next scheduled class.

The Construction Quality Management Training certificate expires after 5 years. If the CQC System Manager's certificate has expired, retake the course to remain current.

3.4.5 Organizational Changes

Maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, have to comply with the requirements in Section 01 33 00 SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements. When Section 01 91 00.15 TOTAL BUILDING COMMISSIONING are included in the contract, the submittals required by those sections have to be coordinated with Section 01 33 00 SUBMITTAL PROCEDURES to ensure adequate time is allowed for each type of submittal required.

3.6 CONTROL

CQC is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control are required to be conducted by the CQC System Manager for each definable feature of the construction work as follows:

3.6.1 Preparatory Phase

This phase is performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:

- a. A review of each paragraph of applicable specifications, reference codes, and standards. Make available during the preparatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain and make available in the field for use by Government personnel until final acceptance of the work.
- b. Review of the Contract drawings.
- c. Check to assure that all materials and/or equipment have been tested, submitted, and approved.
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the Contract.
- f. Examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- g. Review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- i. Check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

- j. Discussion of the initial control phase.
- k. The Government needs to be notified at least 48 hours in advance of beginning the preparatory control phase. Include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attach to the daily CQC report. Instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase is accomplished at the beginning of a definable feature of work. Accomplish the following:

- a. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing are in compliance with the contract.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government needs to be notified at least 48 hours in advance of beginning the initial phase for definable feature of work. Prepare separate minutes of this phase by the CQC System Manager and attach to the daily CQC report. Indicate the exact location of initial phase for definable feature of work for future reference and comparison with follow-up phases.
- g. The initial phase for each definable feature of work is repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the CQC documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may

be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. Procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site meeting the requirements in paragraph "Testing Laboratories" below. Perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Record results of all tests taken, both passing and failing on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports are submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated results in nonpayment for related work performed and disapproval of the test facility for this Contract.

3.7.2 Testing Laboratories

All testing laboratories must be accredited by the Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP) and certified or registered under Wisconsin Administrative Code NR 149 for the tests to be performed that have such certifications.

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel is required to meet criteria detailed in ASTM D3740 and ASTM E329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will pay the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the Contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Conduct an inspection of the work by the CQC System Manager near the end of the work, or any increment of the work established by a time stated in the SPECIAL CONTRACT REQUIREMENTS Clause, Clause 52.211-10 Commencement, Prosecution, and Completion of Work, or by the specifications. Prepare and include in the CQC documentation a punch list of items which do not conform to the approved drawings and specifications, as required by paragraph DOCUMENTATION. Include within the list of deficiencies the estimated date by which the deficiencies will be corrected. Make a second inspection the CQC System Manager or staff to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the project is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the work is complete. A Government Pre-Final Punch List may be developed as a result of this inspection. Ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a timely manner. These inspections and any deficiency corrections required by this paragraph need to be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the COR is required to be in attendance at the final acceptance inspection. Additional Government personnel can also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notify the Contracting Officer at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the Contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the Contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

Maintain current records providing factual evidence that required quality control activities and/or tests have been performed. Include in these records the work of subcontractors and suppliers on an acceptable form that includes, as a minimum, the following information:

- a. The name and area of responsibility of the Contractor/Subcontractor.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
- d. Test and/or control activities performed with results and references to specifications/drawings requirements. Identify the control phase (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.
- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- f. Submittals and deliverables reviewed, with Contract reference, by whom, and action taken.
- g. Offsite surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. Instructions given/received and conflicts in plans and/or specifications.
- k. Verification Statement.

Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a statement that equipment and materials incorporated in the work and workmanship comply with the Contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, prepare and submit one report for every 7 days of no work and on the last day of a no work period. All calendar days need to be accounted for throughout the life of the contract. The first report following a day of no work will be for that day only. Reports need to be signed and dated by the Contractor Quality Control(CQC) System Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the CQC System Manager Report.

3.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer can issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders will be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

End of Section -

SECTION 01 45 00.10 10

RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)

PART 1 GENERAL

1.1 CONTRACT ADMINISTRATION

The Government will use the Resident Management System (RMS) to assist in its monitoring and administration of this contract. The Contractor uses the Government-furnished Construction Contractor Mode of RMS, referred to as RMS CM, to record, maintain, and submit various information throughout the contract period. The Contractor mode user manuals, updates, and training information can be downloaded from the <URL HREF=http://rms.usace.army.mil>RMS</URL> web site (http://rms.usace.army.mil). The joint Government-Contractor use of RMS facilitates electronic exchange of information and overall management of the contract. RMS CM provides the means for the Contractor to input, track, and electronically share information with the Government in the following areas:

- Administration
- Finances
- Quality Control
- Submittal Monitoring
- Scheduling
- Import/Export of Data

1.1.1 Correspondence and Electronic Communications

For ease and speed of communications, both Government and Contractor will, to the maximum extent feasible, exchange correspondence and other documents in electronic format. Correspondence, pay requests and other documents comprising the official contract record will also be provided in paper format, with signatures and dates where necessary. Paper documents will govern, in the event of discrepancy with the electronic version.

1.1.2 Other Factors

Particular attention is directed to Contract Clause 52.236-15 Schedules for Construction Contracts", Contract Clause 52.232-1 Payments, Section 01 32 01.00 10 PROJECT SCHEDULE, Section 01 33 00 SUBMITTAL PROCEDURES, and Section 01 45 00.00 10 QUALITY CONTROL, which have a direct relationship to the reporting to be accomplished through RMS. Also, there is no separate payment for establishing and maintaining the RMS database; all costs associated therewith will be included in the contract pricing for the work.

1.2 RMS SOFTWARE

RMS is a Windows-based program that can be run on a stand-alone personal computer or on a network. The Government will make available the RMS software to the Contractor after award of the construction contract. Prior to the Pre-Construction Conference, the Contractor will be responsible to download, install and use the latest version of the RMS software from the Government's RMS Internet Website. Upon specific justification and request

by the Contractor, the Government can provide RMS on optical disk. Any program updates of RMS will be made available to the Contractor via the Government RMS Website as they become available.

1.2.1 RMS CONTRACTOR'S MODE (CM)

<TXT>RMS Contractor's Mode or RMS CM is the replacement for Quality Control System or QCS. The database remains the same. References to RMS in this specification includes RMS CM.</TXT>

1.3 SYSTEM REQUIREMENTS

The following is the minimum system configuration required to run RMS and Contractor Mode:

Minimum RMS System Requirements	
Hardware	
Windows-based PC	1.5 GHz 2 core or higher processor
RAM	8 GB
Hard drive disk	200 GB space for sole use by the CM system
Optical Disk (CD or DVD) Reader	N/A
Monitor	Screen resolution 1366 x 768
Mouse or other pointing device	
Windows compatible printer	Laser printer must have 4 MB+ of RAM
Connection to the Internet	minimum 4 Mbs per user
Software	
MS Windows	Windows 7 x 64 bit (RMS requires 64 bit O/S) or newer
Word Processing software	Viewer for MS Word 2013, MS Excel 2013, or newer
Microsoft.NET Framework	Coordinate with Government QA Representative for free version required
Email	MAPI compatible
Virus protection software	Regularly upgraded with all issued manufacturer's updates and is able to detect most zero day viruses.

1.4 RELATED INFORMATION

1.4.1 RMS User Guide

After contract award, download instructions for the installation and use of RMS CM from the Government RMS Internet Website.

1.4.2 Contractor Quality Control (CQC) Training

The use of RMS CM will be discussed with the QC System Manager during the mandatory CQC Training class.

1.5 CONTRACT DATABASE

Prior to the pre-construction conference, the Government will provide the Contractor with basic contract award data to use for RMS. The Government will provide data updates to the Contractor as needed. These updates will generally consist of submittal reviews, correspondence status, QA comments, and other administrative and QA data.

1.6 DATABASE MAINTENANCE

Establish, maintain, and update data in the RMS database throughout the duration of the contract at the Contractor's site office. Submit data updates to the Government (e.g., daily reports, submittals, RFI's, schedule updates, payment requests, etc.) using RMS. The RMS database typically includes current data on the following items:

1.6.1 Administration

1.6.1.1 Contractor Information

Contain within the database the Contractor's name, address, telephone numbers, management staff, and other required items. Within 7 calendar days of receipt of RMS software from the Government, deliver Contractor administrative data in electronic format in RMS.

1.6.1.2 Subcontractor Information

Contain within the database the name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor must be listed separately for each trade to be performed. Assign each subcontractor/trade a unique Responsibility Code, provided in RMS. Within 7 calendar days of receipt of RMS software from the Government, deliver subcontractor administrative data in electronic format.

1.6.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial number. Prefix correspondence initiated by the Contractor's site office with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters must be numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C".

1.6.1.4 Equipment

Contain within the Contractor's RMS database a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.6.1.5 Management Reporting

RMS includes a number of reports that Contractor management can use to track the status of the project. The value of these reports is reflective of the quality of the data input, and is maintained in the various sections of RMS. Among these reports are: Progress Payment Request worksheet, QA/QC comments, Submittal Register Status, Three-Phase Control checklists.

1.6.1.6 Request For Information (RFI)

Exchange all Requests For Information (RFI) using the Built-in RFI generator and tracker in RMS.

1.6.2 Finances

1.6.2.1 Pay Activity Data

Include within the RMS database a list of pay activities that the Contractor must develop in conjunction with the construction schedule. The sum of all pay activities must be equal to the total contract amount, including modifications. Group pay activities Contract Line Item Number (CLIN); the sum of the activities must equal the amount of each CLIN. The total of all CLINs equals the Contract Amount.

1.6.2.2 Payment Requests

Prepare all progress payment requests using RMS. Complete the payment request worksheet, prompt payment certification, and payment invoice in RMS. Update the work completed under the contract, measured as percent or as specific quantities, at least monthly. After the update, generate a payment request report using RMS. Submit the payment request, prompt payment certification, and payment invoice with supporting data using RMS CM. If permitted by the Contracting Officer, email or an optical disk may be used. A signed paper copy of the approved payment request is also required, which will govern in the event of discrepancy with the electronic version.

1.6.3 Quality Control (QC)

RMS provides a means to track implementation of the 3-phase QC Control System, prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements. Maintain this data on a daily basis. Entered data will automatically output to the RMS generated daily report. Provide the Government a Contractor Quality Control (CQC) Plan within the time required in Section 01 45 00.00 10 QUALITY CONTROL. Within seven calendar days of Government acceptance, submit a RMS update reflecting the information contained in the accepted CQC Plan: schedule, pay activities, features of work, submittal register, QC requirements, and equipment list.

1.6.3.1 Daily Contractor Quality Control (CQC) Reports.

RMS includes the means to produce the Daily CQC Report. The Contractor may use other formats to record basic QC data. However, the Daily CQC Report generated by RMS must be the Contractor's official report. Summarize data from any supplemental reports by the Contractor and consolidate onto the RMS-

generated Daily CQC Report. The Daily CQC Report shall include the following information at a minimum:

- a. Project Name
- b. Date
- c. Weather
- d. Hours Worked
- e. Downtime or Delays
- f. Personnel Onsite
- g. Planned Activities
- h. Summary of work performed (including but not limited to):
 1. Approximate CY dredged, where dredged, and type of dredging performed
 2. Approximate gallons of water treated
 3. Number of loads taken offsite and destination of loads
 4. Number of confirmation samples collected and where
 5. Quantity and location of dredged sediment placed at Wisconsin Point Landfill
 6. Quantity and location of cover material placed.
 7. Debris encountered
- i. Major Deliveries Received (blending materials/cover sand/topsoil/other)
- j. Ongoing Monitoring Performed
 1. Turbidity / air / other
 2. Monitoring results at or near action levels
- k. Operational Issues
 1. Direction Received from USACE Construction Representative
- m. Safety and Health Issues
- n. Site Visitors
- o. Photographs

Submit Daily CQC Reports as required by Section 01 45 00.00 10 QUALITY CONTROL. Electronically submit reports to the Government within 24 hours after the date covered by the report. Also provide the Government a signed, printed copy of the Daily CQC Report.

1.6.3.2 Deficiency Tracking.

Use RMS to track deficiencies. Deficiencies identified by the Contractor will be numerically tracked using QC punch list items. Maintain a current log of its QC punch list items in the RMS database. The Government will log the deficiencies it has identified using its QA punch list items. The Government's QA punch list items will be included in its export file to the Contractor. Regularly update the correction status of both QC and QA punch list items.

1.6.3.3 QC Requirements

Develop and maintain a complete list of QC testing and required structural and life safety special inspections required by the International Code Council (ICC), transferred and installed property, and user training requirements in RMS. Update all data on these QC requirements as work progresses, and promptly provide this information to the Government via RMS.

1.6.3.4 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in RMS.

1.6.3.5 Labor and Equipment Hours

Log labor and equipment exposure hours on a daily basis. This data will be rolled up into a monthly exposure report.

1.6.3.6 Accident/Safety Reporting

The Government will issue safety comments, directions, or guidance whenever safety deficiencies are observed. The Government's safety comments will be included in its export file to the Contractor. Regularly update the correction status of the safety comments. In addition, utilize RMS to advise the Government of any accidents occurring on the jobsite. This brief supplemental entry is not to be considered as a substitute for completion of mandatory reports, e.g., ENG Form 3394 and OSHA Form 300.

1.6.3.7 Features of Work

Include a complete list of the features of work in the RMS database. A feature of work may be associated with multiple pay activities. However, each pay activity (see subparagraph "Pay Activity Data" of paragraph "Finances") will only be linked to a single feature of work.

1.6.3.8 Hazard Analysis

Use RMS CM to develop a hazard analysis for each feature of work included in the CQC Plan. The Activity Hazard Analysis will include information required by EM 385-1-1, paragraph 01.A.13.

1.6.4 Submittal Management

The Government will provide the initial submittal register in electronic format. Thereafter, maintain a complete list of all submittals, including completion of all data columns. Dates on which submittals are received and returned by the Government will be included. Use RMS CM to track and transmit all submittals. ENG Form 4025, submittal transmittal form, and the submittal register update must be produced using RMS. RMS will be used to update, store and exchange submittal registers and transmittals. In addition to requirements stated in specification 01 33 00, actual submittals are to be stored in RMS CM, with hard copies also provided. Exception will be where the Contracting Officer specifies only hard copies required, where size of document cannot be saved in RMS CM, and where samples, spare parts, color boards, and full size drawings are to be provided.

1.6.5 Schedule

Develop a construction schedule consisting of pay activities, in accordance with Section 01 32 01.00 10 PROJECT SCHEDULE. Input and maintain in the RMS database this schedule either manually or by using the Standard Data Exchange Format (SDEF) (see Section 01 32 01.00 10 PROJECT SCHEDULE). Include with each pay request the updated schedule. Provide electronic copies of transmittals.

1.6.6 Import/Export of Data

RMS includes the ability to export Contractor data to the Government and to import submittal register and other Government-provided data from RMS, and schedule data using SDEF.

1.7 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submittals with an "S" are for inclusion in the Sustainability Notebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-06 Test Reports

Daily CQC Reports

1.8 IMPLEMENTATION

Contractor use of RMS CM as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain its RMS CM database, and to provide the Government with regular database updates. RMS CM shall be an integral part of the Contractor's management of quality control.

1.9 MONTHLY COORDINATION MEETING

Update the RMS CM database each workday. At least monthly, generate and submit a schedule update. At least one week prior to submittal, meet with the Government representative to review the planned progress payment data submission for errors and omissions.

Make all required corrections prior to Government acceptance of the export file and progress payment request. Payment requests accompanied by incomplete or incorrect data submittals will not be accepted. The Government will not process progress payments until all required corrections are processed.

1.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the requirements of this specification. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS
11/15

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

CITY OF SUPERIOR, WISCONSIN CODE OF ORDINANCES (SUPERIOR CODE)

- | | |
|----------------------------|---|
| Sec. 34-191 through 34-220 | (March 1, 2016) Site Erosion Controls |
| Sec. 34-221 through 34-250 | (March 1, 2016) Long-Term Stormwater Management |

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES

- | | |
|---------------------|---|
| NR 40 | (April 2015) Invasive Species Identification, Classification and Control |
| NR 151 | (June 2018) Runoff Management |
| Manual Code #9183.1 | (June 16, 2016) Boat, Gear, and Equipment Decontamination and Disinfection Protocol |

STATE OF WISCONSIN STATUTES (WIS. STATUES)

- | | |
|-------------|---------------------------------|
| Chapter 281 | Water and Sewage |
| Chapter 283 | Pollution Discharge Elimination |

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

- | | |
|-----------------|---|
| 29 CFR 1910.120 | Hazardous Waste Operations and Emergency Response |
| 33 CFR 320-330 | General Regulatory Policies, Permits, Enforcement and Definitions |
| 40 CFR 112 | Oil Pollution Prevention |
| 40 CFR 122.26 | Storm Water Discharges (Applicable to State NPDES Programs, see section 123.25) |
| 40 CFR 233 | State Program Regulations |
| 40 CFR 241 | Guidelines for Disposal of Solid Waste |

Howards Bay SND and GLLA Dredging
AS AWARDED

40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 268	Land Disposal Restrictions
40 CFR 273	Standards For Universal Waste Management
40 CFR 273.2	Standards for Universal Waste Management - Batteries
40 CFR 273.4	Standards for Universal Waste Management - Mercury Containing Equipment
40 CFR 273.5	Standards for Universal Waste Management - Lamps
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 300.125	National Oil and Hazardous Substances Pollution Contingency Plan - Notification and Communications
40 CFR 355	Emergency Planning and Notification
40 CFR 403	General Pretreatment Regulations for Existing and New Sources of Pollution
40 CFR 50	National Primary and Secondary Ambient Air Quality Standards
40 CFR 64	Compliance Assurance Monitoring
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

1.2 DEFINITIONS

1.2.1 Contractor Generated Hazardous Waste

Contractor generated hazardous waste is materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene), waste thinners, excess paints, excess solvents, waste solvents, excess pesticides, and contaminated pesticide equipment rinse water.

1.2.2 Electronics Waste

Electronics waste is discarded electronic devices intended for salvage, recycling, or disposal.

1.2.3 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally or historically.

1.2.4 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.5 Hazardous Debris

As defined in paragraph SOLID WASTE, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) in accordance with 40 CFR 261. Hazardous debris also includes debris that exhibits a characteristic of hazardous waste in accordance with 40 CFR 261.

1.2.6 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that: Is regulated as a hazardous material in accordance with 49 CFR 173; or requires a Safety Data Sheet (SDS) in accordance with 29 CFR 1910.120; or during end use, treatment, handling, packaging, storage, transportation, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D. Designation of a material by this definition, when separately regulated or controlled by other sections or directives, does not eliminate the need for adherence to that hazard-specific

guidance which takes precedence over this section for "control" purposes. Such material includes ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs).

1.2.7 Hazardous Waste

Hazardous Waste is any material that meets the definition of a solid waste and exhibit a hazardous characteristic (ignitability, corrosivity, reactivity, or toxicity) as specified in 40 CFR 261, Subpart C, or contains a listed hazardous waste as identified in 40 CFR 261, Subpart D.

1.2.8 Municipal Separate Storm Sewer System (MS4) Permit

MS4 permits are those held by installations to obtain NPDES permit coverage for their stormwater discharges.

1.2.9 National Pollutant Discharge Elimination System (NPDES)

The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

1.2.10 Oily Waste

Oily waste are those materials that are, or were, mixed with Petroleum, Oils, and Lubricants (POLs) and have become separated from that POLs. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, POLs and may be appropriately tested and discarded in a manner which is in compliance with other state and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that: It is not prohibited in other state regulations or local ordinances; the amount generated is "de minimus" (a small amount); it is the result of minor leaks or spills resulting from normal process operations; and free-flowing oil has been removed to the practicable extent possible. Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, perform a hazardous waste determination prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.2.11 Regulated Waste

Regulated waste are solid wastes that have specific additional federal, state, or local controls for handling, storage, or disposal.

1.2.12 Sediment

Sediment is soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.13 Solid Waste

Solid waste is a solid, liquid, semi-solid or contained gaseous waste. A solid waste can be a hazardous waste, non-hazardous waste, or non-Resource Conservation and Recovery Act (RCRA) regulated waste. Types of solid waste typically generated at construction sites may include:

1.2.13.1 Debris

Debris is non-hazardous solid material generated during the construction, demolition, or renovation of a structure that exceeds 2.5-inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (for example, cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may not be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

1.2.13.2 Green Waste

Green waste is the vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.

1.2.13.3 Material not regulated as solid waste

Material not regulated as solid waste is nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

1.2.13.4 Non-Hazardous Waste

Non-hazardous waste is waste that is excluded from, or does not meet, hazardous waste criteria in accordance with 40 CFR 263.

1.2.13.5 Surplus Soil

Surplus soil is existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars, and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included and must be managed in accordance with paragraph HAZARDOUS MATERIAL MANAGEMENT.

1.2.13.6 Scrap Metal

This includes scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe, and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.

1.2.13.7 Wood

Wood is dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated or painted wood that meets the definition of lead contaminated or

lead based contaminated paint is not included. Treated wood includes, but is not limited to, lumber, utility poles, crossties, and other wood products with chemical treatment.

1.2.15 Surface Discharge

Surface discharge means discharge of water into drainage ditches, storm sewers, creeks or "waters of the United States". Surface discharges are discrete, identifiable sources and require a permit from the governing agency. Comply with federal, state, and local laws and regulations.

1.2.16 Wastewater

Wastewater is the used water and solids from a community that flow to a treatment plant.

1.2.16.1 Stormwater

Stormwater is any precipitation in an urban or suburban area that does not evaporate or soak into the ground, but instead collects and flows into storm drains, rivers, and streams. Stormwater that comes into contact with potentially impacted material from environmental dredging operations is classified as construction water.

1.2.16.2 Construction Water

Construction water is any water that comes into contact with potentially impacted material generated during environmental dredging operations. Construction water includes but is not limited to: water that collects in barges due to dredging or direct precipitation; water that collects in material handling pads from dewatering efforts or direct precipitation; water that collects within the treatment system pad including direct precipitation; and decontamination water. Construction water must be collected and treated at the onsite treatment facility in accordance with Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

1.2.17 Waters of the United States

Waters of the United States means Federally jurisdictional waters, including wetlands, that are subject to regulation under Section 404 of the Clean Water Act or navigable waters, as defined under the Rivers and Harbors Act.

1.2.18 Wetlands

Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

1.2.19 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (for example, thermostats), and lamps (for example, fluorescent bulbs). The rule is designed to reduce hazardous waste in the municipal solid waste (MSW) stream by making it easier for universal waste handlers to collect these items and send them for recycling or proper disposal. These regulations can be found at

40 CFR 273.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preconstruction Documentation

Environmental Protection Plan; G-AOF

Stormwater Notice of Intent (for NPDES coverage under the general permit for construction activities); G-AOF

Dirt and Dust Control Plan; G-AOF

SD-06 Test Reports

Inspection Reports

Perimeter Air Monitoring Reports

SD-11 Closeout Submittals

Erosion Control and Stormwater Management Compliance Notebook; G-AOF

Stormwater Notice of Termination; G-AOF

Waste Determination Documentation; G-AOF

Disposal Documentation for Hazardous and Regulated Waste; G-AOF

Solid Waste Management Report; G-AOF

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this Contract. Comply with federal, state, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

Tests and procedures assessing whether construction operations comply with Applicable Environmental Laws may be required. Analytical work must be performed by qualified laboratories; and where required by law, the laboratories must be certified.

1.5 SPECIAL ENVIRONMENTAL REQUIREMENTS

1.5.1 Control of Non-Indigenous Aquatic Nuisance Species

The Contractor shall conduct diligent operating practices to prevent the spread of Aquatic Nuisance Species (ANS) from one location to another on the Great Lakes, or from one waterbody to another. Such practices shall include, but not be limited to, cleaning equipment and watercraft (prior to it's being brought to the project site and prior to its removal when no longer needed at the site) to prevent the spread of seeds, eggs, larvae, soil, plant material, or other dispersal vectors; and discharging or exchanging ballast water or other water from a vessel of any type only at a location where the chances for survival of ANS are minimal, such as at cold, deep regions of the Great Lake which are far from shore. Comply with NR 40.02 and Manual Code #9183.1.

1.6 QUALITY ASSURANCE

1.6.1 Preconstruction Documentation and Protection of Features

This paragraph supplements the Contract Clause 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, complete Preconstruction Documentation of the project site with the Contracting Officer, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record. Include in the report a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned staging area and access route(s), as applicable. The Contractor and the Contracting Officer will sign this report upon mutual agreement regarding its accuracy and completeness. Protect those environmental features included in the report and any indicated on the drawings, regardless of interference that their preservation may cause to the work under the Contract.

1.6.2 Environmental Brief

Attend an environmental brief to be included in the preconstruction meeting. Provide the following information: types and quantities of wastes/wastewater that may be generated during the Contract. Discuss the results of the Preconstruction Documentation at this time.

Prior to initiating any work on site, meet with the Contracting Officer to discuss the proposed Environmental Protection Plan (EPP). Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural and cultural resources, required reports, required permits, permit requirements (such as mitigation measures), and other measures to be taken.

1.6.3 Non-Compliance Notifications

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with federal, state or local environmental laws or regulations, permits, and other elements of the Contractor's EPP. After receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting

Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

1.7 ENVIRONMENTAL PROTECTION PLAN

The purpose of the EPP is to present an overview of known or potential environmental issues that must be considered and addressed during construction. Include in the EPP measures for protecting natural and cultural resources, required reports, and other measures to be taken. Meet with the Contracting Officer or Contracting Officer Representative to discuss the EPP and develop a mutual understanding relative to the details for environmental protection including measures for protecting natural resources, required reports, and other measures to be taken. Submit the EPP within 15 calendar days after notice to proceed and not less than 10 calendar days before the preconstruction meeting. Revise the EPP throughout the project to include any reporting requirements, changes in site conditions, or contract modifications that change the project scope of work in a way that could have an environmental impact. No requirement in this section will relieve the Contractor of any applicable federal, state, and local environmental protection laws and regulations. During Construction, identify, implement, and submit for approval any additional requirements to be included in the EPP. Maintain the current version onsite.

The EPP includes the following elements:

1.7.1 General Overview and Purpose

1.7.1.1 Descriptions

A brief description of each specific plan required by environmental permit or elsewhere in this Contract such as erosion control and storm water management plan, spill control plan, solid waste management plan, wastewater management plan, air pollution control plan, contaminant prevention plan, a historical, archaeological, cultural resources, biological resources and wetlands plan, traffic control plan Hazardous, Non-Hazardous Solid Waste Disposal Plan borrowing material plan.

1.7.1.2 Duties

The duties and level of authority assigned to the person(s) on the job site who oversee environmental compliance, such as who is responsible for adherence to the EPP, who is responsible for spill cleanup and training personnel on spill response procedures, who is responsible for manifesting hazardous waste to be removed from the site (if applicable), and who is responsible for training the Contractor's environmental protection personnel.

1.7.1.3 Procedures

A copy of any standard or project-specific operating procedures that will be used to effectively manage and protect the environment on the project site.

1.7.1.4 Communications

Communication and training procedures that will be used to convey environmental management requirements to Contractor employees and

subcontractors.

1.7.1.5 Contact Information

Emergency contact information, contact information (office phone number, cell phone number, and e-mail address).

1.7.2 General Site Information

1.7.2.1 Drawings

Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, jurisdictional wetlands, material staging areas, structures, sanitary facilities, storm drains and conveyances, and stockpiles of excess soil.

1.7.2.2 Work Area

Work area plan showing the proposed activity in each portion of the area and identify the areas of limited use or nonuse. Include measures for marking the limits of use areas, including methods for protection of features to be preserved within authorized work areas and methods to control runoff and to contain materials on site, and a traffic control plan.

1.7.3 Management of Natural Resources

- a. Land resources
- b. Tree protection
- c. Replacement of damaged landscape features
- d. Temporary construction
- e. Stream crossings
- f. Fish and wildlife resources
- g. Wetland areas

1.7.4 Protection of Historical and Archaeological Resources

- a. Objectives
- b. Methods

1.7.5 Stormwater Management and Control

- a. Ground cover
- b. Erodible soils
- c. Temporary measures
 - (1) Structural Practices
 - (2) Temporary and permanent stabilization
- d. Effective selection, implementation and maintenance of Best Management

Practices (BMPs).

1.7.6 Protection of the Environment from Waste Derived from Contractor Operations

Control and disposal of solid and sanitary waste. Control and disposal of hazardous waste.

This item consist of the management procedures for hazardous waste to be generated. As a minimum, include the following:

- a. List of the types of hazardous wastes expected to be generated
- b. Procedures to ensure a written waste determination is made for appropriate wastes that are to be generated
- c. Sampling/analysis plan, including laboratory method(s) that will be used for waste determinations and copies of relevant laboratory certifications
- d. Methods and proposed locations for hazardous waste accumulation/storage (that is, in tanks or containers)
- e. Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted)
- f. Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268)
- g. Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and similar
- h. Used oil management procedures in accordance with 40 CFR 279; Hazardous waste minimization procedures
- i. Plans for the disposal of hazardous waste by permitted facilities; and Procedures to be employed to ensure required employee training records are maintained.

1.7.7 Prevention of Releases to the Environment Procedures

to prevent releases to the environment Notifications in the event of a release to the environment

1.7.8 Regulatory Notification and Permits

List what notifications and permit applications must be made. Demonstrate that those permits have been obtained or applied for by including copies of applicable environmental permits. The EPP will not be approved until the permits have been obtained.

1.7.9 Clean Air Act Compliance

1.7.9.1 Haul Route

Submit truck and material haul routes along with a Dirt and Dust Control Plan

for controlling dirt, debris, and dust. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

1.7.9.2 Pollution Generating Equipment

Identify air pollution generating equipment or processes that may require federal, state, or local permits under the Clean Air Act. Provide a list of all fixed or mobile equipment, machinery or operations that could generate air emissions during the project to the COR.

1.7.9.3 Fugitive Dust Control

Visually monitor for fugitive dust migration during work activities that may generate fugitive dust. If visual monitoring indicates that dust migration from work areas is occurring during active construction (e.g., staging area, Wisconsin Point landfill), implement dust suppression techniques.

1.7.9.4 Community Air Monitoring

For the protection of public health, monitor and control emissions to the air from remedial action activities at the sediment staging area (Fraser property) to minimize short-term risks that might be posed to the community during implementation of the remedial alternative in accordance with the following.

1.7.9.4.1 Perimeter Air Monitoring Action Levels

Parameter	Perimeter Reading (15-minute average)	Action
Flammable Vapors, Lower Explosive Limit (LEL)	< 10% LEL	Normal operations.
	≥ 10% LEL	Stop work, ventilate area, investigate source of vapors. Notify Contracting Officer immediately. Take measurement at each perimeter location every 30 minutes until normal range is achieved.
Airborne Particulates (above upwind location)	0 to < 100 microgram per cubic meter (µg/m ³)	Normal operations; continue continuous perimeter monitoring.
	100 µg/m ³ - 150 µg/m ³	Initiate dust suppression measures. Notify Contracting Officer. Continue continuous perimeter monitoring.
	≥ 150 µg/m ³	Continue dust suppression measures; if suppression measures are insufficient to reduce particulates below 150 µg/m ³ , cease work. Notify Contracting Officer. Continue continuous perimeter monitoring.

1.7.9.4.2 Perimeter Air Monitoring Locations

Perform real-time airborne particulate monitoring at the Frasier property continuously during sediment handling activities, including sediment and blending agent handling activities. Perform air monitoring at perimeter of work area at two downwind locations and one upwind location. Upwind and downwind locations shall be determined daily through observations at the site or available meteorological data and located to allow coverage of potential receptors and typical shifts in the wind direction. If wind direction shifts

greater than +/- 60° compass change from the original wind direction during the workday, the monitoring stations shall be relocated so that the upwind and downwind locations are maintained. Monitoring location changes shall be documented in a field logbook.

1.7.9.4.3 Monitoring Instruments

Perimeter air monitoring shall be performed using real-time particulate and air quality monitoring system; or hand-held, direct-reading survey instruments; or both. The meters selected for use during monitoring activities shall be capable of calculating and recording 15-minute running average concentrations for comparison against action levels. Flammable vapor monitoring shall be conducted at each monitoring location using a photoionization detector (PID) with an 11.7 eV bulb or an equivalent systems capable of being safely operated under expected site conditions and capable of detecting flammable vapors including large hydrocarbons/VOC at a sufficient level for the specified monitoring application. Particulate monitoring shall be conducted at each monitoring location using instrumentation equipped with electronic data-logging capabilities such as a PDR1000 (from Thermo Electron Corporation) or equivalent. At least one spare flammable vapor monitoring device and particulate monitor shall be available for use in the event of equipment failure.

1.7.9.4.3.1 Instrument Calibration and Maintenance

All air monitoring equipment shall be maintained and calibrated in accordance with specific manufacturers' procedures. Preventive maintenance and repairs shall be conducted in accordance with the respective manufacturers' procedures. All direct-reading instrumentation calibrations shall be conducted under the approximate environmental conditions in which the instrument will be used. Instruments must be calibrated before and after use, noting the reading(s) and any adjustments that are necessary. All air monitoring equipment calibration, including the standard used for calibration, must be documented on a calibration log. When applicable, only manufacturer-trained and/or authorized personnel shall be allowed to perform instrument repairs.

1.7.9.4.4 Staffing

Contractor's Environmental Sampler performing perimeter air monitoring shall be qualified in the calibration and operation of the required air monitoring equipment and meet the requirements of SECTION 01 35 45.00 10 CHEMICAL DATA QUALITY CONTROL.

1.7.9.4.5 Documentation and Reporting

Maintain perimeter air monitoring data and make available for review by Contracting Officer. Include summary in Daily CQC Report and submit Perimeter Air Monitoring Reports on a weekly basis that includes the following information:

1. Reporting period
2. Alert and Action Levels for the project
3. Site-related activities conducted during the reporting period
4. Meteorological data for reporting period
5. Daily maximum 15-minute average concentrations for monitored parameters at each station

6. Elevated concentrations triggering Alert or Action conditions and corrective measures/actions implemented (if any)

1.8 LICENSES AND PERMITS

Obtain licenses and permits required for the construction of the project and in accordance with clause 52.236-7 PERMITS AND RESPONSIBILITIES. Notify the Government of all general use permitted equipment the Contractor plans to use on site. This paragraph supplements the Contractor's responsibility under clause 52.236-7 PERMITS AND RESPONSIBILITIES.

1.9 Solid Waste Management Report

Monthly, submit a solid waste disposal report to the Contracting Officer. For each waste, the report will state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste.

1.10 REGULATORY REQUIREMENTS

1.10.1 Work Subject to the Clean Water Act, Section 401(a)

Any activity that may result in discharge into navigable waters is not allowed unless a Section 401(a) Water Quality Certification is obtained from the State. Examples of activities that are not allowed without a permit include surface discharge from stockpiling at a transfer site, and barge overflow. If obtained by the Government, the 401(a) Water Quality Certification is provided in the task order.

1.10.2 Additional Work Proposed and Not Authorized

1.10.2.1 Work Subject to 33 CFR 320-330

Any additional work (not specifically shown on the plans or delineated in the specifications) proposed by the Contractor in or affecting navigable waters, including wetlands (as defined in 33 CFR 320-330, published in the Federal Register Vol.51, No. 219, Thursday, November 13, 1986) shall not be performed without a Department of the Army Permit. This requirement shall be applicable to all work, permanent or temporary, and/or fill(s). The Department of the Army Permit shall be approved by the District Engineer or Deputy District Engineer in accordance with the laws of the United States and the regulations promulgated thereunder, including, but not limited to, the River and Harbor Act of 1899, the Clean Water Act and the National Environmental Policy Act of 1969, as amended. Corps employees (Contracting Officer's Representatives (COR) or inspectors) are not delegated authority to authorize such work. Information on making application for such permit(s) may be obtained by contacting one of the offices as listed hereinafter. When applying for information or a permit, a copy of any correspondence should be directed to the Contracting Officer of this contract. If a permit is not obtained, the additional work cannot be accomplished. Any delay in processing the permit will not constitute the basis of a claim under this contract. The fact that the Contractor is performing work under a Department of the Army Contract will give the Contractor no greater rights than any other applicant for a Department of the Army Permit.

WISCONSIN-MINNESOTA

Regulatory Functions Branch
Construction-Operations Division

Howards Bay SND and GLLA Dredging
AS AWARDED

U.S. Army Engineer District, St. Paul
190 Fifth Street East St.
Paul, MN 55101
Telephone: 651-290-5376

1.10.2.2 Work Subject to 40 CFR 233

Any additional work (not specifically shown on the plans or included in the specifications), proposed by the Contractor, in or affecting waters of the United States, including wetlands (as defined in 40 CFR 233, published in the Federal Register, Vol. 49 No. 192, Tuesday October 2, 1984) shall not be performed without a State regulatory permit. Information on making an application for such permit may be obtained by contacting the office listed hereinafter. When applying for a permit or for information, a copy of any correspondence shall be furnished to the Contracting Officer. If a permit is not obtained, the additional work shall not be performed. Any delay in obtaining or processing the permit will not constitute a basis for a claim under this contract.

STATE OF MINNESOTA

Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155-4194
Telephone: 651-296-6300

STATE OF WISCONSIN

Department of Natural
Resources
101 S. Webster St.
P.O. Box 7921
Madison, WI 53707-7921
Telephone: 608-266-2621

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitats. The protection of rare, threatened, and endangered animal and plant species identified, including their habitats, is the Contractor's responsibility.

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work as specified. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 Protection of Birds

Many of the birds found at the disposal facilities, placement areas, and other project areas are protected by the Migratory Bird Treaty Act (16 U.S.C. 703-712, July 3, 1918, as amended). The Act makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or

eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations. According to the Act, a person, association, partnership or corporation which violates the Act or its regulations is guilty of a misdemeanor and subject to a fines, jail time, or both.

3.1.2 Allowed and Prohibited Dredging Periods

The following environmental dredging restrictions apply for this contract:

Dredging is allowed starting 1 May until no longer viable due to winter weather.

3.1.3 Flow Ways

Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as specified and permitted.

3.1.4 Vegetation

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor is responsible for any resultant damage.

Protect existing trees that are to remain to ensure they are not injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. Coordinate with the Contracting Officer to determine appropriate action for trees and other landscape features scarred or damaged by equipment operations.

3.1.5 Streams

Stream crossings must allow movement of materials or equipment without violating water pollution control standards of the federal, state, and local governments. Construction of stream crossing structures must be in compliance with any required permits including Clean Water Act Section 404, and Section 401 Water Quality.

The Contracting Officer's approval and appropriate permits are required before any equipment will be permitted to ford live streams. In areas where frequent crossings are required, install temporary culverts or bridges. Obtain Contracting Officer's approval prior to installation. Remove temporary culverts or bridges upon completion of work, and repair the area to its original condition unless otherwise required by the Contracting Officer.

3.2 STORMWATER

Do not discharge non-impacted stormwater from construction sites to the sanitary sewer. If the water is noted or suspected of being contaminated (e.g., from processing area), it shall be managed as construction water and must be collected and treated at the onsite treatment facility in accordance with Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Non-impacted stormwater shall be managed as described below.

3.2.1 Construction Permits

Provide the following stormwater related construction permits:

- a. Construction General Permit as required by 40 CFR 122.26, Wis. Statute Chapter 283 and Chapter 281.
- b. Erosion Control/Grading Permit and Stormwater Management Permit from the City of Superior as required by Superior Code Section 34-191 through 34-220 and Section 34-221 through 34-250.

Under the terms and conditions of the permits, install, inspect, maintain BMPs, prepare stormwater erosion and sediment control inspection reports, and submit inspection reports. Maintain construction operations and management in compliance with the terms and conditions of the permits for stormwater discharges from construction activities and Wisconsin Administrative Code NR 151.

3.2.1.1 Erosion Control and Stormwater Management Plan

Submit a project-specific Erosion Control and Stormwater Management Plan (ECSMP) to the Contracting Officer for approval, prior to the commencement of work. The ECSMP must meet the requirements of 40 CFR 122.26; Wis. Statute Chapter 283 and Chapter 281; Superior Code Section 34-191 through 34-220 and Section 34-221 through 34-250; and the permits for stormwater discharges from construction sites.

3.2.1.2 Stormwater Notice of Intent for Construction Activities

Prepare and submit the Notice of Intent for coverage under the stormwater general permit for construction activities to the Contracting Officer for review and approval.

Submit the approved NOI, ESCP, permit application, and appropriate permit fees to the appropriate State and City agency for approval. No land disturbing activities may commence without permit coverage from State and City. Maintain an approved copy of the ECSMP at the onsite construction office, and continually update as regulations require, reflecting current site conditions.

3.2.1.3 Inspection Reports

Submit "Inspection Reports" in accordance with stormwater permits. Erosion control inspection reports may be compiled as part of an erosion control and stormwater management plan inspection reports.

3.2.1.4 Erosion Control and Stormwater Management Compliance Notebook

Create and maintain a three-ring binder of documents that demonstrate compliance with the stormwater permits. Include a copy of the permit Notice of Intent, proof of permit fee payments, ECSMP and ECSMP update amendments, inspection reports and related corrective action records, copies of correspondence with the Permitting Agencies, and a copy of the permit Notice of Termination in the binder. At project completion, the notebook becomes property of the Government. Provide the compliance notebook to the Contracting Officer.

3.2.1.5 Stormwater Notice of Termination for Construction Activities

Submit a Notice of Termination to the Contracting Officer for approval once

construction is complete and final stabilization has been achieved on all portions of the site for which the permittee is responsible. Once approved, submit the Notice of Termination to the appropriate state and city agency.

3.2.2 Erosion and Sediment Control Measures

Provide erosion and sediment control measures in accordance with state and local laws and regulations including NR 151, Sec. 34-191 through 34-220, and Sec. 34-221 through 34-250. Preserve vegetation to the maximum extent practicable. Minimize the area and duration of bare ground to extent practicable. Implement erosion and sediment control measures in accordance with SECTION 31 32 11 SOIL SURFACE EROSION CONTROL.

3.2.3 Work Area Limits

Mark the areas that need not be disturbed under this Contract prior to commencing construction activities. Mark or fence isolated areas within the general work area that are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. Personnel must be knowledgeable of the purpose for marking and protecting particular objects.

3.2.4 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Move or relocate the Contractor facilities only when approved by the Government. Contractor shall coordinate access with work area property owner and comply with all property owner security measures. Provide erosion and sediment controls for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Control temporary excavation and embankments for plant or work areas to protect adjacent areas.

3.2.5 Municipal Separate Storm Sewer System (MS4) Management

Comply with the MS4 permit requirements.

3.3 SURFACE AND GROUNDWATER

3.3.1 Waters of the United States

Do not enter, disturb, destroy, or allow discharge of contaminants into waters of the United States. The protection of waters of the United States shown on the drawings in accordance with paragraph LICENSES AND PERMITS is the Contractor's responsibility.

3.4 PROTECTION OF CULTURAL RESOURCES

3.4.1 Archaeological Resources

If, during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, activities that may damage or alter such resources will be suspended. Resources covered by this paragraph include, but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or

other human activities. Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources. The Government retains ownership and control over archaeological resources.

3.5 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with 40 CFR 64 and state air emission and performance laws and standards.

3.5.1 Burning

Burning is prohibited.

3.5.2 Accidental Venting of Refrigerant

Accidental venting of a refrigerant is a release and must be reported immediately to the Contracting Officer.

3.5.3 EPA Certification Requirements

Heating and air conditioning technicians must be certified through an EPA-approved program. Maintain copies of certifications at the employees' places of business; technicians must carry certification wallet cards, as provided by environmental law.

3.5.4 Dust Control

Keep dust down at all times, including during nonworking periods. Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster.

3.5.4.1 Particulates

Dust particles, aerosols and gaseous by-products from construction activities, and processing and preparation of materials (such as from asphaltic batch plants) must be controlled at all times, including weekends, holidays, and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates that would exceed 40 CFR 50, state, and local air pollution standards or that would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators, or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with state and local visibility regulations.

3.5.5 Odors

Control odors from construction activities. The odors must be in compliance with state regulations and local ordinances and may not constitute a health hazard.

3.6 WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the EPP. Describe the anticipated types of the hazardous materials to be used in the construction when requesting information.

3.6.1 Salvage, Reuse and Recycle

Identify anticipated materials and waste for salvage, reuse, and recycling. Describe actions to promote material reuse, resale or recycling. To the extent practicable, all scrap metal must be sent for reuse or recycling and will not be disposed of in a landfill.

3.7 WASTE MANAGEMENT AND DISPOSAL

3.7.1 Waste Determination Documentation

Complete a Waste Determination form (provided at the pre-construction conference) for Contractor-derived wastes to be generated. All potentially hazardous solid waste streams that are not subject to a specific exclusion or exemption from the hazardous waste regulations (e.g. scrap metal, domestic sewage) or subject to special rules, (lead-acid batteries and precious metals) must be characterized in accordance with the requirements of 40 CFR 261 or corresponding applicable state or local regulations. Base waste determination on user knowledge of the processes and materials used, and analytical data when necessary. Attach support documentation to the Waste Determination form. As a minimum, provide a Waste Determination form for the following waste (this listing is not inclusive): oil- and latex -based painting and caulking products, solvents, adhesives, aerosols, petroleum products, and containers of the original materials.

3.7.2 Solid Waste Management

3.7.2.1 Solid Waste Management Report

Provide copies of the waste handling facilities' weight tickets and receipts.

3.7.2.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers that are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with non-hazardous solid waste. Solid waste disposal offsite must comply with most stringent local, state, and federal requirements, including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

Manage hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, in accordance with 49 CFR 173.

3.7.3 Control and Management of Hazardous Waste

Do not dispose of hazardous waste at the project site. Do not discharge any waste to a sanitary sewer, storm drain, or to surface waters or conduct waste treatment or disposal at the project site without written approval of the Contracting Officer.

3.7.3.1 Hazardous Waste Disposal

3.7.3.2 Universal Waste Management

Manage the following categories of universal waste in accordance with federal, state, and local requirements and installation instructions:

1. Batteries as described in 40 CFR 273.2
2. Lamps as described in 40 CFR 273.5
3. Mercury-containing equipment as described in 40 CFR 273.4

Mercury is prohibited in the construction of this facility, unless specified otherwise, and with the exception of mercury vapor lamps and fluorescent lamps. Dumping of mercury-containing materials and devices such as mercury vapor lamps, fluorescent lamps, and mercury switches, in rubbish containers is prohibited. Remove without breaking, pack to prevent breakage, and transport out of the activity in an unbroken condition for disposal as directed.

3.7.3.3 Electronics End-of-Life Management

Recycle or dispose of electronics waste, including, but not limited to, used electronic devices such computers, monitors, hard-copy devices, televisions, mobile devices, in accordance with 40 CFR 260-262, state, and local requirements, and installation instructions.

3.7.3.4 Disposal Documentation for Hazardous and Regulated Waste

Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

Submit a copy of the applicable EPA and or state permit(s), manifest(s), or license(s) for transportation, treatment, storage, and disposal of hazardous and regulated waste by permitted facilities. Hazardous or toxic waste manifests must be reviewed, signed, and approved by the Contracting Officer before the Contractor may ship waste.

3.7.4 Releases/Spills of Oil and Hazardous Substances

3.7.4.1 Response and Notifications

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated in accordance with 40 CFR 300. Maintain spill cleanup equipment and materials at the work site.

In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release.

In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within

15 minutes) notify the local Fire Department, the Contracting Officer and the state or local authority.

Submit verbal and written notifications as required by the federal (40 CFR 300.125 and 40 CFR 355), state, local regulations and instructions. Provide copies of the written notification and documentation that a verbal notification was made within 20 calendar days. Spill response must be in accordance with 40 CFR 300 and applicable state and local regulations. Contain and clean up these spills without cost to the Government.

3.7.4.2 Clean Up

Clean up hazardous and non-hazardous waste spills. Reimburse the Government for costs incurred including sample analysis materials, clothing, equipment, and labor if the Government will initiate its own spill cleanup procedures, for Contractor- responsible spills, when: Spill cleanup procedures have not begun within one hour of spill discovery/occurrence; or, in the Government's judgment, spill cleanup is inadequate and the spill remains a threat to human health or the environment.

3.7.5 Wastewater

3.7.5.1 Disposal of wastewater must be as specified below.

3.7.5.1.1 Treatment

Do not allow wastewater from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, and forms to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction- related waste water in accordance with Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL, 40 CFR 403, state, regional, and local laws and regulations. Discharge in accordance with discharge permit and federal, state, and local laws and regulations.

3.7.5.1.2 Surface Discharge

For discharge of ground water, Surface discharge in accordance with federal, state, and local laws and regulations.

3.8 HAZARDOUS MATERIAL MANAGEMENT

Include hazardous material control procedures in the Safety Plan, in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Do not bring hazardous material onto project site that does not directly relate to requirements for the performance of this contract. Submit an SDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on the project site. Typical materials requiring SDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. Use hazardous materials in a manner that minimizes the amount of hazardous waste generated. Containers of hazardous materials must have National Fire Protection Association labels or their equivalent. Certify that hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste, in accordance with 40 CFR 261.

3.9 PREVIOUSLY USED EQUIPMENT

Clean previously used construction equipment prior to bringing it onto the project site. Equipment must be free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the U.S. Department of Agriculture jurisdictional office for additional cleaning requirements.

3.10 PETROLEUM, OIL, LUBRICANT (POL) STORAGE AND FUELING

POL products include flammable or combustible liquids, such as gasoline, diesel, lubricating oil, used engine oil, hydraulic oil, mineral oil, and cooking oil. Store POL products and fuel equipment and motor vehicles in a manner that affords the maximum protection against spills into the environment. Manage and store POL products in accordance with EPA 40 CFR 112, and other federal, state, regional, and local laws and regulations. Use secondary containments, dikes, curbs, and other barriers, to prevent POL products from spilling and entering the ground, storm or sewer drains, stormwater ditches or canals, or navigable waters of the United States. Describe in the EPP (see paragraph ENVIRONMENTAL PROTECTION PLAN) how POL tanks and containers must be stored, managed, and inspected and what protections must be provided.

3.10.1 Used Oil Management

Manage used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while onsite exhibits a characteristic of hazardous waste. Used oil containing 1,000 parts per million of solvents is considered a hazardous waste and disposed of at the Contractor's expense. Used oil mixed with a hazardous waste is also considered a hazardous waste. Dispose in accordance with paragraph HAZARDOUS WASTE DISPOSAL.

3.10.2 Oil Storage Including Fuel Tanks

Provide secondary containment and overflow protection for oil storage tanks. A berm used to provide secondary containment must be of sufficient size and strength to contain the contents of the tanks plus 5 inches freeboard for precipitation. Construct the berm to be impervious to oil for 72 hours that no discharge will permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Use drip pans during oil transfer operations; adequate absorbent material must be onsite to clean up any spills and prevent releases to the environment. Cover tanks and drip pans during inclement weather. Provide procedures and equipment to prevent overfilling of tanks. If tanks and containers with an aggregate aboveground capacity greater than 1320 gallons will be used onsite (only containers with a capacity of 55 gallons or greater are counted), provide and implement a SPCC plan meeting the requirements of 40 CFR 112. Do not bring underground storage tanks to the project site for Contractor use during a project. Submit the SPCC plan to the Contracting Officer for approval.

Monitor and remove any rainwater that accumulates in open containment dikes or berms. Inspect the accumulated rainwater prior to draining from a containment dike to the environment, to determine there is no oil sheen present.

3.12 POST CONSTRUCTION CLEANUP

Clean up areas used for construction in accordance with Contract Clause

52.236-12 "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, remove traces of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade parking area and similar temporarily used areas to conform with surrounding contours.

3.13 SOUND INTRUSION

Make the maximum use of low-noise emission products, as certified by the EPA. Blasting or use of explosives are not permitted without written permission from the Contracting Officer, and then only during the designated times. Keep construction activities under surveillance and control to minimize environment damage by noise. Comply with the provisions of the State of Wisconsin rules and local noise ordinances.

3.14 ATTACHMENT

The signed permits attached following this Section's "End of Section" designation are part of this Technical Specification Section.

-- End of Section --

Nationwide Permit



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, ST. PAUL DISTRICT
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

February 14, 2020

Regulatory File No. 2019-02779-WMS

U.S. EPA Great Lakes National Program Office
C/o William Murray
77 W. Jackson Blvd. G-9J
Chicago, Illinois, 60604-3590

Dear Mr. Murry:

We are responding to your request for authorization for the Howards Bay GLLA Sediment Dredging project located in Section 11, Township 49 North, Range 14 West, Douglas County, Wisconsin.

Project authorization:

The regulated activities associated with this project include dredging approximately 75,000 cubic yards of contaminated sediment from 16 acres of Howards Bay in the St. Louis River. The contaminated sediment would be relocated to a temporary upland staging area prior to being transported to the city of Superior's Wisconsin Point Landfill for disposal. The project also includes discharges of fill material below the plane of the ordinary high water mark in approximately 1.1 acres of the St. Louis River for the placement of 6-9 inches of clean sand for areas targeted for enhanced natural recovery.

We have determined that these activities are authorized by a Nationwide Permit (NWP), specifically, NWP 38, Cleanup of Hazardous and Toxic Waste. This work is shown on the enclosed figures, labeled 2019-02779-WMS, Pages 1 of 14 thru Page 14 of 14.

Conditions of your permit:

You must ensure the authorized work is performed in accordance with the enclosed General Permit terms, General Conditions, and St. Paul District Regional Conditions.

You are also required to complete and return the enclosed Compliance Certification form within 30 days of completing your project. Please email the completed form to the contact identified in the last paragraph.

A change in location or project plans may require re-evaluation of your project. Proposed changes should be coordinated with this office prior to construction. Failure to comply with all terms and conditions of this permit invalidates this authorization and could result in a violation of Section 301 of the Clean Water Act or Section 10 of the Rivers and Harbors Act. You must also obtain all local, State, and other Federal permits that apply to this project.

Water Quality Certification:

You must also comply with the enclosed Water Quality Certification conditions associated with this General Permit.

Permit expiration:

This permit is valid until March 18, 2022, unless the general permit is modified, suspended, or revoked. If the work has not been completed by that time, you should contact this office to verify that the permit is still valid. Furthermore, if you commence or are under contract to commence this activity before the date of General Permit expiration, modification, or revocation, you have 12 months to complete the activity under the present terms and conditions of the General Permit.

Jurisdictional determination:

No jurisdictional determination was requested or prepared for this project. While not required, you may request a jurisdictional determination from the contact identified in the last paragraph.

Contact Information:

If you have any questions, please contact me in our Hayward office at (651) 290-5882 or by email at william.m.sande@usace.army.mil.

Sincerely,



William Sande
Lead Project Manager

Enclosures

Cc: Steve LaValley, WDNR (Steven.LaValley@wisconsin.gov)
Paul Allerding, USACE Detroit District (Paul.H.Allerding@usace.army.mil)
Eric Devendorf, Arcadis (eric.devendorf@arcadis.com)



**US Army Corps
of Engineers**®

St. Paul District

COMPLIANCE CERTIFICATION

Regulatory File Number: 2019-02779-WMS

Name of Permittee: U.S. EPA Great Lakes National Program Office
C/o William Murray

County/State: Douglas County, Wisconsin

Date of Issuance: 2/14/2020

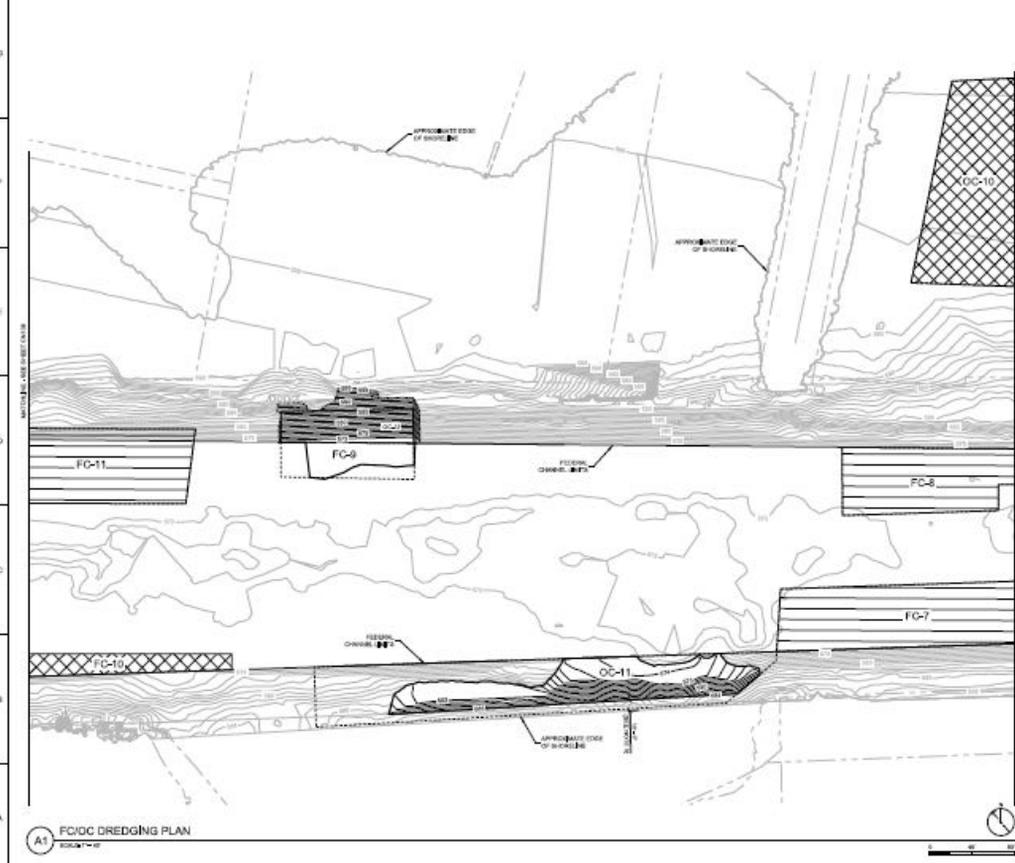
Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the Corps contact identified in your verification letter within 30 days.

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

By signing below, the permittee is certifying that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the permit, and any required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date



GENERAL SHEET NOTES

1. BATHYMETRY HAS BEEN ADJUSTED TO SHOW A REPRESENTATIVE SECTION OF THE FEDERAL CHANNEL. THE FEDERAL CHANNEL FOLLOWING APPROXIMATELY THE CENTERLINE OF THE FEDERAL CHANNEL.
2. DREDGING SHALL OCCUR ONLY TO THE DEPTH INDICATED BY THE DREDGING SYMBOLS. DREDGING SHALL BE PERFORMED TO THE DEPTH INDICATED BY THE DREDGING SYMBOLS. DREDGING SHALL BE PERFORMED TO THE DEPTH INDICATED BY THE DREDGING SYMBOLS.
3. ALL ELEVATIONS ARE REFERENCED TO THE NATIONAL GREAT LAKES DATUM OF 1985 (NGD 85).

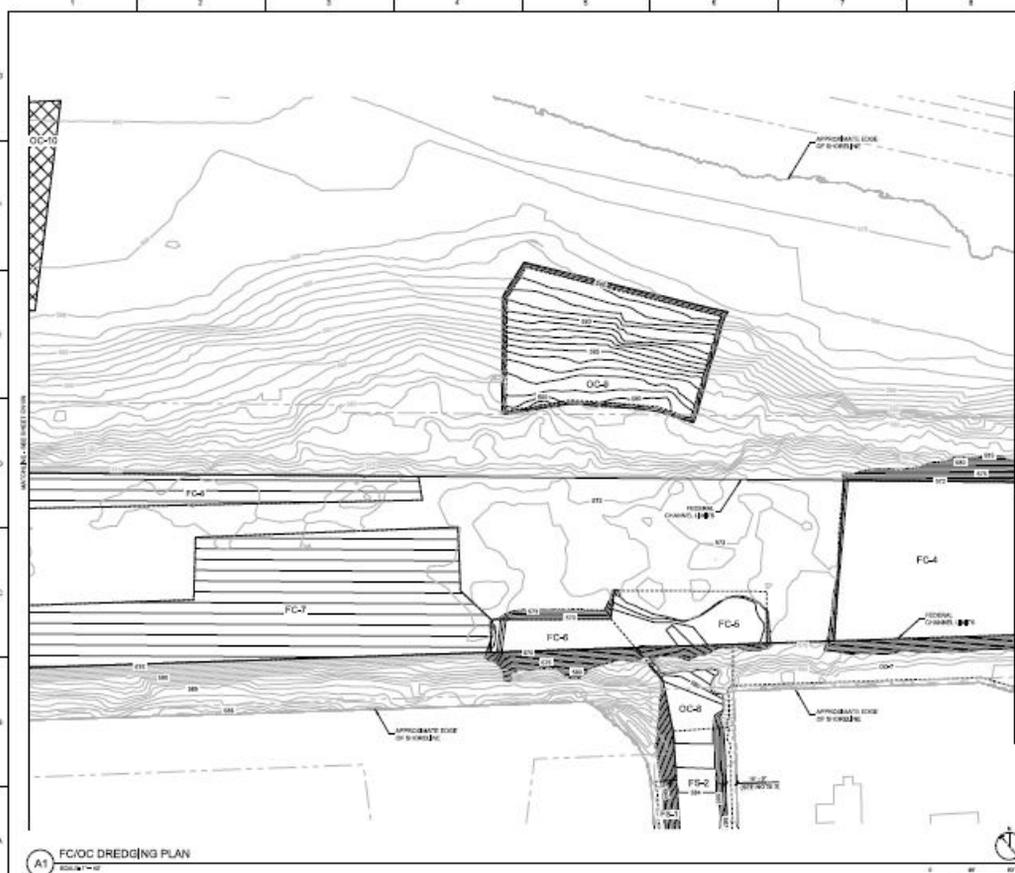
SYMBOLS:

- BATHYMETRIC CONTOUR (SEE NOTE 1)
- FEDERAL CHANNEL
- FEDERAL DAM
- FEDERAL RIGHT-OF-WAY
- FEDERAL EASEMENT
- FEDERAL FLOOD FLOOD

LEGEND:

- BATHYMETRIC CONTOUR (SEE NOTE 1)
- FEDERAL CHANNEL
- FEDERAL DAM
- FEDERAL RIGHT-OF-WAY
- FEDERAL EASEMENT
- FEDERAL FLOOD FLOOD
- DREDGING SYMBOLS (SEE NOTE 2)
- DREDGING MANAGEMENT LINE (DML)
- UNDESIGNED NATURAL RECOVERY AREA
- DAMAGED AREA
- PROPERTY LINE
- ROAD CENTERLINE

188 Army Corps of Engineers
 PROJECT NO. 2019-02779-WMS
 SHEET NO. 11
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 DATE: [Date]
 SCALE: [Scale]
 PROJECT TITLE: [Title]
 SHEET NO.: CN109



GENERAL SHEET NOTES

1. BATHYMETRY HAS BEEN ADJUSTED TO SHOW A REPRESENTATIVE SECTION OF THE FEDERAL CHANNEL. THE FEDERAL CHANNEL FOLLOWING APPROXIMATELY THE CENTERLINE OF THE FEDERAL CHANNEL.
2. DREDGING SHALL OCCUR ONLY TO THE DEPTH INDICATED BY THE DREDGING SYMBOLS. DREDGING SHALL BE PERFORMED TO THE DEPTH INDICATED BY THE DREDGING SYMBOLS. DREDGING SHALL BE PERFORMED TO THE DEPTH INDICATED BY THE DREDGING SYMBOLS.
3. ALL ELEVATIONS ARE REFERENCED TO THE NATIONAL GREAT LAKES DATUM OF 1985 (NGD 85).

SYMBOLS:

- BATHYMETRIC CONTOUR (SEE NOTE 1)
- FEDERAL CHANNEL
- FEDERAL DAM
- FEDERAL RIGHT-OF-WAY
- FEDERAL EASEMENT
- FEDERAL FLOOD FLOOD

LEGEND:

- BATHYMETRIC CONTOUR (SEE NOTE 1)
- FEDERAL CHANNEL
- FEDERAL DAM
- FEDERAL RIGHT-OF-WAY
- FEDERAL EASEMENT
- FEDERAL FLOOD FLOOD
- DREDGING SYMBOLS (SEE NOTE 2)
- DREDGING MANAGEMENT LINE (DML)
- UNDESIGNED NATURAL RECOVERY AREA
- DAMAGED AREA
- PROPERTY LINE
- ROAD CENTERLINE

188 Army Corps of Engineers
 PROJECT NO. 2019-02779-WMS
 SHEET NO. 10
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 DATE: [Date]
 SCALE: [Scale]
 PROJECT TITLE: [Title]
 SHEET NO.: CN110

2017 Nationwide Permits St. Paul District Regional and General Conditions

To qualify for NWP authorization, the prospective permittee must comply with the following regional and general conditions, as applicable, in addition to any regional or case specific conditions imposed by the division engineer or district engineer. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

The following Regional Conditions are applicable to all NWPs:

Nationwide Permit (NWP) Limitations:

- A. **Discretionary authority:** As allowed under 33 CFR 330.1(d), the District retains discretionary authority to require an individual permit of any activity eligible for authorization by a NWP based on concern for the aquatic environment or for any other factor of the public interest.
- B. **Limit on Tributary Impacts:** Any regulated activity that would result in the loss of greater than 500 linear feet of a tributary in a single location is not authorized by a NWP with the exception of projects verified by NWPs 13, 27, 32, 37, 53 or 54 where the permanent alteration would have an overall beneficial effect on the aquatic ecosystem associated with discharges proposed. A waiver from the specifications in this Regional Condition may be requested in writing. The waiver will only be issued if it can be demonstrated that permanent alteration of the tributary would have an overall beneficial effect on the aquatic ecosystem associated with the discharges proposed. This regional condition does not expand the limitations of a specific NWP where that NWP is more restrictive.
- C. **Linear Projects:** No linear utility or linear transportation projects are eligible for authorization by NWPs. These projects will be reviewed for authorization under the St. Paul District's regional or programmatic general permits or an individual permit.
- D. **Great Lakes Compact:** No project or part of a project that would divert more than 10,000 gallons per day of surface or ground water into or out of the Great Lakes Basin is authorized by NWPs.
- E. **Tribal Rights:** As stated in General Condition 17 of the NWPs, no activity may impair tribal rights, including treaty rights, protected tribal resources or tribal lands.
- F. **Areas under a Special Area Management Plan:** Regulated activities located within an area eligible for authorization under a valid Special Area Management Plan with an associated programmatic general permit are ineligible for authorization by NWPs.
- G. **Designated Critical Resource Water:** The Lake Superior National Estuarine Research Reserve is a designated critical resource water and is subject to the NWP limitations and PCN requirements described in General Condition #22 of the NWPs.
- H. **Calcareous fens:**
 - WISCONSIN:** No work in a calcareous fen is authorized by a NWP unless the Wisconsin Department of Natural Resources (WI DNR) has approved an individual permit for the proposed regulated activity. Project proponents must provide evidence of an approved individual permit to the District.
 - MINNESOTA:** No work in a calcareous fen is authorized by a NWP unless the Minnesota Department of Natural Resources (MN DNR) has approved a calcareous fen management plan specific to a project that otherwise qualifies for authorization by a NWP. Project proponents must provide evidence of an approved fen management plan to the District. A list of known Minnesota calcareous fens can be found at: http://files.dnr.state.mn.us/eco/wetlands/calcareous_fen_list.pdf.

Pre-Construction Notification (PCN) Requirements for Specific Water/Places

- I. **PCNs for Special Aquatic Resources:** A project proponent must notify the District by submitting a PCN if a regulated activity would occur in any of the following aquatic resources. **Prior to beginning work in these waters, a District NWP verification letter must be received.**

PROJECTS IN WISCONSIN:

- (1) state-designated wild rice waters (<https://data.glifwc.org/manoomin.harvest.info>);
- (2) coastal plain marshes;
- (3) bog wetland plant communities;
- (4) interdunal wetlands;
- (5) Great Lakes ridge and swale complexes;

The complete Ramsar list is available at (<https://rsis Ramsar.org/>).

More information about plant community types 2-5 listed above, may be obtained from the Wisconsin Department of Natural Resources website at: <http://dnr.wi.gov/topic/EndangeredResources/Communities.asp?mode=group&Type=Wetland>.

Additional information on identifying bog and fen communities can be found at: <http://www.mvp.usace.army.mil/Missions/Regulatory.aspx>.

PROJECTS IN MINNESOTA:

- (1) wild rice waters listed in Appendix A of these conditions and identified in Minn. R. 7050.0470, subpart 1;

Additional information on identifying bog and fen communities can be found at: <http://www.mvp.usace.army.mil/Missions/Regulatory.aspx> and at the MN DNR's Native Plant Community Classification's website: <http://www.dnr.state.mn.us/npc/classification.html>.

- J. **PCNs for Bridges, Structures, and Vessels more than 50 years old:** A project proponent must notify the District by submitting a PCN if work or fill requiring District authorization would affect a bridge, structure or permanently moored or sunken vessels more than 50 years old.
- K. **PCNs for Suspected Sediment or Soil Contamination:** A project proponent must notify the District by submitting a PCN if any regulated activity would occur in areas of known or suspected sediment or soil contamination, including but not limited to Superfund sites. Superfund sites in Minnesota or Wisconsin can be located by searching the EPA's website: <https://www.epa.gov/superfund/search-superfund-sites-where-you-live>. This condition does not apply to NWP 20. Response Operations for Oil or Hazardous Substances.
- L. **PCNs for the Apostle Islands National Lakeshore and Madeline Island:** A project proponent must notify the District by submitting a PCN if the regulated activity would result in the work, fill or placement of a structure within the boundaries of the Apostle Islands National Lakeshore or Madeline Island in Wisconsin. **Prior to beginning regulated activities in these waters, a District NWP verification letter must be received.**
- M. **PCNs for Temporary Impacts:** A project proponent must notify the District by submitting a PCN if temporary impacts would remain in place for longer than 90 days between May 15 and November 15. The PCN must specify how long the temporary impact will remain and include a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions. See also Regional Condition Q.

Mitigation Requirements

- N. **Compensatory Mitigation:** Proposed projects that require a PCN must include a statement describing how permanent *and* temporary impacts to waters of the U.S. would be avoided and minimized. The PCN must also include either: (a) a statement describing how impacts to waters of the U.S. would be compensated in accordance with the Federal Mitigation Rule (33 CFR Part 332) and the current St Paul District Policies for Compensatory Mitigation or (b) a statement explaining why compensatory mitigation should not be required for the proposed impacts.

Site Protection

- O. Site Inspection:** The permittee shall allow representatives from the District to inspect the proposed project site and the authorized activity to ensure that it is being, or has been, constructed and maintained in accordance with the NWP authorization.
- P. Restoration for Temporary Impacts:** All temporary impacts in waters of the U.S., including wetlands, that occur as a result of the regulated activity must be fully contained with appropriate erosion control or containment methods, be restored to preconstruction contours and elevations, and revegetated with native, non-invasive vegetation. A project proponent may request, in writing, a waiver from this condition from the District. An acceptable reason for a waiver to this condition may include, but is not limited to, the District allowing natural restoration of the site when the resulting grade and existing seed bank are sufficient for the site to restore to pre-construction conditions.
- Q. Duration of Temporary Impacts:** Temporary impacts in waters of the U.S., including wetlands, must be avoided and limited to the smallest area and the shortest duration required to accomplish the project purpose.
- PART A, ACTIVITIES WITHOUT PCN REQUIREMENTS:**
Temporary impacts may not remain in place longer than 90 days between May 15 and November 15. Before those 90 days have lapsed all temporary discharges must be removed in their entirety. If the temporary impacts would remain in place for longer than 90 days between May 15 and November 15, a PCN is required and the activity is subject to the requirements and limitations described in part B of this regional condition.
- PART B, ACTIVITIES WITH PCN REQUIREMENTS:**
The PCN must specify how long the temporary impact will remain and include a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions. Temporary impacts are allowed to stay in place as long as specified in the PCN unless otherwise conditioned in a Corps NWP verification. All temporary impacts must be removed in their entirety in accordance with the plan described in the PCN unless otherwise conditioned in a NWP verification provided by the District.
- R. Culverts and Crossings:** Unless a NWP verification authorizes otherwise, replacement and installation of culverts or crossings authorized by a NWP are to follow (or be restored to) the natural alignment and profile of the tributary. The culvert(s) or bridge(s) must adequately pass bedload, sediment load, and provide site-appropriate fish and wildlife passage. Example design elements include recessing single culverts to accommodate natural bankfull width and adjusting additional culvert inverts at an elevation higher than the bankfull elevation.
- S. Best Management Practices:** To minimize adverse effects from soil loss and/or sediment transport that may occur as a result of the authorized discharge and associated earth work, appropriate best management practices shall be maintained and remain in place until the affected area is stabilized with vegetation or ground cover.
- T. Riprap:** For all NWPs that allow for the use of riprap material for bank stabilization, only rock shall be used and it must be of a size sufficient to prevent its movement from the authorized alignment by natural forces under normal or high flows. A project proponent may request from the District, in writing, approval to use alternative riprap materials.
- U. Pollutant or Hazardous Waste Spills:** If a spill of any potential pollutant or hazardous waste occurs, it is the responsibility of the permittee to immediately notify the National Response Center at 1-800-424-8802 or www.nrc.uscg.mil AND
IN WISCONSIN: the Wisconsin Department of Natural Resources' Spills Team at 1-800-943-0003
IN MINNESOTA: the Minnesota State Duty Officer at 1-800-422-0798.
The permittee is responsible for removing such pollutants and hazardous materials and for minimizing any contamination resulting from a spill in accordance with state and federal laws.
- V. Clean Construction Equipment:** All construction equipment must be clean prior to entering and before leaving the work site in order to prevent the spread of invasive species.
- W. Compliance:** The permittee is responsible for ensuring that whoever performs, supervises or oversees any portion of the physical work associated with the construction of the project has a copy of and is familiar with all the terms and conditions of the NWP and any special conditions included in any written verification letter from the District. The permittee is ultimately responsible for ensuring that all the terms and conditions of the NWPs are complied with.

The following General Conditions are applicable to all NWPs:

1. Navigation.

(a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects from Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the preconstruction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or

high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers.

(a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. The permittee shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or Study River (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: <http://www.rivers.gov/>.

17. Tribal Rights. No NWP activity may cause more than minimal adverse effects on tribal rights (including treaty rights), protected tribal resources, or tribal lands.

18. Endangered Species.

(a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless ESA section 7 consultation addressing the effects of the proposed activity has been completed. Direct effects are the immediate effects on listed species and critical habitat caused by the NWP activity. Indirect effects are those effects on listed species and critical habitat that are caused by the NWP activity and are later in time, but still are reasonably certain to occur.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed activity or that utilize the designated critical habitat that might be affected by the proposed activity. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete preconstruction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have "no effect" on listed species or critical habitat, or until ESA section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs.

(e) Authorization of an activity by an NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their World Wide Web pages at <http://www.fws.gov/> or <http://www.fws.gov/ipac> and <http://www.nmfs.noaa.gov/pr/species/esa/> respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting appropriate local office of the U.S. Fish and Wildlife Service to

determine applicable measures to reduce impacts to migratory birds or eagles, including whether "incidental take" permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. Historic Properties.

(a) In cases where the district engineer determines that the activity may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act. If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect. Where the non-Federal applicant has identified historic properties on which the activity might have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed.

(d) For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. Restored riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns.

Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWP, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f)).

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 **Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.**

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature "When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

(Transferee)

(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible

mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

- (a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;
- (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and
- (c) The signature of the permittee certifying the completion of the activity and mitigation. The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a "USACE project"), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission is not authorized by NWP until the appropriate Corps office issues the section 408 permission to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. Pre-Construction Notification.

(a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a preconstruction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

- (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or
- (2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

- (1) Name, address and telephone numbers of the prospective permittee;
- (2) Location of the proposed activity;
- (3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;
- (4) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures. For single and complete linear projects, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);
- (5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;
- (6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.
- (7) For non-Federal permittees, if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed activity or utilize the designated critical habitat that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;
- (8) For non-Federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the "study river" (see general condition 16); and

(10) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the Corps office having jurisdiction over that USACE project.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is an NWP PCN and must include all of the applicable information required in paragraphs (b)(1) through (10) of this general condition. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) Agency Coordination:

(1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for:

(i) all NWP activities that require preconstruction notification and result in the loss of greater than 1/2-acre of waters of the United States;

(ii) NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of stream bed;

(iii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and

(iv) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the district engineer via telephone, facsimile transmission, or e-mail that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

38. Cleanup of Hazardous and Toxic Waste. Specific activities required to effect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority. Court ordered remedial action plans or related settlements are also authorized by this NWP. This NWP does not authorize the establishment of new disposal sites or the expansion of existing sites used for the disposal of hazardous or toxic waste.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 32.) (Authorities: Sections 10 and 404)

Note: Activities undertaken entirely on a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site by authority of CERCLA as approved or required by EPA, are not required to obtain permits under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.

BEFORE THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Application of the United States Department of the Army,
Corps of Engineers, for Water Quality Certification for the
Final Regulations Pertaining to the Issuance, Reissuance,)
and Modification of Nationwide Permits)

On January 6, 2017, the United States Department of the Army, Corps of Engineers (COE), published its final notice regarding the Issuance of Nationwide Permits (NWP) in the Federal Register (agency docket number COE-2015-0017). The publication includes new, existing, and modified NWP. Publication of these NWP serves as the Corps' application to the State for water quality certification (WQC) under Section 401 of the Federal Clean Water Act (CWA).

The Wisconsin Department of Natural Resources (WDNR) has examined the final regulations pursuant to Section 401, CWA, and Chapter NR 299, Wisconsin Administrative Code (Wis. Adm. Code).

The WDNR has determined the following conditions for the NWP are required to ensure compliance with state water quality standards enumerated in s. 299.04, Wis. Adm. Code. The certification contained herein shall expire on March 19, 2022.

Section 401 Certification does not release the permittee from obtaining all other necessary federal, state, and local permits, licenses, certificates, approvals, registrations, charters, or similar forms of permission required by law. It does not limit any other state permit, license, certificate, approval, registration, charter, or similar form of permission required by law that imposes more restrictive requirements. It does not eliminate, waive, or vary the permittee's obligation to comply with all other laws and state statutes and rules throughout the construction, installation, and operation of the project. This Certification does not release the permittee from any liability, penalty, or duty imposed by Wisconsin or federal statutes, regulations, rules, or local ordinances, and it does not convey a property right or an exclusive privilege.

This Certification does not replace or satisfy any environmental review requirements, including those under the Wisconsin Environmental Policy Act (WEPA) or the National Environmental Policy Act (NEPA).

Note: The specific language in the NWP is not included in this document. Copies of complete nationwide permits published in the Federal Register on January 6, 2017, may be obtained from your local COE field office.

STATE CONDITIONS AND LIMITATIONS OF CERTIFICATION

GENERAL CONDITIONS:

1. The permittee shall allow the WDNR reasonable entry and access to the discharge site to inspect the discharge for compliance with the certification and applicable laws.

2. If any of these §401 water quality certification conditions are found invalid or unenforceable, the water quality certification is denied for all activities to which that condition applies.

3. Water quality certification is denied without prejudice for activities involving the temporary stockpiling of dredged or fill material in waters of the state, including wetlands.

4. No discharges of dredged or fill material below the ordinary high water mark of a navigable stream as defined by s. 310.03(5), Wis. Adm. Code, may take place during fish spawning periods or times when nursery areas would be adversely impacted. These periods are:

- September 15th through May 15th for all trout streams and upstream to the first dam or barrier on the Root River (Racine County), the Kewaunee River (Kewaunee County), and Strawberry Creek (Door County). To determine if a waterway is a trout stream, you may use the WDNR website trout maps at <http://dnr.wi.gov/topic/fishing/trout/streammaps.html>.
- March 1st through June 15th for ALL OTHER waters.

5. Unless specifically exempt from state statute and federal Pre-Construction Notification (PCN) requirements, Applicants seeking authorization under these NWP's shall complete the Joint State/Federal Permit Application on the department e-permitting site at <http://dnr.wi.gov/Permits/Water/>.

Nationwide Permits Granted Water Quality Certification:

- NWP 3 – Maintenance
- NWP 4 – Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities
- NWP 5 – Scientific Measurement Devices
- NWP 6 – Survey Activities
- NWP 13 – Bank Stabilization
- NWP 15 – U.S. Coast Guard Approved Bridges
- NWP 16 – Return Water From Upland Contained Disposal Areas
- NWP 18 – Minor Discharges
- NWP 20 – Response Operations for Oil or Hazardous Substances
- NWP 22 – Removal of Vessels
- NWP 25 – Structural Discharges
- NWP 27 – Aquatic Habitat Restoration, Enhancement, and Establishment Activities
- NWP 28 – Modifications of Existing Marinas
- NWP 30 – Moist Soil Management for Wildlife
- NWP 31 – Maintenance of Existing Flood Control Facilities
- NWP 35 – Maintenance Dredging of Existing Basins
- NWP 36 – Boat Ramps
- NWP 37 – Emergency Watershed Protection and Rehabilitation
- NWP 38 – Cleanup of Hazardous and Toxic Waste
- NWP 45 – Repair of Uplands Damaged by Discrete Events
- NWP 53 – Removal of Low-Head Dams
- NWP 54 – Living Shorelines

Nationwide Permits for which Water Quality Certification is Partially Denied

WQC is certified or denied without prejudice as indicated below for the activities authorized by the following NWP. Certified activities are subject to WQC conditions 1-5 above. If activities are denied without prejudice, the applicant must apply to the WDNR for an individual 401 WQC.

- NWP 7 - Outfall Structures and Associated Intake Structures
 - WQC denied: Where the effluent from the outfall is not regulated under the WPDES permit program. WPDES permit information is available at: <http://dnr.wi.gov/topic/wastewater/PermitApplications.html>
 - WQC certified: All other NWP 7 activities.
- NWP 32 - Completed Enforcement Actions
 - WQC denied: If WDNR is not a party to the agreement or if WDNR has not concurred in writing with the settlement agreement.
 - WQC certified: All other NWP 32 activities.
- NWP 39 - Commercial and Institutional Developments
 - WQC denied: Discharges of dredged or fill material for the construction of the following attendant features: yards, recreation facilities, stormwater management facilities or wastewater management facilities.
 - WQC certified: All other NWP 39 activities.
- NWP 41 - Reshaping Existing Drainage Ditches
 - WQC denied: If any portion of the project will occur in or adjacent to a trout stream or any perennial tributaries to a trout stream. To determine if a waterway is a trout stream, you may use the WDNR website trout maps at <http://dnr.wi.gov/topic/fishing/trout/streammaps.html>.
 - WQC certified: All other NWP 41 activities.
- NWP 42 - Recreational Activities
 - WQC denied: If the project involves the placement of any dredged or fill material into Wisconsin navigable waters as defined in s. NR 310.03(5), Wis. Adm. Code.
 - WQC certified: All other NWP 42 activities.
- NWP 44 - Mining Activities
 - WQC denied: If the project involves the placement of any dredged or fill material into Wisconsin navigable waters as defined in s. NR 310.03(5), Wis. Adm. Code.
- NWP 46 - Discharges in Ditches
 - WQC denied: If the project involves the placement of any dredged or fill material into Wisconsin navigable waters as defined in s. NR 310.03(5), Wis. Adm. Code.
 - WQC certified: All other NWP 46 activities.
- NWP 51 - Land-Based Renewable Energy Generation Facilities
 - WQC denied: Discharges of dredged or fill material for the construction of the following attendant features: yards, recreation facilities, stormwater management facilities or wastewater management facilities.
 - WQC certified: All other NWP 51 activities.

Water Quality Certification Is Also Denied for the Nationwide Permits Revoked by the Corps of Engineers in Wisconsin and Listed Below:

- NWP 8 – Oils and Gas Structures on the Outer Continental Shelf
- NWP 12 – Utility Line Activities
- NWP 14 – Linear Transportation Projects
- NWP 15 – U.S. Coast Guard Approved Bridges
- NWP 21 – Surface Coal Mining Activities
- NWP 23 – Approved Categorical Exclusions
- NWP 24 – Indian Tribe or State Administered Section 404 Programs
- NWP 34 – Cranberry Production Activities
- NWP 49 – Coal Re-mining Activities
- NWP 50 – Underground Coal Mining Activities

Nationwide Permits Denied Water Quality Certification Without Prejudice At This Time:

The following NWP categories are denied Water Quality Certification (WQC) in their entirety and require an individual Section 401 WQC for all activities under these NWPs. In instances where a state has denied the 401 WQC for discharges under a particular NWP, permittees must furnish the District Engineer for the COE with an individual 401 WQC.

Each category was reviewed and it was determined that: potential water quality and beneficial use impacts would be beyond that considered minimal; the activity was not likely to occur in Wisconsin; the NWP doesn't align with state general permit standards required by statute (NWP 29, 40, 43); inadequate data was available for WDNR to fully evaluate potential water quality and beneficial use impacts; or the category was empty (Reserved).

- NWP 17 – Hydropower Projects
- NWP 19 – Minor Dredging
- NWP 26 – Reserved
- NWP 29 – Residential Developments
- NWP 33 – Temporary Construction, Access and Dewatering
- NWP 40 – Agricultural Activities
- NWP 43 – Stormwater Management Facilities
- NWP 47 – Reserved
- NWP 48 – Existing Commercial Shellfish Aquaculture Activities
- NWP 52 – Water-Based Renewable Energy Generation Pilot Projects

Note: State water quality certification is not required for the following Section 10 only NWPs: 1 – Aids to Navigation, 2 – Structures in Artificial Canals, 9 – Structures in Fleeting and Anchorage Areas, 10 – Mooring Buoys, 11 – Temporary Recreational Structures, 28 – Modifications of Existing Marinas, 35 – Maintenance Dredging of Existing Basins.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that Wisconsin Statutes and administrative rules establish time periods within which requests to review Department decisions must be filed.

To request a contested case hearing pursuant to section 227.42, Wisconsin Statutes, you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources.

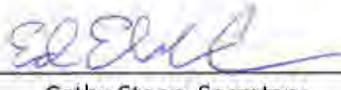
This determination becomes final in accordance with the provisions of s. NR 299.05(7), Wisconsin Administrative Code, and is judicially reviewable when final. For judicial review of a decision pursuant to Sections 227.52 and 227.53, Wisconsin Statutes, you have 30 days after the decision becomes final to file your petition with the appropriate circuit court and to serve the petition on the Secretary of the Department of Natural Resources. The petition must name the Department of Natural Resources as the respondent.

Reasonable accommodation, including the provision of informational material in an alternative format, will be provided for qualified individuals with disabilities upon request.

This notice is provided pursuant to section 227.48(2), Wisconsin Statutes.

Dated at Madison, Wisconsin June 1, 2017

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

By 
Cathy Stepp, Secretary

Wisconsin Point Landfill Modification Approval



March 23, 2020

FID # 816041710
Douglas County
SW/Approval

Ms. Darienne McNamara, Environmental Regulatory Manager
City of Superior – Wisconsin Point Landfill
1316 North 14th Street #200
Superior, WI 54880

Subject: Conditional Closure Plan Approval Modification for the closed Wisconsin Point Landfill, License #12

Dear Ms. McNamara:

The Department of Natural Resources (department) has reviewed and approves the requested modification to the closure plan for the closed Wisconsin Point Landfill, License #12. The closure plan modification included the placement of dredge sediment material on top of the final cover to address settlement and proposed light recreational use as the final use of the landfill. Please include the attached approval in the written operating record for the landfill as specified in s. NR 506.17, Wis. Adm. Code.

Please keep in mind that this approval does not relieve you of obligations to meet all other applicable federal, state and local permits, as well as zoning and regulatory requirements.

If you have questions regarding this approval, please contact Sonny Zentner at (715) 839-3728 or Sonny.Zentner@Wisconsin.gov.

Sincerely,

John Morris, Professional Soil Scientist
Waste and Materials Management Program Supervisor
Northern and West Central Regions

Attachments

cc: Joe Graham - WDNR (email)
Nathan Coller - WDNR (email)
Megan Ballweg - WDNR (email)
John Morris - WDNR (email)
Valerie Joosten - WDNR (email)
Diana Mally - EPA GLNPO (Mally.Diana@epa.gov)
Stephen Rumple - USACE (Stephen.T.Rumple@usace.army.mil)

**BEFORE THE
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES**

**CONDITIONAL CLOSURE PLAN APPROVAL MODIFICATION FOR
THE WISCONSIN POINT LANDFILL (LICENSE # 12)**

FINDINGS OF FACT

The Department of Natural Resources (department) finds that:

1. The City of Superior owns and operated a closed solid waste disposal facility (Wisconsin Point Landfill, License #12) located in the SW ¼ of the NW ¼ of Section 35, Township 49 North, Range 13 West, City of Superior, Douglas County, Wisconsin.
2. A conditional closure plan approval modification was issued by the department for the facility on September 1, 1977. This facility does not have a plan of operation approved under s. 289.30, Wis. Stats., and as such is considered a non-approved facility under s. 289.30, Wis. Stats.
3. On November 22, 2019, the department received a request for a closure plan modification to place dredge sediment material from the Howards Bay Remediation Project on the final cover of the closed Wisconsin Point Landfill and to use the landfill for light recreational use. The review fee has been waived by the department to reduce the cost of the project shared between the US Environmental Protection Agency, Fraser Shipyard, Inc., City of Superior, and the department.
4. The information submitted in connection with the modification request includes the following:
 - a. A request entitled “Request for Closure Plan Modification” dated November 22, 2019 and received by the department on November 22, 2019.
 - b. An email and one attachment dated February 7, 2020, from the City of Superior, containing additional information regarding the closure plan modification request that the department requested in an email dated November 25, 2019.
 - c. An electronic mail (email) dated January 24, 2020, from the City of Superior, containing additional information regarding the closure plan modification request that the department requested in emails dated January 14, 2020 and January 21, 2020.
 - d. An email and one attachment dated January 27, 2020, from the City of Superior, containing additional information regarding the closure plan modification request.
 - e. Two emails and two attachments dated March 5, 2020 and March 10, 2020, respectively, from the City of Superior, containing additional information regarding the closure plan modification request that the department requested in an email dated February 28, 2020.
5. Additional documents considered in connection with the modification request include the following:

- a. The department's September 27, 2016 memorandum entitled "Site-Specific Residual Contamination Levels (RCLs) for Dredged Material from Howards Bay Proposed for Placement at the Closed Wisconsin Point Landfill in Superior, Wisconsin."
 - b. The department's April 19, 2017 memorandum entitled "Revisions to September 27, 2016 Memorandum with Subject Line, "Site-Specific Residual Contamination Levels for Dredge Material Proposed for Placement at the Closed Wisconsin Point Landfill in Superior, Wisconsin."
 - c. Two comments received from the public on March 2, 2020 in an email.
 - d. One comment received from the public on March 4, 2020 in an email.
 - e. Reporters from two local television stations attended the public meeting that was held on March 3, 2020. No other members of the public attended.
 - f. The department's files pertaining to the Wisconsin Point Landfill (License #12).
6. Additional facts considered in review of the proposal include:
- a. Low level contaminated dredge material from the Howards Bay Remediation Project will be placed on the Wisconsin Point Landfill to improve the slope, provide better stormwater drainage, reduce stormwater infiltration, and provide more separation between the waste and the final surface. Dredge material that will be placed on the final cover will need to meet specific placement criteria concentrations. Dredge material that is not allowed to be placed on the final cover will be sent to Vonco Landfill in Duluth, MN (MPCA Permit #SW-536) for disposal. The dredge material is contaminated with lead, polycyclic aromatic hydrocarbons (PAH), mercury, and tributyltin compounds. The more contaminated dredge material will be placed directly above the existing waste and covered with 1.5 feet of less contaminated material. The less contaminated material will be covered with six inches of material from Erie Pier and six inches of topsoil. The topsoil will be seeded with a native plant mix. Upon completion of the project, the Wisconsin Point Landfill will be opened to the public for light recreational activities such as hiking, bird-watching, walking dogs, etc.
 - b. The City of Superior made repairs to the landfill cap in 2012 to cover exposed waste.
 - c. A public meeting was held on March 3, 2020 at the Douglas County Courthouse, at 1313 Belknap Street, Superior, WI, Room 207C regarding placement of the dredge materials on the Wisconsin Point Landfill to comply with s. 289.54, Wis. Stats. No comments were received during the meeting. However, comments were received on March 2 and 4, 2020 via email.
7. The proposed modification will not inhibit compliance with the standards set forth in the applicable portions of chs. NR 500-538, Wis. Adm. Code.

CONCLUSIONS OF LAW

1. The department has authority under s. NR 514.08, Wis. Adm. Code, to modify a closure plan approval if the modification would not inhibit compliance with the applicable portions of chs. NR 500-538, Wis. Adm. Code.

2. The department has authority to approve a closure plan approval modification with special conditions if the conditions are needed to ensure compliance with the applicable portions of chs. NR 500-538, Wis. Adm. Code.
3. In accordance with the foregoing, the department has the authority to issue the following closure plan modification approval.

CONDITIONAL CLOSURE PLAN APPROVAL MODIFICATION

The department hereby approves the proposed closure plan modification for the Wisconsin Point Landfill, subject to compliance with chs. NR 500-538, Wis. Adm. Code, and the following conditions:

1. This approval does not exempt the property owner and the waste generator from any responsibility or liability for any injuries to individuals; or any responsibility under ch. 292, Wis. Stats, chs NR 700-754, Wis. Adm. Code, or ch. NR 140, Wis. Adm. Code to take all corrective actions that the department determines would be needed to restore the environment and protections to human health and the environment if it is discovered that the contaminated dredged material has caused environmental pollution as defined in s. 291.01 (4), Wis. Stats.
2. A final construction documentation report in accordance with ch. NR 516, Wis. Adm. Code shall be prepared and submitted to the department within 60 days of site stabilization, unless the department concurs with an alternative timeframe in writing.
3. The cover soils and vegetation shall be maintained and repaired as necessary to prevent erosion and ponding of water on the cover.
4. The City of Superior shall notify the department's assigned staff a minimum of one week prior to beginning each of the construction events listed below for the purpose of allowing the department to inspect the work.
 - a. Stripping of topsoil and storm water controls
 - b. Placement of the surface layer of dredge soils
 - c. Placement of the subsurface layer of dredge soils
 - d. Placement of dredge material from the Erie Pier Processing & Reuse Facility
 - e. Placement of topsoil and seeding
5. Dredge material placed at the Wisconsin Point Landfill shall be limited to the dredge material acceptance criteria:
 - a. Dredge material that has an average concentration of less than or equal to the placement criteria concentration in Table 2 may be used in the surface layer.
 - b. Dredge material that has an average concentration of less than or equal to five times the placement criteria concentration in Table 2 may be used in the subsurface layer. Efforts shall be made, to the maximum extent practicable, to place materials from dredge management units with the highest concentrations first, and then place material from dredge units with lesser concentrations in successive lifts on top of the first lift.
6. Dredge material that has an average concentration greater than five times the placement criteria concentration in Table 2 shall not be placed at the Wisconsin Point Landfill.

This approval is based on the information available to the department as of the date of the approval. If additional information, project changes or other circumstances indicate a possible need to modify this approval, the department may ask you to provide further information relating to this activity. Likewise, the department accepts proposals to modify approvals, as provided for in state statutes and administrative codes.

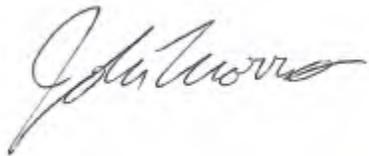
NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision made by the department, you should know that Wisconsin statutes and administrative codes establish time periods and requirements for reviewing department decisions.

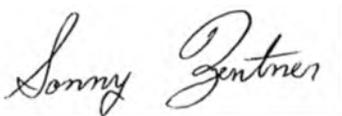
To seek judicial review of the department's decision, sections 227.52 and 227.53, Stats., establish criteria for filing a petition for judicial review. You have 30 days after the decision is mailed or otherwise served by the department to file your petition with the appropriate circuit court and serve the petition on the department. The petition shall name the Department of Natural Resources as the respondent.

Dated: March 23, 2020

DEPARTMENT OF NATURAL RESOURCES
For the Secretary



John Morris, Professional Soil Scientist
Waste and Materials Management Program Supervisor
Northern and West Central Regions



Sonny Zentner, P.E.
Waste Management Engineer
Northern Region

**PROJECT SUMMARY
CLOSURE PLAN MODIFICATION
FOR THE PLACEMENT OF DREDGE MATERIAL AND FINAL USE
FOR THE WISCONSIN POINT LANDFILL**

GENERAL INFORMATION

AUTHORIZED CONTACT: Ms. Darienne McNamara
Environmental Regulatory Manager
City of Superior
1316 North 14th Street #200
Superior, WI 54880
Phone: (715) 395-7506

LICENSEE AND PROPERTY OWNER: City of Superior

SITE LOCATION: The closed Wisconsin Point Landfill, License #12 is located in the SW ¼ of the NW ¼ of Section 35, Township 49 North, Range 13 West, City of Superior, Douglas County, Wisconsin.

ACREAGE AND ACCESS: The size and access to the site will not change as a result of this closure plan modification.

LIMITS OF WASTE BOUNDARY: The limits of waste of the landfill will not change as a result of this closure plan modification. The area of the limits of waste is approximately 23.1 acres.

SITE CHARACTERISTICS

The Wisconsin Point Landfill is a closed landfill. The landfill operated from 1950 to 1976. The landfill was closed in 1977.

PROJECT DETAILS

SCOPE: The project includes the placement of dredge material from the Howards Bay Remediation Project on the final cover of the Wisconsin Point Landfill to provide a disposal location for the dredge material that meets specific placement criteria, restore consistent slopes across the landfill, improve drainage which will decrease infiltration and leachate generation, and make the final cover of the landfill available to the public for light recreational use. Howards Bay is located in the St. Louis River harbor along the shoreline of Lake Superior in Superior, WI.

Approximately 81,200 cubic yards of sediment will be dredged from approximately 16 acres of Howards Bay. An estimated 86,750 cubic yards of the dredged material will be placed at the closed landfill. This volume is different than the volume anticipated to be removed from the bay due to bulking during material handling and dewatering and the segregation of material exceeding the acceptance criteria. After placement at the landfill, the dredged material from Howards Bay will be covered with approximately 15,333 cubic yards of previously dredged material processed at the Erie Pier Processing & Reuse Facility and approximately 15,333 cubic yards of topsoil. The total volume of all material to be placed that includes dredge material from Howards Bay, dredge material from the Erie Pier Processing & Reuse Facility, and topsoil is expected to be less than 120,000 cubic yards. The final volume of material is dependent on the conditions encountered during construction and any additional dredge passes that are needed to ensure that all the contaminated sediment is collected based on confirmation sampling results.

The dredge material will be placed on the final cover of the landfill in four distinct layers from bottom to top:

- Subsurface layer (more contaminated material, thickness varies),
- 1.5-foot surface layer (less contaminated material),
- 6-inches of dredged material from the Erie Pier Processing & Reuse Facility, and
- 6-inches of topsoil.

The depth of the subsurface layer will vary but it will be limited by a maximum slope of 10 percent.

DREDGE MATERIAL ACCEPTANCE CRITERIA AT WISCONSIN POINT LANDFILL: Below are the acceptance criteria to determine whether the dredge material from Howards Bay will be placed at the Wisconsin Point Landfill or sent off site for disposal:

- Dredge material that has an average concentration of less than or equal to the placement criteria concentration in Table 2 (see below) may be used in the surface layer (thickness of 1.5 feet).
- Dredge material that has an average concentration of less than or equal to five times the placement criteria concentration in Table 2 may be used in the subsurface layer. Efforts will be made, to the maximum extent practicable, to place materials from dredge management units with the highest concentrations first, and then place material from dredge units with lesser concentrations in successive lifts on top of the first lift.
- Dredge material that has an average concentration greater than five times the placement criteria concentration in Table 2 will not be placed at the Wisconsin Point Landfill and will be sent to the Vonco Landfill at 1100 West Gary Street, Duluth, MN (MPCA Permit #SW-536) for disposal.

The acceptance criteria for placement at the landfill were developed based on the site-specific acceptance direct contact residual contamination levels (RCLs) calculated under ch. NR 720, Wis. Adm. Code. The site-specific direct contact RCLs were developed based on public feedback, EPA’s updated toxicity values for some chemicals (e.g. benzo[a]pyrene), Wisconsin Department of Public Health Service’s recommendation to use the default exposure values on the U.S. EPA Regional Screening Level (RSL) website instead of ch. NR 720, Wis. Adm. Code default values when calculating RCLs, procedures in s. NR 720.12, Wis. Adm. Code, the department’s technical guide PUB-RR-890 (January 2014), the department’s publication titled RR Program’s RCL Spreadsheet Update March 2017 (DNR-RR-052e), U.S. EPA’s RSL web calculator for a recreational scenario (accessed April 17, 2017 at http://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search), and the exposure factor inputs identified below:

Table 1: Recreational Exposure Scenario for Wisconsin Point Landfill – Exposure Factor Inputs

Age Segment (yr)	Adherence Factor (AF) (mg/cm ²)	Body Weight (BW) (kg)	Exposure Duration (ED) (yr)	Exposure Frequency* (EF) (day/yr)	Exposure Time* (ET) (hr/event)	Intake Rate (IRS) (mg/day)	Skin Surface Area (SA) (cm ² /day)
0 - 2	0.2	15	2	90	4	200	2,373
2 - 6	0.2	15	4	90	4	200	2,373
6 - 16	0.07	80	10	90	4	100	6,032
16 - 30	0.07	80	10	90	4	100	6,032

Notes: Default values from EPA Calculator, for recreational exposures, except values for Exposure Frequency and Exposure Time which are explained below. Additional input assumptions include a vegetative cover fraction of 0.9, exposure area of 23.1 acres, and climatic conditions for Minneapolis, MN.

The contaminants in the dredge material include lead, mercury, polycyclic aromatic hydrocarbons (PAHs), and tributyltin compounds (an antifouling agent used in maritime paints).

Table 2: Recommended Wisconsin Point Landfill Placement Criteria Concentrations in Milligrams per Kilogram (mg/kg) (from the memorandum from Joe Graham (WDNR) to Chris Saari (WDNR) and John Morris (WDNR) dated April 19, 2017)

Chemical	CAS Number	EPA Calculator Site-Specific Screening Level (Residual Contamination Levels (RCLs)) (90 days – 4hrs.)	Basis	Dataset Max	Criteria Basis	Placement Criteria	Surface Layer (avg. concentration ≤ placement criteria)	Subsurface Layer (avg. concentration ≤ 5 times placement criteria)	Vonco Landfill (avg. concentration > 5 times placement criteria)
Lead and Compounds	7439-92-1	400	nc	2700	NI DC	400	≤ 400	≤ 2,000	> 2,000
Mercury (elemental)	7439-97-6	3.13	Ssat	9	NI DC	3.13	≤ 3.13	≤ 15.7	> 15.7
Acenaphthene	83-32-9	13900	nc	1.9	NI DC	3,590	≤ 3,590	≤ 17,950	> 17,950
Acenaphthylene	208-96-8	--	--	0.36	--	--	--	--	--
Anthracene	120-12-7	69700	nc	3.3	NI DC	17,900	≤ 17,900	≤ 89,500	> 89,500
Benz[a]anthracene	56-55-3	4.44	ca	6.3	Site-Specific	4.44	≤ 4.44	≤ 22.2	> 22.2
Benzo(j)fluoranthene	205-82-3	1.65	ca		Site-Specific	1.65	≤ 1.65	≤ 8.25	> 8.25
Benzo[a]pyrene	50-32-8	0.447	ca	5.3	Site-Specific	0.447	≤ 0.447	≤ 2.24	> 2.24
Benzo[b]fluoranthene	205-99-2	4.47	ca	7.8	Site-Specific	4.47	≤ 4.47	≤ 22.4	> 22.4
Benzo[g,h,i]perylene	191-24-2	--	--	2.7	--	--	--	--	--
Benzo[k]fluoranthene	207-08-9	44.7	ca	2.8	NI DC	11.5	≤ 11.5	≤ 57.5	> 57.5
Chrysene	218-01-9	447	ca	6.7	NI DC	115	≤ 115	≤ 575	> 575
Dibenz[a,h]anthracene	53-70-3	0.447	ca	0.64	Site-Specific	0.447	≤ 0.447	≤ 2.24	> 2.24
Fluoranthene	206-44-0	9300	nc	9.1	NI DC	2,390	≤ 2,390	≤ 11,950	> 11,950
Fluorene	86-73-7	9300	nc	2	NI DC	2,390	≤ 2,390	≤ 11,950	> 11,950
Indeno[1,2,3-cd]pyrene	193-39-5	4.47	ca	2.5	Site-Specific	4.47	≤ 4.47	≤ 22.4	> 22.4
Methylnaphthalene, 1-	90-12-0	68.3	ca	0.42	NI DC	17.6	≤ 17.6	≤ 88.0	> 88.0
Methylnaphthalene, 2-	91-57-6	930	nc	1.2	NI DC	239	≤ 239	≤ 1,195	> 1,195
Naphthalene	91-20-3	47.6	ca*	4.3	NI DC	5.52	≤ 5.52	≤ 27.6	> 27.6
Perylene	198-55-0	--	--	0.66	--	--	--	--	--
Phenanthrene	85-01-8	--	--	9.8	--	--	--	--	--
Pyrene	129-00-0	6970	nc	9	NI DC	1,790	≤ 1,790	≤ 8,950	> 8,950
Thallium (Soluble Salts)	7440-28-0	3.04	nc	5.9	Site-Specific	3.04	≤ 3.04	≤ 15.2	> 15.2

Chemical	CAS Number	EPA Calculator Site-Specific Screening Level (Residual Contamination Levels (RCLs)) (90 days – 4hrs.)	Basis	Dataset Max	Criteria Basis	Placement Criteria	Surface Layer (avg. concentration ≤ placement criteria)	Subsurface Layer (avg. concentration ≤ 5 times placement criteria)	Vonco Landfill (avg. concentration > 5 times placement criteria)
Tributyltin Compounds	NA	73.7	nc	13	Site-Specific	73.7	≤ 73.7	≤ 369	> 369

All values in milligrams per kilogram (mg/kg)

-- = Value not available

Dataset Max = maximum value of that compound contained in comprehensive project sampling database

Abbreviations for *Basis* as follows: non-carcinogen (nc), carcinogen (ca), soil saturation level (Ssat), ceiling level (max)

NI DC = non-industrial direct contact RCL from DNR web calculator spreadsheet (350 days – 24 hrs.)

IND DC = industrial direct contact from DNR web calculator spreadsheet (250 days – 8 hrs.)

DEWATERING DREDGE MATERIAL: The dredge material will be dewatered at the staging area at Fraser Shipyards prior to transport. The specifications require a minimum of 24 hours of gravity dewatering and if necessary, the addition of Portland cement as a solidification agent to ensure all material passes the Paint Filter Test as defined in s. NR 500.03(164), Wis. Adm. Code prior to transport.

DREDGE MATERIAL TRANSPORT: Once the dredge material has been dewatered, it will be transported to either the Wisconsin Point Landfill or Vonco Landfill by truck.

DREDGE MATERIAL SETBACK: The placement of the dredge material will be set back 100-feet from the property boundary of the landfill which exceeds the minimum 75-foot setback requirement.

DREDGE MATERIAL FROM THE ERIE PIER PROCESSING & REUSE FACILITY

Erie Pier Processing & Reuse Facility is a dredge material processing facility that hydraulically sorts, dewateres, and stockpiles dredge material. The material that will be used at the Wisconsin Point Landfill is finer material from dredge processing at the Erie Pier Processing & Reuse Facility that has limited uses due to the size of the material. The processed dredge material is being used as cover material at the Wisconsin Point Landfill to increase the separation between the surface and the dredge material from Howards Bay. The processed dredge material can be used as cover material because the material meets the site-specific placement criteria concentration in Table 2 (above) for the Wisconsin Point Landfill.

WISCONSIN POINT LANDFILL SURFACE PREPARATION

Prior to placement of the dredge material at the Wisconsin Point Landfill, the surface will be cleared, grubbed, and proof rolled. Approximately 23.1 acres of the final cover will be disturbed. The construction specifications outlined by the US Army Corps of Engineers for the placement of the dredge material on the Wisconsin Point Landfill will require that the contractor placing the dredge material specify in the erosion control plan how the surface will be prepared, if the existing topsoil will be removed, stockpiled, reused, or left in place, describe how the disturbed area will be minimized, and describe the erosion control practices that will be used. The erosion control plan will be included with the stormwater permit.

LEACHATE HEAD WELLS AND LANDFILL GAS VENTS

Leachate head wells LHW-1R (DNR point #704) and LHW-3 (#703) will need to be extended. Affected wells will be resurveyed to determine top of casing elevation in mean sea level (MSL) following construction. Two landfill gas vents will also need to be extended. The leachate head wells are constructed with PVC and will be extended by cutting the pipe and attaching a pipe extension with couplings and adhesive.

STORMWATER AND EROSION CONTROL

Construction and placement of the dredge material will be required to meet the stormwater permit requirements which includes an erosion control plan approved by the Wisconsin DNR. The stormwater permit application has been submitted. However, the erosion control plan has not been submitted because the Army Corps of Engineers is requiring the contractor who is awarded the project to develop the erosion control plan prior to construction.

The placement of the dredge material will be set back 100 feet from the property boundary of the landfill. A stormwater diversion swale will be constructed on the south slope of the landfill to divert runoff away from the coastal wetland and toward the ditch along Wisconsin Point Road to control stormwater after the dredge material is placed and vegetation has been established. The stormwater diversion swale is not designed to control stormwater during construction and placement of the dredge material.

GROUNDWATER AND SURFACE WATER IMPACTS

By following the dredge material placement criteria, storm water management plans, and construction specifications, the facility does not anticipate an increase in detrimental effects to groundwater or a detrimental effect to surface water from the closed landfill.

VEGETATION OF FINAL COVER OF THE WISCONSIN POINT LANDFILL AFTER PLACEMENT OF DREDGE MATERIAL

Once final grades are achieved, the site will be seeded with a native plant mix at a rate of 0.7 pounds per 1,000 square feet. The native plant mix will include the following:

Common Name	Species	Pounds/Acre
Oats* (see note)	Avena Sativa	37.88
Blue Giant Hyssop	Agastache Foeniculum	0.06
Butterfly Milkweed	Asclepias Tuberosa	0.06
Stiff Sunflower	Helianthus Pauciflorus	0.06
Wild Bergamot	Monarda Fistulosa	0.06
Stiff Goldenrod	Oligoneuron Rigidum	0.06
Large-Flowered Beard Tongue	Penstemon Grandiflorus	0.19
Black-Eyed Susan	Rudbeckia Hirta	0.31
Gray Goldenrod	Solidago Nemoralis	0.04
Heath Aster	Symphyotrichum Ericoides	0.04
Smooth Aster	Symphyotrichum Laeve	0.06
Hoary Vervain	Verbena Stricta	0.19
Bearded Birdfoot Violet	Viola Pedatifida	0.01
Big Bluestem	Andropogon Gerardii	0.70
Kalm's Brome	Bromus Kalmii	2.04
Canada Wild Rye	Elymus Canadensis	1.00
Junegrass	Koeleria Macrantha	0.22
Little Bluestem	Schizachyrium Scoparium	3.27
Indian Grass	Sorghastrum Nutans	0.64
White Prairie Clover	Dalea Candida	0.06
Purple Prairie Clover	Dalea Purpurea	0.27

*Winter wheat may be used as an alternative to oats if germination is needed later in the fall.

Permeant seed mix will be applied at a rate of on 47.2 pounds of Pure Live Seed (PLS) per acre. Seed germination shall meet the requirements in ch. ATCP 20, Wis. Adm. Code.

After the seed mix is applied, maintenance of the final cover will need to meet the Unified Facilities Guide Specifications and requirements specified in the erosion control plan by the contractor. The newly seeded areas will need to be protected and maintained until an acceptable stand of vegetation is developed. The contractor will be required to repair any areas of erosion and reseed as necessary until complete coverage and satisfactory stand of vegetation is achieved for a period of at least one growing season. The vegetation on the final cover will be mowed annually.

If seeding cannot occur until the following growing season, a temporary seed mix will be applied using one of the following:

Species	Pounds/Acre	Percent Purity	Seeding Season
Annual Ryegrass	80	97	Fall

Species	Pounds/Acre	Percent Purity	Seeding Season
Cereal Rye	131	97	Fall
Winter Wheat	131	95	Fall
Oats	131	98	Spring and Summer

Fertilizer and soil conditioner requirements will be determined based on results of topsoil nutrient testing done during the project. Hay or straw mulch will be applied at a rate of 2 tons per acre and anchored using a packer or similar suitable equipment. It is anticipated that temporary seeding will be done at the end of the construction season followed with permanent seeding the following spring.

FINAL USE OF THE WISCONSIN POINT LANDFILL AFTER PLACEMENT OF DREDGE MATERIAL

Following construction and revegetation, the site will be open to the public for light recreational uses such as hiking, bird-watching, walking dogs, etc. Prior to this approval, the Wisconsin Point Landfill was not open to the public. The Parks, Recreation, and Forestry Department of the City of Superior will create mowed pathways through the vegetation and install four benches on the landfill surface. No material from the final cover will be excavated for the trails or benches. Wood chips or gravel may be used as a base for the trail. However, any base material, if used, would be placed on top of the surface. No soil will be removed for placement of the base material. The benches will be free standing and will not penetrate the final cover of the landfill.

PROJECT DURATION

The project is estimated to take one full construction season for dredging and placement.

Chapter 30 Permit IP-04003



January 24, 2020

IP-NO-2019-16-04003

IP-NO-2019-16-04350

United States Environmental Protection Agency
Great Lakes National Program Office
c/o William Murray & Diana Mally
77 West Jackson Blvd. G-9J
Chicago, IL60604-3590

Dear Mr. Murray and Ms. Mally:

The Department of Natural Resources has completed its review of your application for a permit to remove materials from the bed and place miscellaneous structures on the bed of the St Louis River, in the City of Superior, Douglas County. You will be pleased to know your application is approved.

I am attaching a copy of your permit, which lists the many important conditions that must be followed to protect water quality and habitat. A copy of the permit must be posted for reference at the project site. Please read your permit conditions carefully so that you are fully aware of what is expected of you.

Please also be aware that the approved application and plans were issued for the permit process and not for construction. Prior to beginning construction, final plan sets issued for construction certified in accordance with ch. NR 712, Wis. Adm. Code (i.e., certification statement, P.E. stamp, signed and dated) shall be submitted to the Department for written approval.

Joe Graham is the Department's designated project manager (DNR PM) for this contaminated sediment remediation project. All submittals requiring DNR PM approval under the permit shall be submitted to Mr. Graham electronically at Joseph.Graham@Wisconsin.gov or by delivery to 810 W. Maple St., Spooner, WI 54801, with a courtesy copy to me. You shall notify me of the of the date you plan to start work and when the project is complete

Please note you are required to submit photographs of the completed project within 7 days after you've finished construction. This helps both of us to document the completion of the project and compliance with the permit conditions.

If you have any questions about your permit, please call me at (715) 392-0803 or email Steven.LaValley@wisconsin.gov.

Sincerely,



Steven LaValley
Water Management Specialist

cc: Bill Sande - Project Manager, U.S. Army Corps of Engineers
Douglas County Zoning Administrator
Steve Rumble – USACE PM, Stephen.T.Rumble@usace.army.mil Eric
Dievendorf – Consulting Engineer, eric.dievendorf@arcadis.com
Joseph Graham – DNR PM, joseph.graham@wisconsin.gov
Sean Smith – Fraser Shipyards PM, ssmith@noengwks.com
Darienne McNamara – City of Superior PM, mcnamarad@ci.superior.wi.us

The United State Environmental Protection Agency (EPA) is hereby granted under Section 30.20(2) and Section 30.12(3m), Wisconsin Statutes, a permit to remove materials from the bed of the St. Louis River and to place structures on the bed of the river within Howards Bay, in the City of Superior, Douglas County, generally described as being in the E ½ of the SE ¼ of Section 10, the SW ¼ of the SE ¼ and the SW ¼ of Section 11, and the NW ¼ of the NE ¼ of Section 14, Township 49 North, Range 14 West, subject to the following conditions:

PERMIT

1. You must notify Steven LaValley at phone (715) 392-0803 or email Steven.LaValley@wisconsin.gov before starting construction and again not more than 5 days after the project is complete.
2. You must complete the project as described on or before December 31, 2021. If you will not complete the project by this date, you must submit a written request for an extension prior to expiration of the initial time limit specified in the permit. Your request must identify the requested extension date. The Department shall extend the time limit for an individual permit or contract for no longer than an additional 5 years if you request the extension before the initial time limit expires. You may not begin or continue construction after the original permit expiration date unless the Department extends the permit in writing or grants a new permit.
3. This permit does not authorize any work other than what you specifically describe in your application and plans provided for the permit process prepared by Arcadis U.S., Inc., under contract to the United States Army Corps of Engineers (USACE), and as modified by the conditions of this permit. If you wish to alter the project or permit conditions, you must first obtain written approval of the Department. Prior to beginning construction, final plan sets issued for construction that are certified in accordance with ch. NR 712, Wis. Adm. Code (i.e., certification statement, P.E. stamp, signed and dated) shall be submitted to the Department for approval.
4. Before you start your project, you must first obtain any permit or approval that may be required for your project by local zoning ordinances and by the U.S. Army Corps of Engineers. You are responsible for contacting these local and federal authorities to determine if they require permits or approvals for your project. These local and federal authorities are responsible for determining if your project complies with their requirements.

5. A pre-construction meeting will be held in which the applicants, riparian owners, consultants, contractors, subcontractors, resident/project engineers, City of Superior, Fraser Shipyards, Inc., USACE, and the Department are invited to attend. You shall notify the Department a minimum of 10 working days prior to the date of the meeting.
6. Upon reasonable notice, you shall allow access to your project site during reasonable hours to any Department employee who is investigating the project's construction, operation, maintenance or permit compliance.
7. The Department may modify or revoke this permit for good cause, including if the project is not completed according to the terms of the permit or if the Department determines the activity is detrimental to the public interest.
8. You must post a copy of this permit at a conspicuous location on the project site, visible from the waterway, for at least five days prior to construction, and remaining at least five days after construction. You must also have a copy of the permit and approved plan available at the project site at all times until the project is complete.
9. Your acceptance of this permit and efforts to begin work on this project signify that you have read, understood and agreed to follow all conditions of this permit.
10. You shall supply a copy of this permit to all parties associated with the project, including, but not limited to, contractors, subcontractors, and riparian owners in the project area.
11. You must submit a series of photographs to the Department, within one week of completing work on the site. The photographs must be taken from different vantage points and depict all work authorized by this permit.
12. You must submit to the Department bathymetric survey results and a contour map(s) showing the elevations of the bed for the entire project area after work is complete.
13. You, your agent, and any involved contractors or consultants may be considered a party to the violation pursuant to Section 30.292, Wis. Stats., for any violations of Chapter 30, Wisconsin Statutes, or this permit.
14. Permissions by riparian owners must be obtained and submitted to the DNR before the installation of monitoring buoys or placement of sand cover material on the river bed adjacent to their property.

15. Air curtains will be installed, operated, and maintained at the entrances to Fraser Slip, Cummings Slip, and Hughitt Slip to contain turbidity and associated contaminants during construction.
16. The project shall monitor water quality in Howards Bay following the procedures described in the November 9, 2018 Department memorandum with the subject line, *Resuspension Performance Monitoring (i.e. Turbidity Requirements) for Sediment Remediation in Howards Bay, Superior, Wisconsin (November 9, 2018 Memo)*. This memorandum is incorporated into this permit by reference. This project is following a performance-based approach that requires turbidity monitoring at a background location and at specific locations during construction that sets action levels and procedures to be taken when those levels are exceeded. The monitoring approach was developed to minimize the potential spread of contamination during construction in consideration of the conditions present at the site. In order to be protective to the resource and to accomplish the project goals, in consideration of site conditions, the DNR PM may require or approve changes to the monitoring and response procedures described in the November 9, 2018 memo. Requests for changes must be submitted in writing.
17. Turbidity shall be measured in Nephelometric Turbidity Units (NTU) and shall be recorded and reported as described in the November 9, 2018 memo. The action levels and required actions are detailed in Table 1 of the November 9, 2018 memo and summarized below.
 - a. The Warning Level is 65 NTU. When the Warning Level is exceeded, the project will increase monitoring, inspect & repair BMPs, identify the cause of exceedance, make operational changes, and notify project oversight.
 - b. The Action Level is 87 NTU. When the Action Level is exceeded, the project will increase monitoring, inspect & repair BMPs, make operational changes and continue work only if project oversight concurs.
 - c. The Not to Exceed (NTE) Level is 110 NTU. When the NTE Level is exceeded in-water activities will stop until operational changes are made, levels drop below the NTE level for 30-minutes, DNR PM is notified by email, and oversight concurs.
18. Construction shall be accomplished in such a manner as to minimize erosion and siltation into surface waters. Erosion control measures (such as silt fence and straw bales) must meet or exceed the technical standards of ch. NR 151, Wis. Adm. Code. The technical standards are found at:
http://dnr.wi.gov/topic/stormwater/standards/const_standards.html .

19. As a remedial action to address contaminated sediment the project shall use the procedures, equipment, and contractors appropriate for the work to safely achieve remedial goals in a manner that is protective of human health and the environment.
20. The project shall use sound environmental practices, including environmental controls to prevent and to control releases of fuel, hydraulic fluids, and waste during dredging activities, including but not limited to:
 - a. Providing on-site plans and equipment to contain and absorb potential fuel/hydraulic fluid spills such as containment and absorption booms.
 - b. Providing on-site plans and equipment to contain and absorb sheen outside the dredging containment system.
 - c. Providing on-site plans and equipment to contain any release of dredged material or interstitial/carriage water to areas beyond project limits.
21. Material must be dredged by equipment which is designed to minimize the amount of sediment that is released into the water. Washing of equipment, scows, or debris during or following removal from the bed into the water and overflowing or pumping water from scows into the water are prohibited. Equipment must be properly sized so that excavation conforms to the plans.
22. A confirmation sampling plan must be submitted to the DNR PM for written approval. The sampling plan needs to include details on sampling locations, collection methods, segmentation of sample intervals, sampling parameters, laboratory methods and detection levels, and all other information relevant to sample collection and analysis. Confirmation samples must be collected and analyzed according to the approved plan. A laboratory certified under ch. NR 149 Wis. Adm. Code must be used for chemical analyses. All results, including lab analytical reports, field data, and core logs shall be submitted to the DNR PM.
23. This permit authorizes the placement of clean sand on the bed for management of post-dredge residual contamination. Prior to placement of the sand the project shall provide to the results of post-dredge sediment sampling results, post-dredge bathymetry, and other data necessary to demonstrate compliance with the project remedial goals. The project must receive written arrival from the DNR PM prior to placement of sand.

24. The sand used as a sediment cover for post-dredge residual contamination and enhanced natural recovery must be of a specific quality to ensure the protection of natural resources during construction and long-term, or otherwise be clean. The Department established specific testing and quality needs for sand used on this project in a March 27, 2017 memorandum with the subject line, *Recommendations for the Sand to be used for Residual Cover and Enhanced Natural Recovery in Howards Bay, Superior, Wisconsin*. In summary, a sample shall be analyzed for every 1,000 cubic yards from a commercial quarry or one sample from every 500 yards from noncommercial sources. The level of metals and total polycyclic aromatic hydrocarbons must be below threshold effects concentrations for benthic invertebrates. The gradation needs to have a fines content of 1% or less passing the #200 sieve for residual cover, and 3.5% or less pass the #200 sieve for enhanced natural recovery.
25. The following contractor submittals identified in the project specifications will be submitted to the DNR PM for review: Environmental Protection Plan, Confirmation Sampling Plan, Sampling & Analysis Plan, On-Site Material Handling Plan, Waste Transportation and Disposal Plan, Work Sequence Schedule, Erosion Control Plan, Dust & Dust Control Plan, Environmental Dredging Plan, Cover Placement Plan, and Cover Placement Safety Plan, Erosion Control and Stormwater Management Compliance Notebook, Stormwater Notice of Termination, Waste Determination Documentation, Disposal Documentation for Hazardous and Regulated Waste, Solid Waste Management Report, As-Built Drawings, Record Drawings, Post-Removal Sampling Test Reports, Closure Report, Waste Test Reports, Certificates of Disposal, Wisconsin Point Landfill Placement Plan, Maintenance Instructions, Turbidity Monitoring Systems, and Daily Report of Environmental Dredging Operations.
26. Operation of vehicles on the bed must be approved by the Department.
27. All material handling and disposal must follow established protocols for the levels of contamination.
28. All material hauling trucks leaving the site must be covered to prevent contaminants from spilling from trucks along the designated disposal route to the disposal facilities. Trucks used to haul contaminated material off-site must be in good working condition, sealed, and the tires cleaned through an onsite tire wash as necessary, to prevent the spread of contaminants to public roads. Public roads must be kept clean and free of contaminated material.
29. All temporary structures must be removed from the project site upon completion of construction activities.

30. All equipment used for the project including but not limited to tracked vehicles, barges, boats, hoses, sheet pile and pumps shall be de-contaminated for invasive and exotic viruses and species prior to use and after use.

The following steps must be taken every time you move your equipment to avoid transporting invasive and exotic viruses and species. To the extent practicable, equipment and gear used on infested waters shall not be used on other non-infested waters.

1. **Inspect and remove** aquatic plants, animals, and mud from your equipment.
2. **Drain all water** from your equipment that comes in contact with infested waters, including but not limited to tracked vehicles, barges, boats, hoses, sheet pile and pumps.
3. **Dispose** of aquatic plants, animals in the trash. Never release or transfer aquatic plants, animals or water from one waterbody to another.
4. **Wash your equipment** with hot (>140° F) and/or high-pressure water,

- OR -

Allow your equipment to **dry thoroughly for 5 days.**

FINDINGS OF FACT

1. The United State Environmental Protection Agency (EPA) filed an application for a permit to remove material from the bed of and to place structures on the bed of the St. Louis River to effectuate construction the Howards Bay Great Lakes Legacy Act (GLLA) project, generally the area is described as being in the E ½ of the SE ¼ of Section 10, the SW ¼ of the SE ¼ and the SW ¼ of Section 11, and the NW ¼ of the NE ¼ of Section 14, Township 49 North, Range 14 West, in the City of Superior, Douglas County,
2. Howards Bay is part of the St. Louis River and includes Hughitt Avenue Slip, Cummings Avenue Slip, and Fraser Slip.
3. In 1987 the St. Louis River was listed as one of 43 Area of Concerns (AOC) due to impairments of beneficial uses due to contamination and habitat degradation. The remedial action plan for the St Louis River AOC identifies the remediation of contaminated sediments in Howards Bay as a management action that needs to be completed to address beneficial use impairments and ultimately delist the AOC.
4. Howards Bay is listed as a site with reported sediment contamination in the Department's Bureau for Remediation and Redevelopment Tracking System (BRRTS) under BRRTS Case # 02-16-563449. Remediation of contaminated sediments is necessary to repair the environment and improve water quality at this site.

5. On May 02, 2019, the EPA executed a partnership agreement with Fraser Shipyards, the City of Superior, and the Department to cost share remedial action of contaminated sediments in Howards Bay under the GLLA. The USACE is providing design and construction services under an interagency agreement with EPA. Arcadis U.S., Inc. is the design contractor for USACE. USACE will also hire and oversee a construction contractor to complete the project.
6. The project will consist of over dredging areas of contaminated sediment by a foot and then placing a minimum of 6 and maximum of 9 inches of sand cover over the area where sediment has been removed. Depending on the level of contamination the sediment will be either hauled to the inactive city of Superior Landfill on Wisconsin Point where it will be used to improve the cover layer of the landfill cap or disposed of at an active commercial landfill where contamination levels exceed criteria for use in the landfill cover material. The dredged material placed at the city landfill will be covered with one foot of topsoil, consisting of six inches of commercially purchased topsoil over six inches of reclaimed soil from Erie Pier. Dredge. There are lightly contaminated areas (enhanced natural recovery) that are too shallow to be reached with a barge to remove the material. These areas will be covered with 6 to 9 inches of clean sand (they will all continue to be submerged).
7. A maximum of 100,000 cubic yards of contaminated sediment will be removed via mechanical dredging using an environmental bucket that is designed and operated to minimize the amount of sediment that escapes into the water.
8. A sediment cover consisting of 6 to 9 inches of sand may be placed on up to 20 acres of the bed for management of residual contamination after dredging. The actual area of sediment cover for dredge residuals is contingent on confirmation sampling results and the decision tree for the project. The project will report the locations and volumes of sediment cover to the DNR PM.
9. Enhanced natural recovery will be performed by placing 6 to 9 inches of sand to establish a sediment cover over approximately 1.1 acres of the bed at the locations shown in the plans.
10. The Department has completed an investigation of the project site and has evaluated the project as described in the application and plans.
11. The St. Louis River is a navigable water and a bulkhead line exists adjacent to the site.
12. The proposed project, if constructed in accordance with this permit will not adversely affect water quality, will not increase water pollution in surface waters and will not cause environmental pollution as defined in s. 283.01(6m), Wis. Stats.

13. The proposed project will not impact wetlands if constructed in accordance with this permit.
14. The Department of Natural Resources has determined that the agency's review of the proposed project constitutes an equivalent analysis action under s. NR 150.20(2), Wis. Adm. Code. The Department has considered the impacts on the human environment, alternatives to the proposed projects and has provided opportunities for public disclosure and comment. The Department has completed all procedural requirements of s. 1.11(2)(c), Wis. Stats., and NR 150, Wis. Adm. Code for this project.
15. The Department of Natural Resources has completed all procedural requirements and the project as permitted will comply with all applicable requirements of sections 30.20(2), 30.12(3m), Wisconsin Statutes and Chapters NR 102, 103, 345, and 724 of the Wisconsin Administrative Code.

The applicant was responsible for fulfilling the procedural requirements for publication of notices under s. 30.208(5)(c)1m., Stats., and was responsible for publication of the notice of pending application under s.30.208(3)(a), Stats. or the notice of public informational hearing under s.30.208(3)(c), Stats., or both. S. 30.208(3)(e), Stats., provides that if no public hearing is held, the Department must issue its decision within 30 days of the 30-day public comment period, and if a public hearing is held, the Department must issue its decision within 20 days after the 10-day period for public comment after the public hearing. S. 30.208(5)(bm), Stats., requires the Department to consider the date on which the department publishes a notice on its web site as the date of notice.

16. The placement of sand cover, as described in the final approved project plans, for management of dredged residuals and enhanced natural recovery meets the definition of a sediment cover in s. 292.01(17m), Stats. Financial assurance and continuing obligations for monitoring and maintenance are not applicable for sand cover at this site.
17. Any monitoring buoys and sand cover areas will not materially obstruct navigation because the area will remain open water. Also, the buoys will be marked and are temporary structures that must be removed at the end of the project.
18. The project will not be detrimental to the public interest. It is being undertaken to remove historic contamination and will improve habitat for fish and wildlife.
19. The placement of sand cover in areas of contamination will not materially reduce the flood flow capacity of a stream because the areas are small and located within back water areas with little or no flow.

20. The Dredging will not cause environmental pollution as defined in s. 299.01(4), is being undertaken to remove contaminated sediment, and will be monitored and managed to prevent the suspension and spread of contamination.

21. Dredging and the enhanced natural recovery will not material injury rights of any riparian owners of real property that abuts any water body that is affected by the activity. If the conditions are followed.

CONCLUSIONS OF LAW

1. The Department has authority under the above indicated Statutes and Administrative Codes, to issue a permit for the construction and maintenance of this project.
2. The Department has complied with s. 1.11, Wis. Stats.

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that the Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions shall be filed. For judicial review of a decision pursuant to sections 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review shall name the Department of Natural Resources as the respondent.

To request a contested case hearing of any individual permit decision pursuant to section 30.209, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources, P.O. Box 7921, Madison, WI, 53707-7921. The petition shall be in writing, shall be dated and signed by the petitioner, and shall include as an attachment a copy of the decision for which administrative review is sought. If you are not the applicant, you must simultaneously provide a copy of the petition to the applicant. If you wish to request a stay of the project, you must provide information, as outlined below, to show that a stay is necessary to prevent significant adverse impacts or irreversible harm to the environment. If you are not the permit applicant, you must provide a copy of the petition to the permit applicant at the same time that you serve the petition on the Department.

The filing of a request for a contested case hearing is not a prerequisite for judicial review and does not extend the 30-day period for filing a petition for judicial review.

A request for contested case hearing must meet the requirements of section 30.209, Wis. Stats., and sections NR 2.03, 2.05, and 310.18, Wis. Admin. Code, and if the petitioner is not the applicant the petition must include the following information:

1. A description of the objection that is sufficiently specific to allow the department to determine which provisions of this section may be violated if the proposed permit or contract is allowed to proceed.
2. A description of the facts supporting the petition that is sufficiently specific to determine how the petitioner believes the project, as proposed, may result in a violation of Chapter 30, Wis. Stats;
3. A commitment by the petitioner to appear at the administrative hearing and present information supporting the petitioner's objection.

If the petition contains a request for a stay of the project, the petition must also include information showing that a stay is necessary to prevent significant adverse impacts or irreversible harm to the environment.

Dated at Superior Service Center, Wisconsin on January 24, 2020.

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES
For the Secretary

By  _____
Steven LaValley
Water Management Specialist

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ERDC/ITL TR-12-1 (2012) CAD Drafting Standard

ERDC/ITL TR-12-6 (2012) A/E/C CAD Standard - Release 5.0

1.2 DEFINITIONS

1.2.1 As-Built Drawings

As-built drawings are developed and maintained by the Contractor and depict actual conditions, including deviations from the Contract Documents. These deviations and additions may result from coordination required by, but not limited to: contract modifications; official responses to Contractor submitted Requests for Information; direction from the Contracting Officer; designs which are the responsibility of the Contractor, and differing site conditions. Maintain the as-builts throughout construction as red-lined hard copies on site.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals; G-AOF

SD-11 Closeout Submittals

As-Built Drawings; G-AOF

Record Drawings; G-AOF

As-Built Record of Equipment and Materials

Final Approved Shop Drawings

1.4 QUALITY CONTROL

Additions and corrections to the contract drawings must be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols must be the same as the original line colors, line weights, lettering, layering conventions, and symbols.

1.5 WARRANTY MANAGEMENT

1.5.1 Performance Bond

The Performance Bond must remain effective throughout the warranty period.

- a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.
- b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.
- c. Following oral or written notification of required construction warranty repair work, respond in a timely manner. Written verification will follow oral instructions. Failure to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.5.2 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty will be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, be continuously available, and be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.5.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. Submit a report on any warranty item that has been repaired during the warranty period. Include within the report the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframe specified, the Government will perform the work and back charge the construction warranty payment item established.

- a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

- b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.
- c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

PART 2 PRODUCTS

2.1 GOVERNMENT FURNISHED MATERIALS

The Government will provide an optical disc (CD or DVD) at the preconstruction conference that contains the following:

- a. One set of "as-designed" electronic CAD files in the specified software and format revised to reflect all amendments and the final contract PDF drawings. The CAD files are provided to enable preparation of as-built or as-constructed drawings. If discrepancies exist between the CAD files and the contract PDF drawings, correct the CAD files to show the contract PDF drawings.

2.2 SYSTEM DESCRIPTION

Prepare the CAD drawing files in MicroStation V8i format compatible with a Windows 7 operating system.

2.2.1 Additional Drawings

If additional drawings are required, prepare them using the specified electronic file format applying the same graphic standards used for original drawings. The title block and drawing border to be used for any new final record drawings must be identical to that used on the contract drawings.

2.2.1.1 Sheet Numbers and File Names

If a sheet needs to be added between two sequential sheets, append a Supplemental Drawing Designator in accordance with ERDC/ITL TR-12-6 Adding a drawing sheet, and ERDC/ITL TR-12-1 Adding or deleting drawing sheets and index sheet procedures.

PART 3 EXECUTION

3.1 AS-BUILT DRAWINGS

3.2 AS-BUILT DRAWINGS CONTENT

Revise As-Built Drawings in accordance with ERDC/ITL TR-12-1 and ERDC/ITL TR-12-6. Provide 2 sets of paper copies from PDF drawings to show the as-built conditions by red-line process during the execution of the project. Keep these working as-built markup drawings current on a weekly basis and at least one set available on the jobsite at all times. Changes from the contract drawings which are made during construction or additional information which

might be uncovered in the course of construction must be accurately and neatly recorded as they occur by means of details and notes. The accuracy of the notations on the contract working drawings and shop drawings will be regularly reviewed by the Government monthly. For failure to maintain the working and final record drawings as specified herein, the Contracting Officer will withhold 10 percent of the monthly progress payment until approval of updated drawings. Shown on the as-built drawings, but no limited to, the following information:

- a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Locate valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.
- b. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.
- c. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to shop drawings.
- d. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.
- e. Changes or Revisions which result from the final inspection.
- f. Where contract drawings or specifications present options, show only the option selected for construction on the working as-built markup drawings.
- g. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, furnish a contour map of the final borrow pit/spoil area elevations.
- h. Modifications (include within change order price the cost to change working as-built markup drawings to reflect modifications).
- i. Unusual or uncharted obstructions that are encountered in the contract work area during construction.
- j. Bathymetry contours showing final environmental dredge elevations.
- k. Final topographic and bathymetry of environmental and residual cover placed and restored staging areas.
- l. Location, extent, thickness, and size of sediment particularly where it will be normally submerged by water.
- m. Shop drawings shall also be maintained with notation of any changes made.

3.3 RECORD DRAWING FILES

If additional drawings are required, prepare them using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final record drawings must be identical to that used on the contract drawings. Accomplish additions and corrections to the contract drawings using CAD files. Provide all program files and hardware necessary to prepare final PDF record drawings. The Contracting Officer will review final PDF record drawings for accuracy and return them to the Contractor for required corrections, changes, additions, and deletions.

3.3.1 Rename the CAD Drawing files

Rename the CAD Drawing files using the contract number as the Project Code field, (e.g., W91238-15-C-10A-102.DGN) as instructed in the Pre-Construction conference. Use only those renamed files for the Marked-up changes. Make all changes on the layer/level as the original item.

- a. For MicroStation files (DGN), enter all as-built delta changes and notations on:
 - Level #63
 - Level/Layer Name contains: ANNO-REVS
 - Level/Layer Description: Revisions
- c. When final revisions have been completed, show the wording "RECORD DRAWING AS-BUILTS" followed by the name of the Contractor in letters at least 3/16 inch high on the cover sheet drawing. Date RECORD DRAWING AS-BUILTS" drawing revisions in the revision block.

3.4 RECORD DRAWINGS

Prepare final record drawings quarterly and upon completion of the construction, the contractor shall submit a hard copy or electronic copy of the red line working drawings for review. Once approved, transfer the changes from the approved working as-built markup drawings to the original electronic CAD drawing files. Modify the as-built CAD drawing files to correctly show the features of the project as-built by bringing the working CAD drawing set into agreement with approved working as-built markup drawings, and adding such additional drawings as may be necessary. Refer to ERDC/ITL TR-12-1 Chapter 11 Drawing Revisions. Jointly review the working as-built markup drawings with printouts from working as-built CAD drawing PDF files for accuracy and completeness. Monthly review of working as-built CAD drawing PDF file printouts must cover all sheets revised since the previous review. These PDF drawing files are part of the permanent records of this project. Any drawings damaged or lost must be satisfactorily replaced at no expense to the Government.

- a. Drawing revisions (include within change order price the cost to change working and final record drawings to reflect revisions) and compliance with the following procedures.
 - (1) Follow directions in the revision for posting descriptive changes.

- (2) The revision delta size must be 5/16 inch unless the area where the delta is to be placed is crowded. Use a smaller size delta for crowded areas.
- (3) Place a revision delta at the location of each deletion.
- (4) For new details or sections which are added to a drawing, place a revision delta by the detail or section title.
- (5) For minor changes, place a revision delta by the area changed on the drawing (each location).
- (6) For major changes to a drawing, place a revision delta by the title of the affected plan, section, or detail at each location.
- (7) For changes to schedules or drawings, place a revision delta either by the schedule heading or by the change in the schedule.

3.4.1 Final Record Drawing Package

Submit the final record PDF and CAD drawings package for the entire project within 20 days of substantial completion of all phases of work. Submit one set of ANSI D size PDF and CAD files on optical disc, read-only memory (ROM), two sets of ANSI D size prints and one set of the approved working record drawings. The package must be complete in all details and identical in form and function to the contract drawing files supplied by the Government.

3.5 FINAL APPROVED SHOP DRAWINGS

Upon completing the work under the contract, the Contractor shall furnish a complete set of all shop drawings as finally approved. These drawings shall show all changes and revisions made up to the time the construction is completed and accepted. Record shop drawings shall be submitted in their native format. If drawings were prepared manually or using software other than MicroStation, an electronic PDF copy shall also be provided. One full-sized hard copy of all shop drawings shall be also be provided. Submit final approved project shop drawings 15 days after transfer of the completed project.

3.6 CONSTRUCTION CONTRACT SPECIFICATIONS

Submit final PDF file record construction contract specifications, including revisions thereto, 15 days after dredging completion.

3.7 AS-BUILT RECORD OF MATERIALS

Furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Submit two sets of final record of equipment and materials 10 days after final inspection. Key the designations to the related area depicted on the contract drawings. List the following data: specification section, suppliers, composition and size, and where used.

3.9 CLEANUP

Howards Bay SND and GLLA Dredging
AS AWARDED

Leave premises "broom clean." Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site.

-- End of Section --

SECTION 02 61 13

EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL
02/10

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

TESTAMERICA LABORATORIES, Inc. (TA)

TA SOP No. BR-GC-008 (Rev. 10) Organotin Concentrations Using Gas Chromatograph/Flame Photometric Detector

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA SW-846 (Update V) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods
EPA Method 160.2 Total Suspended Solids (TSS)(Revision 11/16/1999)

ASTM INTERNATIONAL (ASTM)

ASTM D638 (2014) Standard Test Method for Tensile Properties of Plastics
ASTM D1004 (2013) Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
ASTM D4533/D4533M (2015) Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D4632/D4632M (2015a) Grab Breaking Load and Elongation of Geotextiles
ASTM D4833/D4833M (2007; E 2013; R 2013) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
ASTM D5199 (2012) Standard Test Method for Measuring the Nominal Thickness of Geosynthetics
ASTM D5261 (2010) Standard Test Method for Measuring Mass per Unit Area of Geotextiles
ASTM D7238 (2012) Standard Test Method for Effect of Exposure of Unreinforced Polyolefin Geomembrane Using Fluorescent UV Condensation Apparatus

WISCONSIN DEPARTMENT OF NATURAL RESOURCES (WDNR)

NR 108 (March 2014) Requirements for Plans and Specifications Submittal for Reviewable

Projects and Operations of Community Water
Systems, Sewerage Systems and Industrial
Wastewater Facilities

NR 149 (July 2014) Laboratory Certification and
Registration

NR 700 (September 2018) General Requirements

WISCONSIN DEPARTMENT OF TRANSPORTATION(WisDOT)

WisDOT Standard Specifications (2020 Edition) Standard Specifications For
Highway And Structure Construction

1.2 DESCRIPTION OF CONTAMINATED MATERIAL

Approximate locations of contaminated material are shown on the Drawings. Characterization data on the nature and extent of the contaminated material are shown in the Design Document Report, GLLA Sediment Cleanup in Howards Bay, Superior, Wisconsin (DDR). Submit an Onsite Material Handling Plan as specified below. Notify the Contracting Officer within 24 hours, and before dredging, if contaminated material is discovered that has not been previously identified or if other discrepancies between data provided and actual field conditions are discovered.

1.2.1 Scheduling

Notify the Contracting Officer 14 calendar days prior to the start of environmental dredging of contaminated material. Contractor shall allow for 14 calendar days between end of navigational dredging and start of environmental dredging within each dredge unit. The Contracting Officer will be responsible for contacting regulatory agencies in accordance with the applicable reporting requirements.

1.2.2 Onsite Material Handling Plan

Submit an Onsite Material Handling Plan within 30 calendar days after notice to proceed. No work covered by the Onsite Material Handling Plan, with the exception of site inspections, shall be performed until the Onsite Material Handling Plan is approved. Allow 30 calendar days in the schedule for the Government's review. No adjustment for time or money will be made if resubmittals of the Onsite Material Handling Plan are required due to deficiencies in the plan. At a minimum, the Onsite Material Handling Plan shall include:

- a. Schedule of activities.
- b. Method of environmental dredging and equipment to be used, including material conveyance.
- c. Storage methods and locations for liquid and solid contaminated material, including staging area and material transfer locations.
- d. Contaminated material handling and processing plan, including but not limited to solidification to meet dewatering/stabilization requirements.

e. Liquid Management activities and treatment plan, including details necessary to meet WDNR guidelines for an industrial wastewater pretreatment system engineering report and NR108. At minimum include:

1. Description of the treatment system to be used for treatment of construction water including sizing, materials, volume/flow capacity, and operation procedures.
2. List of all equipment and vessels to be used, including manufacturer names, models, and performance data. The equipment proposed shall consider storage and pumping requirements for handling all construction water generated during work.
3. Figure showing general project location and layout of the treatment system and conveyance system.
4. Shop drawings showing the arrangements, sizes, and capacities, locations, and layout of all equipment and vessels to be used for water pretreatment. The shop drawings shall include process and instrumentation diagrams, sample ports, and electrical power feed one-line diagrams for equipment.
5. Operations and Maintenance (O&M) Manual for the treatment system, including startup/commissioning procedures, system inspection, testing, and maintenance.
6. Sampling and analysis plan to meet the monitoring and testing requirements for discharge.
7. Procedures, materials, and equipment to be used for conveying treated water to discharge manhole, and methods for protecting the discharge point when not attended.
8. Description of procedures, materials, and equipment to be used to prevent cross-contaminating surfaces and materials not impacted.
9. Description of any chemicals (e.g., polymers, coagulants) to be used, including the basis for determining the quantity of chemicals needed. Safety Data Sheets (SDSs) shall be provided for all chemicals proposed for use.
10. Description of any media (e.g. sand, carbon) to be used, including the basis for determining the quantity of media needed, backwashing and process management necessary, anticipated media lifespan, and removal and restocking procedures shall be included. SDSs shall be provided for all media proposed for use.
11. Description of procedures, material, and equipment to be used for handling and disposal of solids removed by the system and used filter/adsorption media in accordance with the Contract Documents.

f. Borrow sources and haul routes.

g. Decontamination procedures.

h. Spill contingency plan.

1.2.3 Other Submittal Requirements

Submit one (1) electronic copy of the Closure Report within 21 calendar days of work completion at the site.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used,

a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Photographic Documentation

Preconstruction Sampling

Onsite Material Handling Plan; G-AOF

SD-03 Product Data

Solidification Agent

SD-06 Test Reports

Operation Records

Submit to the Contracting Officer and City of Superior by the 10th of every month the total volume of treated water discharged to the City of Superior sewer during the previous month.

Treatment water sample results

Post-Removal Sampling; G-AOF

SD-07 Certificates

Qualifications of the testing laboratory

Transportation Documents

SD-11 Closeout Submittals

Closure Report; G-AOF

1.4 REGULATORY REQUIREMENTS

1.4.1 Permits and Licenses

Government will obtain the permits identified below. Contractor shall obtain all other required federal, state, and local permits for dredging and storage of contaminated material. Permits shall be obtained at no additional cost to the Government.

Permitting Agency	Permit
City of Superior	Post-Construction Stormwater Management - Fraser Site
City of Superior	Post-Construction Stormwater Management - Wisconsin Point Landfill
USACE	Section 10/404
Wisconsin Department of Natural Resources (WDNR)	Public Waters Permit (under Wisconsin Statutes Chapter 30)

WDNR	401 Water Quality Permit
WDNR	Notice of Intent (NOI) for Land Disturbing Activity
WDNR	Landfill Plan Modifications

1.4.2 Air Emissions

Air emissions, including dust, shall be monitored and controlled by the Contractor, in accordance with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. Note that Work is exempt from WDNR Air Pollution Construction Permit requirements under Wisconsin Administrative Code NR 406.04(1)(m)9 based on properties of the impacted material.

PART 2 PRODUCTS

2.1 SPILL RESPONSE MATERIALS

Provide appropriate spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. Spill response materials shall be available at all times when contaminated materials/wastes are being handled or transported. Spill response materials shall be compatible with the type of materials and contaminants being handled.

2.2 STAGING AREA MATERIALS

2.2.1 Stone aggregate

Stone aggregate shall be composed of tough, durable particles, adequately free from thin, flat and elongated pieces, and shall be free from debris or other deleterious substances, foreign objects such as frozen material, coal, wood, hay, burlap, paper, plastics, tree roots, pieces of concrete or pavement or contaminants (chemical and/or biological). Stone aggregate shall meet the gradation requirements of WisDOT Standard Specification Section 305.2.1 for 1¼-inch dense-graded base.

2.2.2 Asphalt

Asphalt shall meet the requirements of WisDOT Standard Specifications and consist of:

1. Base Course: Hot Mix Asphalt nominal size No. 3 compacted to a depth of 2.5 inches.
2. Top Course: Hot Mix Asphalt nominal size No. 5 Compacted depth of 1.5 inches.

Install in accordance with the requirements of WisDOT Standard Specifications Section 460. Finished pavement shall be to grades and cross-section, as shown on the Contract Drawings. The surface tolerance shall not exceed ¼ inch in 10 feet and there will be no depression which will retain standing water. Finished pavement shall have sufficiently low permeability and be free of cracks or other defects to prevent construction water contact with underlying soil and groundwater. Contractor shall inspect asphalt daily and maintain in acceptable conditions. Promptly seal any cracks that form within the asphalt.

2.3 SOLIDIFICATION AGENT

Provide all required solidification agent in sufficient quantities to complete solidification of dredged sediment as specified, without delay.

PART 3 EXECUTION

3.1 SURVEYS

Bathymetric surveys shall be referenced horizontally to North America Datum of 1983 (NAD83) - State Plane Minnesota North and vertically to International Great Lakes Datum of 1985 (IGLD85). Upland survey will be referenced to NAD83 State Plane Minnesota North horizontally and North American Vertical Datum of 1988 (NAVD88) vertically. Surveys will be conducted by the Government. Contractor shall coordinate with COR for timely completion of required surveys.

3.2 PHOTOGRAPHIC DOCUMENTATION

Prior to construction of temporary staging areas, Contractor shall collect photographic documentation (or video documentation) of pre-construction conditions of the municipal haul roads, upland staging area(s), and bulkheads and structures adjacent to dredging area(s).

3.3 EXISTING STRUCTURES AND UTILITIES

Contractor shall coordinate with the appropriate utility locating agencies to field locate land-based and water-based utilities. No intrusive activities (e.g., grading, dredging) shall be performed until site utilities have been field located in accordance with SECTION 01 35 13.10 SPECIAL PROJECT PROCEDURES. Take the necessary precautions to ensure no damage occurs to existing structures and utilities. Damage to existing structures and utilities resulting from the Contractor's operations shall be repaired at no additional cost to the Government. Utilities encountered that were not previously shown or otherwise located shall not be disturbed without approval from the Contracting Officer.

3.4 DUST CONTROL

Maintain strict dust control at all times to prevent dust particles from becoming airborne. Apply dust suppressants or water to exposed material (e.g., stockpiles) to control dust. Avoid erosion of exposed material when applying dust suppressants or water.

3.5 CLEARING

Clear areas as required and directed by the Contracting Officer of all trees, stumps, downed timber, brush, rubbish, and matted roots prior to commencing operations. Trees, stumps, roots, brush, and other, vegetation in areas to be cleared shall be cut off flush with or below the original ground surface.

3.6 CONTAMINATED MATERIAL REMOVAL

Areas of contamination shall be dredged as required by Section 35 20 23.53 ENVIRONMENTAL DREDGING. Dredging shall be performed in a manner that will limit spills and the potential for contaminated material to be mixed with uncontaminated material. Use methods and equipment that result in minimal disturbance to remaining material beyond the removal limits. Remove and dispose of any material that becomes contaminated as a result of the

Contractor's operation at no additional cost to the Government. Stage operations to minimize the time the contaminated material is exposed to the weather.

3.7 CONTAMINATED MATERIAL STORAGE

Material shall be placed in temporary storage immediately after dredging to facilitate material processing. The following paragraphs describe acceptable methods of material storage. Storage units shall be in good condition and constructed of materials that are compatible with the material or liquid to be stored. If multiple storage units are required, each unit shall be clearly labeled with an identification number and a written log shall be kept to track the source of contaminated material in each temporary storage unit.

3.7.1 Staging Area(s)

Staging Area(s) shall be constructed to isolate stored contaminated material from the environment. No staging areas shall infringe on areas delineated as wetlands. Staging Area(s) shall be constructed in accordance with the Drawings and shall include:

- a. Asphalt pad constructed in accordance with WisDOT Standard Specifications with asphalt-covered stone berms.
- b. Berms surrounding the stockpile, a minimum of 18 inches in height. Vehicle access points shall also be bermed.
- d. Nonpermeable cover free of holes or other damage to prevent precipitation from entering the stockpile. Non-reinforced covers shall have a minimum thickness of 10 mils. Scrim reinforced covers shall have a minimum weight of 26 lbs/1000 square feet. The nonpermeable cover shall be extended over the berms and anchored or ballasted to prevent it from being removed or damaged by wind. Cover stockpiled contaminated soil at all times when not being worked.

Staging area shall be removed following completion of material handling unless otherwise directed by COR.

3.7.2 Roll-Off Units

Roll-off units used to temporarily store contaminated material shall be water tight. A cover shall be placed over the units to prevent precipitation from contacting the stored material. Liquid which collects inside the units shall be removed and managed in accordance with paragraph Liquid Management.

3.7.3 Liquid Management

Furnish labor, materials, and equipment necessary for collecting, treating, monitoring, and discharging of liquid generated during construction activities at the site in accordance with the liquid management section of the Onsite Material Handling Plan. Conduct dredging and material handling operations at the site in a manner that minimizes the amount of liquid generated. Liquid collected from barges, scows, and staging areas (including stockpiles) shall be transferred to the on-site waste water treatment plant, constructed in accordance with the Drawings.

3.7.3.1 Treatment System Requirements

The Contractor shall be responsible for all aspects of verifying design parameters designing, providing, installing, operating, maintaining, and removing collection, storage, and treatment facilities as required to discharge treated waters within the treatment limits required in paragraph SAMPLING LIQUID. The treatment system shall:

- a. Be sized to hold and treat all construction water, as defined in Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS, generated during implementation of the Work without delay.
- b. Include influent equalization tanks.
- c. Be capable of removing contaminants to below the limit defined in paragraph SAMPLING LIQUID. Processes shall include, at a minimum, filtration vessels and carbon (lead and lag)vessels. Additional processes shall be provided as needed to meet limits.
- d. Include effluent holding tanks designed to allow on-site testing of water quality prior to discharge.
- e. Include recycle capability for retreatment of effluent not meeting the discharge requirements of this specification, as determined by on-site testing.
- f. Include influent and effluent flow totalizer to monitor and record discharges to the City of Superior sewers.

3.7.3.2 Treatment System Operations

Monitor, test, and adjust the treatment system in accordance with the Onsite Material Handling Plan or as otherwise modified by special regulatory requirements. If there is a conflict between requirements, the more stringent requirement shall prevail.

3.7.3.3 Discharge of Treated Water

Maintain a copy of the City of Superior discharge permit on site and comply with all requirements of the discharge permit. Do not discharge any water until tests results collected as defined in paragraph SAMPLING LIQUID are approved by City of Superior. The City of Superior reserves the right to require additional testing or halt discharge if there are any concerns to the City of Superior publicly owned treatment works.

Discharge of the treated water shall be to the City of Superior sewer only at the location shown in the Drawings and during non-storm events. Contractor responsible for installing controls to protect and maintain existing road traffic and protect the temporary pipeline. The discharge location must be covered anytime it is not being attended. Discharge to City of Superior sewers during wet weather (during or within 24 hours following storm event of 0.5-inches of rain or greater) or that could cause overflow events are strictly prohibited. Maintain operation records, including quantity of water discharged to the City of Superior sewer and submit on a monthly basis.

Discharge of water to the bay or slips is strictly prohibited.

3.7.3.4 Cleanup and Removal of Treatment System

Upon completion of work, close and remove from the site the water treatment system. Restore the site to its original condition. Decontaminate equipment in accordance with the Contractor's Onsite Material Handling Plan. Containerize, sample, test, and dispose of carbon, residues, cleaning aids, and decontamination solid waste as specified for the contaminated solids. Decontamination liquids shall be containerized and disposed of at an approved disposal facility licensed to accept such liquid wastes.

3.8 CONTAMINATED MATERIAL DEWATERING

Sediment processing activities shall be performed within the staging area. Sediment shall be allowed to gravity dewater for a minimum of 24 hours. Water collected from dewatering efforts shall be managed in accordance with paragraph LIQUID MANAGEMENT. If gravity dewatering alone is not sufficient to meet requirements, a solidification agent shall be added. Thoroughly mix solidification agent into dredged material to achieve homogeneous mixture throughout. The ratio and actual amounts of solidification agent shall be determined by the Contractor based on field conditions and results of provided treatability testing provided in Attachment A. Known dewatering and stabilization requirements are discussed in the Dewatering Treatability Study Report provided in Attachment A. Requirements for selected offsite disposal facilities shall be confirmed by the Contractor prior to commencing work. Only the minimum amount of stabilization agent necessary to achieve requirements shall be used. Amounts of stabilization agent used shall be accurately measured and documented by the Contractor.

3.9 SAMPLING

3.9.1 Sampling Laboratory Requirements

Propose the analytical laboratories to be used for the sample analyses. Perform testing by a DoD ELAP accredited commercial testing laboratory or the Contractor's validated testing facility. Analytical laboratories shall also be accredited through the Wisconsin Department of Natural Resources Laboratory Certification Program for all parameters that have such certifications and meet the criteria outlined in NR 149. Sample analysis shall meet the requirements of NR 700.13. Submit qualifications of the testing laboratory which shall be certified to perform the tests required and achieve the required detection limits. If a proposed analytical laboratory cannot meet specified analytical requirements, select another laboratory at no additional cost to the Government.

3.9.2 Sampling Liquid

Liquid with contaminant levels that exceed action levels shall be treated onsite. Treatment shall be in accordance with paragraph LIQUID MANAGEMENT. Liquid treated at the onsite waste water treatment plant shall be sampled by the Contractor as required by the City of Superior. One sample shall be tested for the following or as otherwise required by the City of Superior:

Chemical Parameter	Method	Frequency	Action Level
Total Suspended Solids	EPA Method 160.2	Initial	500 mg/L
pH		Initial	5.5 - 9.5
Total PAHs	EPA SW-846 8270	Initial	10 ppb
Mercury	EPA SW-846 7470	Initial	0.02 mg/L
Lead	EPA SW-846 6010	Initial	15.20 mg/L
Cadmium	EPA SW-846 6010	Initial	1.15 mg/L
Copper	EPA SW-846 6010	Initial	10.45 mg/L

Treatment water sample results shall be submitted to the Contracting Officer and City of Superior for approval prior to initial discharge. If the treated liquid sample fails to meet the requirements, the Contractor shall modify the system and resample until the action levels are met and at no additional cost to the Government.

Following initial discharge to the City of Superior, Contractor shall visually monitor discharge at all times for signs of increased turbidity. If increased turbidity is noted, Contractor shall adjust system operations or perform maintenance on the system, as necessary and appropriate, to minimize discharge turbidity.

3.9.3 Sampling Beneath Staging Areas

Samples from beneath each staging area shall be collected prior to construction of and after removal of the storage unit. Samples shall be collected from a depth interval of 0 to 0.5 feet and shall be tested for the following:

Chemical Parameter	Method
PAHs	EPA SW-846 8270
Tributyltin	TA SOP No. BR-GC-008
Mercury	EPA SW-846 7470
Lead	EPA SW-846 6010

3.9.3.1 Preconstruction Sampling

Preconstruction samples shall be collected at a minimum of once per staging area or a frequency of one per each 500 square yards, whichever is greater.

3.9.3.2 Post-Removal Sampling

Post-removal samples shall be collected immediately after the removal of the staging area and prior to restoration. Post-removal samples shall be collected at the same location as pre-construction samples. Additional samples shall also be collected from locations where tears were noted in the staging area geomembrane (if any). Based on test results, soil which has become contaminated above preconstruction levels shall be removed at no additional cost to the Government. Contaminated material which is removed from beneath the staging area shall be transported offsite to an approved offsite treatment, storage or disposal (TSD) facility. Sampling and analyses required by the TSD facility for disposal of the material shall be the responsibility of the Contractor and shall be performed at no additional cost to the Government. Documentation of all analyses performed shall be furnished to the Contracting Officer. As directed by the Contracting Officer and at no additional cost to the Government, additional sampling and testing

shall be performed to verify areas of contamination found beneath staging areas have been cleaned up to preconstruction levels.

3.10 SPILL CONTINGENCY PLAN

Develop and implement written spill containment/control procedures. Describe prevention measures, such as building berms or dikes; spill control measures and material to be used (e.g., booms, vermiculite); location of the spill control material; personal protective equipment required to cleanup spills; disposal of contaminated material; and who is responsible to report the spill. Storage of contaminated material must be appropriately bermed, diked and contained to prevent any spillage of material on uncontaminated soil. Provide control as required by Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. Immediate containment actions shall be taken to minimize the effect of any spill or leak. Cleanup shall be in accordance with applicable federal, state, and local regulations. If the spill or discharge is reportable, or human health or the environment are threatened, notify the National Response Center, the state, and the Contracting Officer as soon as possible. As directed by the Contracting Officer, additional sampling and testing shall be performed to verify spills have been cleaned up. Spill cleanup and testing shall be done at no additional cost to the Government.

3.11 TRANSPORTATION AND DISPOSAL REQUIREMENTS

Offsite transportation and disposal of contaminated material shall be in accordance with Section 02 61 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS.

3.12 CLOSURE REPORT

The Closure Report shall be labeled with the contract number, project name, location, date, name of general Contractor, and the Corps of Engineers District contracting for the work. The Closure Report shall include the following information as a minimum:

- a. A cover letter signed by a responsible company official certifying that all services involved have been performed in accordance with the terms and conditions of the contract documents and regulatory requirements.
- b. A narrative report including, but not limited to, the following:
 - (1) quantity of materials removed from each area of contamination referencing dredging data collected in accordance with Section 35 20 23.53 ENVIRONMENTAL DREDGING;
 - (2) quantity of materials processed and stabilized, including quantity of solidification agent used;
 - (3) sampling locations and sampling methods;
 - (4) sample collection data such as time of collection and method of preservation; and
 - (5) sample chain-of-custody forms.

- c. Copies of all chemical and physical test results in both hardcopy and electronic data format.
- d. Copies of all manifests and land disposal restriction notifications.
- e. Copies of all certifications of final disposal signed by the responsible disposal facility official.
- f. Waste profile sheets.
- g. Figures showing all investigation sample locations and data.
- h. Scale drawings showing limits of dredging, limits of contamination, known underground utilities, sample locations, and sample identification numbers. On-site stockpile, storage, treatment, and loading areas shall also be shown on the drawings.
- i. Progress Photographs. Color photographs shall be used to document progress of the work. A minimum of four views of the site showing the location of the area of contamination, entrance/exit road, and any other notable site conditions shall be taken before work begins. After work has been started, activities at each work location shall be photographically recorded weekly. Photographs shall be a minimum of 3 by 5 inches and shall include:
 - (1) Staging area construction.
 - (2) Sediment removal and sampling.
 - (3) Unanticipated events such as spills and the discovery of additional contaminated material.
 - (4) Contaminated material/water storage, handling, treatment, and transport.
 - (5) Site or task-specific employee respiratory and personal protection.
 - (6) Post-construction photographs. After completion of work at each site, take a minimum of four views of each work area.

A digital version of all photos shown in the report shall be included with the Closure Report. Photographs shall be included in a photograph log that includes the following information for each photograph:

Project Name:	Direction of View:
Location:	Date/Time:
Photograph No.:	Description of View:

3.13 ATTACHMENT

The document listed below and attached following this Section's "End of Section" designation is part of this Technical Specification Section:

Howards Bay SND and GLLA Dredging
AS AWARDED

1. Attachment A: Dewatering Treatability Study Report (240 pages)

-- End of Section --

MEMO

To:

United States Army Corps of
Engineers – Steve Rumble, Nancy
Salisbury, and Eric Malburg

Copies:

Arcadis U.S., Inc.
One Lincoln Center
110 W Fayette Street
Suite 300
Syracuse, NY 13202

From:

Arcadis

Date:

March 8, 2018

Arcadis Project No.:

16935001.0000

Subject:

Howard's Bay Sediment Dewatering Treatability Study Report

Introduction and Background

This sediment dewatering memorandum describes the methods and results of the treatability study conducted to evaluate the optimal stabilization amendment(s) to support the Great Lakes Legacy Act (GLLA) sediment cleanup project in Howards Bay, located in the City of Superior in Douglas County in northwest Wisconsin (site). The goal of the sediment cleanup project is to remediate impacted sediment and restore Howards Bay through environmental dredging and associated material handling, processing, and disposal along with cover placement as needed. A stabilization amendment will be necessary to allow transport of the dredged sediment over public roads, support a stable cover at the placement location, and limit potential future leaching of chemical impacts at the placement location. This memorandum was prepared under contract W911XK-16-C-0019 to the United States Army Corps of Engineers (USACE) Detroit District and in coordination with the Howards Bay Project Partners (Partners), which include the United States Environmental Protection Agency (USEPA) Great Lakes National Program Office (GLNPO), the Wisconsin Department of Natural Resources (WDNR), Fraser Shipyards, Inc. (Fraser), and the City of Superior (City). The USACE is providing technical and engineering support to USEPA for this project.

Following sediment removal, dredged material will be placed on a barge for transport to an upland staging area for processing and then trucked over public roads for transportation to the final placement location. WDNR issued criteria for placement of the material at the Wisconsin Point Landfill (Attachment 1), which will be the primary placement location. Materials that do not meet the defined Wisconsin Point Landfill

placement criteria will be transported to a commercial disposal facility, unless the material has a pH exceeding 12 standard units, in which case the material would require significant amendment to reduce the pH or disposal at a facility licensed to receive such material. A stabilization agent will be blended with the sediment using the optimal amount needed to meet transportation (no free liquid using USEPA Method 9095B), strength (as defined in the Performance Objectives below), and chemical mobility requirements (as defined by WDNR). Results from this treatability study provide additional information on blending agents and ratios for use in planning material management requirements.

Eight sediment samples representing varying sediment geotechnical and contaminant profiles across the site were collected in June 2017 by USEPA and WDNR. An overview of the sample collection, including sampling locations, is provided in Attachment 2. This overview was prepared by the WDNR in July 2017 and summarizes both the treatability study field work along with analytical results of other sampling that WDNR performed concurrently with the treatability sample collection. Two five-gallon buckets were filled for each of the eight locations and shipped to the Arcadis Treatability Laboratory in Durham, North Carolina. These samples remained sealed in a controlled environment from the time of receipt until the treatability study commenced. The Arcadis Treatability Laboratory was responsible for preparing samples, performing certain testing directly, and coordinating the remaining testing with JLT Laboratories, Inc. (JLT) a subcontracted geotechnical laboratory in Canonsburg, Pennsylvania, and TestAmerica North Canton a subcontracted analytical chemistry laboratory in North Canton, Ohio.

Performance Objectives

Dewatering stabilization of the excavated materials will need to meet the following performance standards:

- Materials being transported offsite must be sufficiently dewatered to meet the requirement of no free liquid using USEPA Method 9095B (“paint filter testing”) in conformance with 40 CFR §264.314(b). In addition, the stabilization process should minimize the amount of free water released from the stabilized material as a result of transportation (“shake testing”).
- Materials disposed of at Wisconsin Point Landfill must meet minimum strength standards to be suitable for supporting additional material and the final cover system with limited consolidation. Materials will be required to develop measurable strength and show an increase in strength over time (beyond 7 days).
- Document leaching characteristics using USEPA Method 1312, Synthetic Precipitation Leaching Procedure (SPLP).

Amendments Tested

Dewatering reagents are considered admixtures that are capable of physically or chemically binding water to result in improved sediment handling characteristics (resulting in passing paint filter testing).

Solidification reagents are considered admixtures that result in the development of strength formation. The treatability study was designed to select an amendment that will serve both functions.

The performance of the following admixtures were evaluated during this treatability study:

- Portland cement (PC) – La Farge
- Cement kiln dust (CKD) – La Farge

- Calciment – Mintek Resources, Inc.

Phased Testing Procedures and Results

To allow for adaptive decision making regarding successful dewatering/solidification strategies, the treatability study was conducted using a multi-step, phased approach during which the results from each step were discussed internally with the Arcadis project team and then the Project Partners, who then guided further bench scale considerations in real time.

Step 1 (Baseline): Sample Preparation and Baseline Analyses

Two 5-gallon Department of Transportation rated buckets of sediment from each of the eight locations (total of sixteen 5-gallon buckets) were shipped to the Arcadis Treatability Laboratory in sealed, screw-top plastic buckets. The samples were stored at ambient room temperature inside the original containers until further processing. The two five-gallon buckets from each location were composited together within a plastic 12-gallon bucket using an electric drill and steel mixing auger. The auger was decontaminated between each sediment mixing event to prevent cross contamination. Duplicate moisture samples of each composited sediment were collected and processed gravimetrically by oven drying (103-105°C) to support calculation of subsequent admixture addition rates on a per unit sediment dry mass basis. Moisture content data¹ are presented in Table 1.

One-gallon subsamples of each homogenized sediment sample were collected in plastic buckets and submitted to JLT for baseline grain size and Atterberg limits analysis by ASTM D422 and ASTM D4318, respectively. Additionally, five-gallon subsamples of sediment from locations HB17-03, HB17-05, and HB17-06 were containerized in plastic five-gallon buckets and shipped to JLT for baseline compaction testing by ASTM D698. These three samples were selected as representative of the anticipated average sediment conditions at the site. The results of the baseline geotechnical characterization are presented in Table 2 with the compaction results presented in Attachment 3. All samples failed both the paint filter and shake tests based on visual observation, as summarized in Table 3.

The scope of work for the treatability study listed compression testing by ASTM D2850 as a component of the Step 1 regimen. Based on the compaction test results, the samples would require a minimum 80% reduction in moisture to achieve measurable strength for the compression test. This reduction would not be feasible without processing the material, at which point the data would no longer represent baseline conditions. As such, the baseline compression tests were not performed.

Subsamples of each composited sediment were collected in 250-milliliter (mL) widemouth glass jars and submitted to TestAmerica for the following analyses. All organotin analyses were subcontracted to and performed by TestAmerica Burlington Vermont.

- Leachable polycyclic aromatic hydrocarbons (PAHs) by SPLP, USEPA Methods 1312/8270
- Leachable metals by SPLP, USEPA Methods 1312/6010 (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver, Thallium, Mercury)

¹ Gravimetric moisture content measures the mass of water per mass of dry soil in a given sample. Geotechnical moisture content measures the volume of water per volume of soil in a given sample.

- Leachable organotins by SPLP, USEPA Method 1312, TestAmerica Standard Operating Procedure (SOP) for organotins - Gas Chromatography (GC) with Flame Photometric Detector (FPD)
- Total RCRA metals by USEPA Methods 6010/7471
- Total PAHs by USEPA Method 8270
- Total organotins by TestAmerica SOP (GC/FPD)
- Chloride of SPLP leachate by Method 4500
- Hardness of SPLP leachate by Method 130.1/2340
- Alkalinity of SPLP leachate by Method 310.1
- Specific conductance of SPLP leachate by Method 9050A

Summarized results of baseline chemical characterization are presented in Table 4; full results are presented in Attachment 4.

Step 2. Initial Sediment Dewatering/Solidification

An initial series of 24 test mix recipes were created as detailed in Table 5 (Mixes 1 through 24). The three dewatering admixtures, PC, calciment, and CKD, were added to 500-gram subsamples of each of the eight composite sediments at 10% addition rates by sediment dry mass. The mixes were blended in a 3-inch by 6-inch plastic geotechnical mold using an electric drill and stainless-steel mixing propeller until visually homogenous. Following mixing, approximately 100 grams of each mix was split into a 250-mL plastic bottle and the remainder was placed into a 500-mL widemouth glass jar.

One hour after mixing, a subsample of each mix was pulled from the glass jar and used to support paint filter testing for free liquids. At 24 hours of curing, subsamples were collected from the jars and tested for moisture content. "Shake testing" was also conducted at 24 hours of curing using the subsamples of each mix in 250-mL plastic bottles. The amended samples were placed on a shaker table for one hour to simulate truck transport to determine the potential for liberation of free water.

The results of paint filter testing, shake testing, and moisture content analysis on each of the 24 mixes are presented in Table 6. All Step 2 mixes passed the paint filter test at the one-hour curing interval. Some free water was observed in the shake test samples using 10% calciment or 10% CKD in sediments from locations HB17-01, HB17-02, HB17-03, and HB17-08. All three admixtures (PC, calciment, and CKD) resulted in a slight reduction of free moisture content as determined by gravimetric moisture analysis compared with baseline sediment moisture content. There were no significant differences observed in the moisture content between the three admixtures.

In addition to these quantitative tests, qualitative observations were made regarding dust and heat generation during mixing. Neither dust nor heat were generated at a noticeable level for the mixtures prepared in Step 2.

Step 3: Additional Sediment Dewatering/Solidification and Analysis of Test Results

The iterative process in Step 3 focused on narrowing the potential reagent selection based on all data collected to that point. As such, the testing focused on specific samples and reagents as the testing progressed.

Following the interpretation of the results of Step 2 testing, a second round of 24 mixes (Mixes 25 through 48) were created as detailed in Table 7. These mixes, which received 7.5% dosages of the respective admixtures by sediment dry mass, were created and tested in the same manner as Mixes 1 through 24. Paint filter testing was conducted after one hour of curing, with shake testing (one-hour duration) and moisture content analysis performed at 24 hours of curing. The decision to reduce the blending dosage from 10% in Step 2 to 7.5% was based on the generally positive paint filter and shake test results.

The results of paint filter testing, shake testing, and moisture content analysis on each of the initial 24 Step 3 mixes are presented in Table 8. All Step 3 mixes passed the paint filter test at the one-hour curing interval and passed the 24-hour shake test.

As noted above, some free water was observed in the Step 2 shake test samples using 10% calciment and 10% CKD in sediments from locations HB17-01, HB17-02, HB17-03, and HB17-08. As a release of free water was not observed in the 7.5% admixture addition mixes, it is likely the Step 2 observations were an artifact of a difference in the sample curing procedure used for Mixes 1 through 24 versus Mixes 25 through 48. The shake test samples for the first round of mixes were immediately placed into the shake test bottles following mixing and then cured for 24 hours. The second round of shake test samples were placed into the bottles following the 24-hour cure time, after the mixes had been re-homogenized to obtain moisture content samples. The free water observed in select 10% admixture mixes could therefore be associated with settling during the 24-hour curing period rather than the shake test itself.

All three admixtures (PC, calciment, and CKD) resulted in a slight reduction of free moisture content as determined by gravimetric moisture analysis compared with baseline sediment moisture content. There were no significant differences observed in the moisture content between the three admixtures, or between the Step 2 and Step 3 (10% and 7.5% doses) of the same admixture on identical sediments.

Visual observations by the laboratory staff indicated that, although the material tested to this point had passed results, there did not appear to be enough strength in the material. The Step 2 and 3 results also showed that CKD and calciment provided similar moisture content results, and both appeared to provide less strength than PC. Therefore, CKD was removed from further consideration based on both test results and comparative availability and cost during construction compared to calciment. A series of seven mix recipes were created as detailed in Table 9. These mix recipes were formulated based on the results of the Step 2 and 3 trials and used to further optimize the reagent addition rates, specifically relating to the potential for bearing strength development. Utilizing HB17-08 sediment, which had the highest water content of the eight composite sediment samples, allowed for a conservative estimate of strength development.

Mixes were blended in a 3-inch by 6-inch plastic geotechnical mold using an electric drill and stainless steel mixing propeller, then transferred into a 2-inch by 4-inch plastic geotechnical mold. The molds were tapped during filling to preclude the entrapment of air bubbles, then placed in a plastic Ziploc bag for curing in a humid environment under ambient laboratory temperature. Each mix was tested for strength development using a soil penetrometer at one, four, five, six, and seven days of curing. A soil penetrometer is a device that utilizes a calibrated spring to instantly estimate unconfined compressive strength of cohesive soils/sediments in laboratory or field settings. Soil penetrometer testing was not included in the original scope; however, testing was added in lieu of further iterative testing to provide

short turnaround data for an array of samples to allow productive discussions with and decisions from the Project Partners.

The results of soil penetrometer screening are presented in Table 9. The 5% PC mix and all three of the calciment mixes failed to attain measurable strength by day seven. The 10% PC mix developed measurable strength at day one, but was not observed to continue developing strength from four to seven days of curing after registering 0.5 tons per square foot (tsf) at day four. The 7.5% PC mix did not register strength after one day of curing, but showed 0.25 tsf at day four with no further increases by day seven. The 20% PC mix registered 1.25 tsf after one day of curing, and continued to develop additional strength at each measured interval until day six. No penetrometer reading was attained on the 20% PC mix at day seven, as the surface of the cylindrical molded sample was compromised from previous testing.

In addition to these quantitative tests, qualitative observations were made regarding dust and heat. Neither dust nor heat was generated at a noticeable level for the mixtures prepared in Step 3.

Step 4. Final Mix Design Testing

The majority of the Step 4 tests only applied to material scheduled for placement in Wisconsin Point Landfill. These requirements were selected to facilitate WDNR approval of material placement and/or for potential discussions with interested tribal parties. The testing required for material scheduled for disposal at an offsite, commercial facility was limited to paint filter, shake, and pH tests.

Following the evaluation of results from Steps 2 and 3 described above, two final test mixes were formulated for contaminant stabilization and geotechnical performance testing as detailed in Table 10. The first mix used sediment from location HB17-04 and a PC addition rate of 10% by sediment dry mass ("Step 4 Mix 1"). HB17-04 sediment was selected as field analyses indicate the highest historical concentrations of tributyltin at that location. The second mix used sediment from location HB17-08 and a PC addition rate of 7.5% ("Step 4 Mix 2"). HB17-08 sediment was selected for this mix as it contains the highest water content of the eight locations and presents a conservative scenario for geotechnical performance verification. The PC reagent and doses were selected based on the ability of these blends to pass both the paint filter and shake testing and the anticipated material strength from the soil penetrometer readings.

The PC doses were blended into the sediments in a five-gallon plastic bucket using an electric drill and steel mixing auger until visual homogeneity was achieved. Subsamples of each mix were placed into 500 mL clear glass widemouth jars and sent to TestAmerica for the following analyses:

- Leachable PAHs by SPLP, USEPA Methods 1312/8270
- Leachable metals by SPLP, USEPA Methods 1312/6010/7471
- Leachable organotins by SPLP, USEPA Method 1312, TestAmerica SOP for organotins - GC/Mass Spectrometry (MS) with selective ion monitoring (SIM)
 - Note: due to matrix interferences encountered by TestAmerica Burlington during initial analysis of the Step 4 mixes by TestAmerica's SOP for organotins, the method was changed to GC/MS-SIM during Step 4 testing.
- Chloride of SPLP leachate by Method 4500
- Hardness of SPLP leachate by Method 130.1/2340
- Alkalinity of SPLP leachate by Method 310.1

- Specific conductance of SPLP leachate by Method 9050A
- pH by Method 9045

The remaining volume of each mix was retained in the five-gallon buckets and sent to JLT for geotechnical performance verification, which included:

- Standard proctor compaction analysis by ASTM D698
- Unconsolidated-undrained triaxial compression analysis by ASTM D2850 (UU triaxial test)

The original scope of work also included sieve analysis and Atterberg limits for the Step 4 regimen. These tests were included without knowing the baseline data and final admixture(s). When PC mixes with soil, particles connect with the lime and create larger, interconnected particles. A sieve analysis on material blended with PC would no longer indicate an accurate representation of the soil breakdown. It was determined that Atterberg testing would not provide useful data beyond the compression test performed on the mixed soils given the baseline Atterberg limits. For these reasons, the sieve analysis and Atterberg limits were omitted during Step 4.

The laboratory report provided by JLT Laboratories can be found in Attachment 3. Results of the Standard proctor compaction analysis indicated maximum dry densities of 64.7 pounds per cubic foot (pcf; 95% compaction) and 59.9 pcf (88% compaction) for "Step 4 Mix 1", and 63.7 pcf (95% compaction) and 59.0 pcf (88% compaction) for "Step 4 Mix 2". Results for the UU triaxial tests indicate shear strengths are 19.611 psi and 21.875 psi for "Step 4 Mix 1" and "Step 4 Mix 2", respectively. "Step 4 Mix 2" was created using HB17-08 which was determined to be the critical sample in the treatability testing program.

Summarized results of chemical analysis on the Step 4 mixes are presented in Table 11; full results are presented in Attachment 4. There were no detections of leachable PAHs or organotins in either of the Step 4 mixes. Low-level detections of several metals (arsenic, barium, and chromium) in the Step 4 leachates were seen at concentrations slightly greater than baseline results for the respective unamended sediments. Note that in the Arcadis Treatability Laboratory's past experience, PC may contain some heavy metals, most notably chromium (See <https://www.osha.gov/SLTC/chromium/index.html> for Occupational Safety and Health Administration precautions for workers that handle PC). The addition of PC to the sediments increased the pH of both mixes to >12 standard units. As a result, additional paint filter, shake, and pH tests were performed to determine that 4% calciment is sufficient to provide stabilized material for on-road transport with pH 11.8 standard units. The material does not have appreciable strength for placement at Wisconsin Point Landfill but meets the requirements for offsite disposal at a commercial facility. Results from these additional tests are presented in Table 12.

Tribal Support

Several parameters were tested to facilitate discussions with interested tribal parties. These parameters include chloride, hardness, alkalinity, and specific conductance of the potential leachate. The results of these analyses are included in Table 4 for baseline samples and Table 11 for amended samples. The only parameter with published regulatory guidelines in Wisconsin is chloride, which has a maximum contaminant level (MCL) of 250 mg/L². The data from this study show that chloride levels in leachate will be well below the MCL, with a maximum analyzed concentration of 33 mg/L for amended sediment.

² Wisconsin Department of Natural Resources Drinking Water & Groundwater Quality Standards/Advisory Levels. Viewed February 15, 2018 at <http://dnr.wi.gov/topic/drinkingwater/documents/halttable.pdf>.

Conclusions

Through initial testing in Step 2 and additional testing in Step 3, this treatability testing program identified 10% and 7.5% addition rates by sediment dry weight of PC as effective for the reduction of free water content of site sediments to pass paint filter test. No free water was liberated from the 7.5% PC mixes during shake testing, which simulated transport via dump truck. As previously discussed, the free water observed in several of the 10% PC mixes in Step 2 was possibly due to discrepancies in the sample curing procedure. Soil penetrometer screening and laboratory geotechnical testing indicated that the 10% PC and 7.5% PC mixes developed strength in the HB17-08 sediments, which presented the most conservative scenario from a water content perspective. Chemical leachability testing in Step 4 demonstrated a reduction in the leaching of several PAHs in both mixes. Some low-level leaching of several metals was observed in both Step 4 mixes; however, these concentrations were not significantly greater than those seen during SPLP analysis on the unamended sediment composites used during Step 4 (HB17-04 and HB17-08).

The testing shows that a minimum of 7.5% PC meets the test objectives for stabilizing material that will be placed at Wisconsin Point Landfill (passing paint filter, no free water on arrival, and sufficient strength to support additional material and cover), and a minimum of 4% calciment meets the test objectives for stabilizing material requiring disposal at a commercial facility (passing paint filter, no free water on arrival, and pH < 12 standard units).

Attachments

Tables

Attachment 1 – Wisconsin Point Landfill Disposal Criteria Memo

Attachment 2 – Summary of 2017 Howards Bay Sediment Sampling and Contract Laboratory Results

Attachment 3 – Geotechnical Laboratory Data

Attachment 4 – Chemical Laboratory Data

TABLES



Table 1. Step 1 - Baseline Moisture Content

Pan	Sample ID	Pan wt. (g)	Pan + Wet (g)	Pan + Dry (g)	Gravimetric Moisture	Average Gravimetric Moisture	Geotechnical Moisture	Average Geotechnical Moisture
1	HB17-01 (A)	2.235	79.376	44.157	45.66%	45.12%	84.01%	82.22%
2	HB17-01 (B)	2.175	80.205	45.42	44.58%		80.44%	
3	HB17-02 (A)	2.178	93.61	53.668	43.69%	43.43%	77.58%	76.77%
4	HB17-02 (B)	2.224	84.04	48.72	43.17%		75.96%	
5	HB17-03 (A)	2.174	80.677	38.346	53.92%	53.72%	117.03%	116.10%
6	HB17-03 (B)	2.159	74.723	35.882	53.53%		115.18%	
7	HB17-04 (A)	2.174	87.246	46.148	48.31%	47.69%	93.46%	91.21%
8	HB17-04 (B)	2.206	97.66	52.721	47.08%		88.96%	
9	HB17-05 (A)	2.171	98.177	48.867	51.36%	51.02%	105.60%	104.17%
10	HB17-05 (B)	2.177	94.155	47.543	50.68%		102.75%	
11	HB17-06 (A)	2.18	89.178	51.829	42.93%	43.07%	75.23%	75.66%
12	HB17-06 (B)	2.221	93.293	53.939	43.21%		76.09%	
13	HB17-07 (A)	2.166	122.847	94.147	23.78%	23.43%	31.20%	30.61%
14	HB17-07 (B)	2.185	102.921	79.665	23.09%		30.02%	
15	HB17-08 (A)	2.196	82.129	38.337	54.79%	54.83%	121.17%	121.37%
16	HB17-08 (B)	2.21	78.752	36.755	54.87%		121.57%	

Table 2. Step 1 - Baseline Geotechnical Characterization Results

Sample ID	Atterberg Limits			Particle Size Distribution						
	Plastic Limit	Liquid Limit	Plasticity Index	Percent Gravel		Percent Sand			Percent Fines	
				Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
HB17-01	28	37	9	0.0%	0.4%	1.2%	7.3%	26.1%	65.0%	
HB17-02	30	42	12	3.1%	6.9%	3.8%	8.1%	38.6%	39.5%	
HB17-03	34	53	19	0.0%	1.5%	2.8%	5.2%	25.6%	64.9%	
HB17-04	38	51	13	0.0%	4.4%	3.7%	5.7%	14.1%	72.1%	
HB17-05	44	52	8	0.0%	3.1%	3.4%	5.2%	17.3%	71.0%	
HB17-06	33	47	14	0.0%	1.4%	3.8%	7.0%	26.4%	61.4%	
HB17-07	21	26	5	0.0%	3.0%	1.7%	19.4%	42.7%	33.2%	
HB17-08	40	56	16	0.0%	1.2%	2.2%	3.9%	13.2%	79.5%	

Table 3. Step 1 - Baseline Sediment Performance Results

Sample ID	1-HR Paint Filter Result (Pass/Fail)	24-Hour Shake Test (Free Water Released?)
HB17-01	Fail	Yes
HB17-02	Fail	Yes
HB17-03	Fail	Yes
HB17-04	Fail	Yes
HB17-05	Fail	Yes
HB17-06	Fail	Yes
HB17-07	Fail	Yes
HB17-08	Fail	Yes

Table 4. Step 1 - Baseline Sediment Analytical Results

Sample ID:	HB17-01		HB17-02		HB17-03		HB17-04		HB17-05		HB17-06		HB17-07		HB17-08	
Sample Targets:	Typical grain size for Area 1		Highest Hg		High fines		Highest TBT, high fines		High fines, typical grain size for Frog Pond		High TBT, typical grain size for Area 2		Highest Pb/Hg in FC/OC, high fines		High Pb	
DMU:	OC-17		HS-3		CS-4		HS-1		FP-2		FC-2		OC-11		FS-2	
Analyte	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Leachable Semivolatile Organic Compounds (GC/MS) - SPLP East by USEPA Method 8270C (µg/L)																
Acenaphthene	0.15	J	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	0.22	J
Acenaphthylene	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
Anthracene	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
Benzo[a]anthracene	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
Benzo[b]fluoranthene	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
Benzo[k]fluoranthene	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
Benzo[g,h,i]perylene	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
Benzo[a]pyrene	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
Chrysene	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
Dibenz[a,h]anthracene	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
Fluoranthene	<50	ND	<50	ND	<50	ND	0.10	J	<50	ND	<50	ND	0.12	J	0.12	J
Fluorene	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
Indeno[1,2,3-cd]pyrene	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
1-Methylnaphthalene	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
Naphthalene	<50	ND	0.11	J	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND	<50	ND
Phenanthrene	0.13	J	0.31	J	0.16	J	0.18	J	0.19	J	<50	ND	0.18	J	0.20	J
Pyrene	<50	ND	<50	ND	<50	ND	0.092	J	<50	ND	<50	ND	<50	ND	0.07	J
Leachable Organotins/GC - Organotins (GC/FPD) - SPLP East (µg/Kg)																
Tetrabutyltin	<0.051	ND	<0.054	ND	<0.057	ND	<0.052	ND	<0.053	ND	<0.053	ND	<0.054	ND	<0.052	ND
Tributyltin	<0.045	ND	<0.047	ND	<0.050	ND	<0.045	ND	<0.047	ND	<0.047	ND	<0.047	ND	<0.046	ND
Dibutyltin	<0.039	ND	<0.041	ND	<0.043	ND	<0.039	ND	<0.041	ND	<0.041	ND	<0.041	ND	<0.040	ND
Monobutyltin	<0.62	*cn	<0.65	*cn	<0.69	*cn	<0.63	*cn	<0.65	*cn	<0.65	*cn	<0.65	*cn	<0.63	*cn
Leachable Metals (ICP) - SPLP East by USEPA Method 6010B (mg/L)																
Arsenic	0.0041	J	<0.050	ND	0.0046	J	0.004	J	0.0037	J	0.0036	J	0.0076	J	<0.050	ND
Barium	0.018	J	0.013	J	0.017	J	0.017	J	0.021	J	0.015	J	0.027	J	0.031	J
Cadmium	<0.050	ND	0.00033	JB	0.00037	JB	0.00033	JB	<0.050	ND	0.00033	JB	0.00043	JB	<0.050	ND
Chromium	0.0014	J	0.0016	J	0.0028	J	0.0022	J	0.0025	J	0.0021	J	0.0063	J	0.00093	J
Lead	<0.050	ND	<0.050	ND	0.0039	J	0.0021	J	0.0027	J	<0.050	ND	0.0037	J	<0.050	ND
Selenium	<0.050	ND	<0.050	ND	<0.050	ND	<0.050	ND	<0.050	ND	<0.050	ND	<0.050	ND	<0.050	ND
Silver	<0.050	ND	<0.050	ND	<0.050	ND	<0.050	ND	<0.050	ND	<0.050	ND	<0.050	ND	<0.050	ND
Thallium	<2.0	ND	<2.0	ND	<2.0	ND	<2.0	ND	<2.0	ND	<2.0	ND	<2.0	ND	<2.0	ND
Leachable Mercury (CVAA) - SPLP East by USEPA Method 7470A (mg/L)																
Mercury	<0.0020	ND	<0.0020	ND	<0.0020	ND	<0.0020	ND	<0.0020	ND	<0.0020	ND	<0.0020	ND	<0.0020	ND
Total Semivolatile Organic Compounds (GC/MS) by USEPA Method 8270D (µg/Kg)																
Acenaphthene	36		88		65		87		48		45		25		190	
Acenaphthylene	16		16		32		39		28		33		53		71	
Anthracene	69		210		150		160		98		110		130		370	
Benzo[a]anthracene	140		320		450		480		240		280		340		940	
Benzo[b]fluoranthene	210		340		540		630		330		370		400		1300	
Benzo[k]fluoranthene	87		140		190		210		120		150		170		430	
Benzo[g,h,i]perylene	110		120		280		370		170		190		200		570	
Benzo[a]pyrene	140		290		410		460		250		280		330		880	
Chrysene	190		310		510		550		310		350		330		1200	
Dibenz[a,h]anthracene	22		34		89		88		47		52		55		140	
Fluoranthene	350		840		960		1100		520		630		940		2200	
Fluorene	52		120		96		100		78		81		100		240	
Indeno[1,2,3-cd]pyrene	95		120		240		310		150		170		200		530	
Naphthalene	56		53		180		190		170		160		75		320	
Phenanthrene	210		860		690		780		420		480		850		1600	
Pyrene	260		640		820		930		470		540		670		1800	
Total Organotins/GC - Organotins (GC/FPD) (µg/Kg)																
Tetrabutyltin	<3.2	ND	<9.4	ND	<3.6	ND	<3.2	ND	<3.4	ND	<3.0	ND	<2.2	ND	<3.7	ND
Tributyltin	3.7		67		<3.2	ND	<2.8	ND	<3.0	ND	4.5		<2.0	ND	<3.3	ND
Dibutyltin	<2.4	ND	<7.2	ND	<2.8	ND	<2.5	ND	<2.6	ND	<2.3	ND	<1.7	ND	<2.8	ND
Monobutyltin	<38	ND	<110	ND	<48	ND,*	<39	ND,*	<42	ND,*	<36	ND	<27	cn	<45	ND,*
Total Metals (ICP) by USEPA Method 6010C (mg/Kg)																
Arsenic	5.2		3.6		6		5.4		5.7		5.4		2.6		8.2	
Barium	85		50		140		100		140		85		52		160	
Cadmium	0.30	J	0.22	J	1.2		0.64	J	0.83		0.64		0.16	J	1.2	
Chromium	23		14		32		30		32		33		13		57	
Lead	33		38		210		96		120		400		17		290	
Selenium	<3.7	ND	0.60	J	<4.1	ND	<3.3	ND	0.54	J	<2.4	ND	<1.8	ND	<3.8	ND
Silver	<1.8	ND	<1.6	ND	0.62	J	<1.7	ND	0.20	J	0.17	J	<0.90	ND	0.93	J
Total Mercury (CVAA) - SPLP East by USEPA Method 7471B (mg/Kg)																
Mercury	0.13	J	0.099	J	1.3		0.4		0.64		0.46		0.11	J	0.45	
General Chemistry																
Alkalinity (mg/L)	60		58		23		70		46		60		31		88	
Hardness (as CaCO3, mg/L)	72		85		50		86		68		66		36		110	
Moisture Content (%)	46.2		45.9		53.1		47.4		50.3		42.8		23.6		54.2	
Percent Solids (%)	53.8		54.1		46.9		52.6		49.7		57.2		76.4		45.8	
pH (s.u.)	6.8	^	7.36	^	7.7	^	7.25	^	6.82	^	6.98	^	7.67	^	7.01	^
Chloride, soluble (mg/Kg)	9.2	J	66		28		33		42		18		18		30	
Specific conductance (µmhos/cm)	210	B	230	B	190	B	240	B	210	B	190	B	140	B	300	B

Notes/Qualifiers:

J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value

B Compound was found in the blank and the sample

* LCS or LCSD is outside acceptance limits

cn Refer to Case Narrative for further details

ND Not detected at or below the method detection limit

^ Test performed in-house by Arcadis Treatability Laboratory

Table 5. Step 2 - Mix Recipes

Mix Number	Sediment Type (Scenario)	Mix Description	Sediment Wet Wt	Sediment Moisture (gravimetric)	Sediment Dry Wt	PC	PC	Calciment	Calciment	CKD	CKD
			g	%	g	%	g	%	g	%	g
Step 2 Mix-1	HB17-01	10% PC	500.0	45.12%	274.4	10%	27	0%	0	0%	0
Step 2 Mix-2		10% Calciment	500.0	45.12%	274.4	0%	0	10%	27	0%	0
Step 2 Mix-3		10% CKD	500.0	45.12%	274.4	0%	0	0%	0	10%	27
Step 2 Mix-4	HB17-02	10% PC	500.0	43.43%	282.9	10%	28	0%	0	0%	0
Step 2 Mix-5		10% Calciment	500.0	43.43%	282.9	0%	0	10%	28	0%	0
Step 2 Mix-6		10% CKD	500.0	43.43%	282.9	0%	0	0%	0	10%	28
Step 2 Mix-7	HB17-03	10% PC	500.0	53.72%	231.4	10%	23	0%	0	0%	0
Step 2 Mix-8		10% Calciment	500.0	53.72%	231.4	0%	0	10%	23	0%	0
Step 2 Mix-9		10% CKD	500.0	53.72%	231.4	0%	0	0%	0	10%	23
Step 2 Mix-10	HB17-04	10% PC	500.0	47.69%	261.5	10%	26	0%	0	0%	0
Step 2 Mix-11		10% Calciment	500.0	47.69%	261.5	0%	0	10%	26	0%	0
Step 2 Mix-12		10% CKD	500.0	47.69%	261.5	0%	0	0%	0	10%	26
Step 2 Mix-13	HB17-05	10% PC	500.0	51.02%	244.9	10%	24	0%	0	0%	0
Step 2 Mix-14		10% Calciment	500.0	51.02%	244.9	0%	0	10%	24	0%	0
Step 2 Mix-15		10% CKD	500.0	51.02%	244.9	0%	0	0%	0	10%	24
Step 2 Mix-16	HB17-06	10% PC	500.0	43.07%	284.6	10%	28	0%	0	0%	0
Step 2 Mix-17		10% Calciment	500.0	43.07%	284.6	0%	0	10%	28	0%	0
Step 2 Mix-18		10% CKD	500.0	43.07%	284.6	0%	0	0%	0	10%	28
Step 2 Mix-19	HB17-07	10% PC	500.0	23.43%	382.8	10%	38	0%	0	0%	0
Step 2 Mix-20		10% Calciment	500.0	23.43%	382.8	0%	0	10%	38	0%	0
Step 2 Mix-21		10% CKD	500.0	23.43%	382.8	0%	0	0%	0	10%	38
Step 2 Mix-22	HB17-08	10% PC	500.0	54.83%	225.9	10%	23	0%	0	0%	0
Step 2 Mix-23		10% Calciment	500.0	54.83%	225.9	0%	0	10%	23	0%	0
Step 2 Mix-24		10% CKD	500.0	54.83%	225.9	0%	0	0%	0	10%	23

Table 6. Step 2 - Performance Results

Mix Number	Sediment Type (Scenario)	Mix Description	1-HR Paint Filter Result (Pass/Fail)	24-Hour Shake Test (Free Water Released?)	Baseline Sediment Moisture (Gravimetric)	24-Hour Moisture Content	
						Gravimetric Moisture	Geotechnical Moisture
Step 2 Mix-1	HB17-01	10% PC	Pass	No	45.12%	42.06%	72.60%
Step 2 Mix-2		10% Calciment	Pass	Yes		41.80%	71.81%
Step 2 Mix-3		10% CKD	Pass	Yes		42.44%	73.73%
Step 2 Mix-4	HB17-02	10% PC	Pass	No	43.43%	39.85%	66.24%
Step 2 Mix-5		10% Calciment	Pass	No		40.78%	68.86%
Step 2 Mix-6		10% CKD	Pass	Yes		40.72%	68.70%
Step 2 Mix-7	HB17-03	10% PC	Pass	No	53.72%	50.57%	102.32%
Step 2 Mix-8		10% Calciment	Pass	Yes		49.34%	97.40%
Step 2 Mix-9		10% CKD	Pass	Yes		50.37%	101.49%
Step 2 Mix-10	HB17-04	10% PC	Pass	No	47.69%	42.19%	72.98%
Step 2 Mix-11		10% Calciment	Pass	No		43.74%	77.75%
Step 2 Mix-12		10% CKD	Pass	No		45.69%	84.14%
Step 2 Mix-13	HB17-05	10% PC	Pass	No	51.02%	47.70%	91.20%
Step 2 Mix-14		10% Calciment	Pass	No		47.41%	90.15%
Step 2 Mix-15		10% CKD	Pass	No		47.57%	90.75%
Step 2 Mix-16	HB17-06	10% PC	Pass	No	43.07%	39.69%	65.80%
Step 2 Mix-17		10% Calciment	Pass	No		39.34%	64.84%
Step 2 Mix-18		10% CKD	Pass	No		40.69%	68.61%
Step 2 Mix-19	HB17-07	10% PC	Pass	No	23.43%	21.03%	26.63%
Step 2 Mix-20		10% Calciment	Pass	No		19.71%	24.55%
Step 2 Mix-21		10% CKD	Pass	No		21.31%	27.09%
Step 2 Mix-22	HB17-08	10% PC	Pass	No	54.83%	50.09%	100.36%
Step 2 Mix-23		10% Calciment	Pass	Yes		50.17%	100.69%
Step 2 Mix-24		10% CKD	Pass	Yes		50.15%	100.60%

Table 7. Step 3 - Mix Recipes

Mix Number	Sediment Type (Scenario)	Mix Description	Sediment Wet Wt	Sediment Moisture (gravimetric)	Sediment Dry Wt	PC	PC	Calciment	Calciment	CKD	CKD
			g	%	g	%	g	%	g	%	g
Step 3 Mix-25	HB17-01	7.5% PC	500.0	45.12%	274.4	7.5%	21	0%	0	0%	0
Step 3 Mix-26		7.5% Calciment	500.0	45.12%	274.4	0%	0	7.5%	21	0%	0
Step 3 Mix-27		7.5% CKD	500.0	45.12%	274.4	0%	0	0%	0	7.5%	21
Step 3 Mix-28	HB17-02	7.5% PC	500.0	43.43%	282.9	7.5%	21	0%	0	0%	0
Step 3 Mix-29		7.5% Calciment	500.0	43.43%	282.9	0%	0	7.5%	21	0%	0
Step 3 Mix-30		7.5% CKD	500.0	43.43%	282.9	0%	0	0%	0	7.5%	21
Step 3 Mix-31	HB17-03	7.5% PC	500.0	53.72%	231.4	7.5%	17	0%	0	0%	0
Step 3 Mix-32		7.5% Calciment	500.0	53.72%	231.4	0%	0	7.5%	17	0%	0
Step 3 Mix-33		7.5% CKD	500.0	53.72%	231.4	0%	0	0%	0	7.5%	17
Step 3 Mix-34	HB17-04	7.5% PC	500.0	47.69%	261.5	7.5%	20	0%	0	0%	0
Step 3 Mix-35		7.5% Calciment	500.0	47.69%	261.5	0%	0	7.5%	20	0%	0
Step 3 Mix-36		7.5% CKD	500.0	47.69%	261.5	0%	0	0%	0	7.5%	20
Step 3 Mix-37	HB17-05	7.5% PC	500.0	51.02%	244.9	7.5%	18	0%	0	0%	0
Step 3 Mix-38		7.5% Calciment	500.0	51.02%	244.9	0%	0	7.5%	18	0%	0
Step 3 Mix-39		7.5% CKD	500.0	51.02%	244.9	0%	0	0%	0	7.5%	18
Step 3 Mix-40	HB17-06	7.5% PC	500.0	43.07%	284.6	7.5%	21	0%	0	0%	0
Step 3 Mix-41		7.5% Calciment	500.0	43.07%	284.6	0%	0	7.5%	21	0%	0
Step 3 Mix-42		7.5% CKD	500.0	43.07%	284.6	0%	0	0%	0	7.5%	21
Step 3 Mix-43	HB17-07	7.5% PC	500.0	23.43%	382.8	7.5%	29	0%	0	0%	0
Step 3 Mix-44		7.5% Calciment	500.0	23.43%	382.8	0%	0	7.5%	29	0%	0
Step 3 Mix-45		7.5% CKD	500.0	23.43%	382.8	0%	0	0%	0	7.5%	29
Step 3 Mix-46	HB17-08	7.5% PC	500.0	54.83%	225.9	7.5%	17	0%	0	0%	0
Step 3 Mix-47		7.5% Calciment	500.0	54.83%	225.9	0%	0	7.5%	17	0%	0
Step 3 Mix-48		7.5% CKD	500.0	54.83%	225.9	0%	0	0%	0	7.5%	17

Table 8. Step 3 - Performance Results

Mix Number	Sediment Type (Scenario)	Mix Description	1-HR Paint Filter Result (Pass/Fail)	24-Hour Shake Test (Free Water Released?)	Baseline Sediment Moisture (Gravimetric)	24-Hour Moisture Content	
						Gravimetric Moisture	Geotechnical Moisture
Step 3 Mix-25	HB17-01	7.5% PC	Pass	No	45.12%	42.52%	73.97%
Step 3 Mix-26		7.5% Calciment	Pass	No		41.84%	71.95%
Step 3 Mix-27		7.5% CKD	Pass	No		42.11%	72.74%
Step 3 Mix-28	HB17-02	7.5% PC	Pass	No	43.43%	41.48%	70.88%
Step 3 Mix-29		7.5% Calciment	Pass	No		41.04%	69.62%
Step 3 Mix-30		7.5% CKD	Pass	No		41.44%	70.77%
Step 3 Mix-31	HB17-03	7.5% PC	Pass	No	53.72%	50.87%	103.54%
Step 3 Mix-32		7.5% Calciment	Pass	No		50.07%	100.28%
Step 3 Mix-33		7.5% CKD	Pass	No		50.60%	102.42%
Step 3 Mix-34	HB17-04	7.5% PC	Pass	No	47.69%	45.32%	82.88%
Step 3 Mix-35		7.5% Calciment	Pass	No		44.73%	80.95%
Step 3 Mix-36		7.5% CKD	Pass	No		44.88%	81.42%
Step 3 Mix-37	HB17-05	7.5% PC	Pass	No	51.02%	47.82%	91.64%
Step 3 Mix-38		7.5% Calciment	Pass	No		47.31%	89.79%
Step 3 Mix-39		7.5% CKD	Pass	No		47.35%	89.95%
Step 3 Mix-40	HB17-06	7.5% PC	Pass	No	43.07%	40.43%	67.88%
Step 3 Mix-41		7.5% Calciment	Pass	No		40.48%	68.00%
Step 3 Mix-42		7.5% CKD	Pass	No		40.87%	69.12%
Step 3 Mix-43	HB17-07	7.5% PC	Pass	No	23.43%	21.64%	27.61%
Step 3 Mix-44		7.5% Calciment	Pass	No		21.19%	26.89%
Step 3 Mix-45		7.5% CKD	Pass	No		21.83%	27.92%
Step 3 Mix-46	HB17-08	7.5% PC	Pass	No	54.83%	52.07%	108.63%
Step 3 Mix-47		7.5% Calciment	Pass	No		51.44%	105.92%
Step 3 Mix-48		7.5% CKD	Pass	No		51.85%	107.70%

Table 9. Step 3 - Pocket Penetrometer Testing: Mix Recipes and Results

Mix Number	Sediment Type (Scenario)	Mix Description	Sediment Wet Wt	Sediment Moisture (gravimetric)	Sediment Dry Wt	PC	PC	Calciment	Calciment	Pocket Penetrometer Screening Results - tons per square foot (tsf)				
			g	%	g	%	g	%	g	Day 1	Day 4	Day 5	Day 6	Day 7
Step 3 Mix-1	HB17-08	10% PC	250.0	54.83%	112.9	10.0%	11.3	0%	0	0.25	0.5	0.5	0.5	0.5
Step 3 Mix-2		7.5% PC	250.0	54.83%	112.9	7.5%	8.5	0%	0	NR	0.25	0.25	0.25	0.25
Step 3 Mix-3		5% PC	250.0	54.83%	112.9	5.0%	5.6	0%	0	NR	NR	NR	NR	NR
Step 3 Mix-4		10% Calciment	250.0	54.83%	112.9	0%	0	10.0%	11.3	NR	NR	NR	NR	NR
Step 3 Mix-5		7.5% Calciment	250.0	54.83%	112.9	0%	0	7.5%	8.5	NR	NR	NR	NR	NR
Step 3 Mix-6		5% Calciment	250.0	54.83%	112.9	0%	0	5.0%	5.6	NR	NR	NR	NR	NR
Step 3 Mix-7		20% PC	250.0	54.83%	112.9	20.0%	22.6	0%	0.0	1.25	2.5	3.0	3.5	NP

NR = no reading obtained, mix too soft

NP = no reading performed, mold surface compromised

Table 10. Step 4 - Mix Recipes

Mix Number	Sediment Type (Scenario)	Mix Description	Sediment Wet Wt	Sediment Moisture (gravimetric)	Sediment Dry Wt	PC	PC
			g	%	g	%	g
Step 4 Mix-1	HB17-04	10% PC	10000.0	47.69%	5230.6	10%	523
Step 4 Mix-2	HB17-08	7.5% PC	10000.0	54.83%	4517.3	7.5%	339

Table 11. Step 4 - Analytical Results

Sediment Location:	HB17-04		HB17-04		HB17-08		HB17-08	
Sample Targets:	Highest TBT, high fines		Highest TBT, high fines		High Pb		High Pb	
Reagent Addition:	Untreated		10% Portland Cement		Untreated		7.5% Portland Cement	
DMU:	OC-17		OC-17		HS-3		HS-3	
Analyte	Result	Q	Result	Q	Result	Q	Result	Q
Leachable Semivolatile Organic Compounds (GC/MS) - SPLP East by USEPA Method 8270C (µg/L)								
Acenaphthene	<50	ND	< 1.8	ND	0.22	J	< 1.8	ND
Acenaphthylene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
Anthracene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
Benzo[a]anthracene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
Benzo[b]fluoranthene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
Benzo[k]fluoranthene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
Benzo[g,h,i]perylene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
Benzo[a]pyrene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
Chrysene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
Dibenz(a,h)anthracene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
Fluoranthene	0.10	J	< 1.8	ND	0.12	J	< 1.8	ND
Fluorene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
Indeno[1,2,3-cd]pyrene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
1-Methylnaphthalene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
Naphthalene	<50	ND	< 1.8	ND	<50	ND	< 1.8	ND
Phenanthrene	0.18	J	< 1.8	ND	0.20	J	< 1.8	ND
Pyrene	0.092	J	< 1.8	ND	0.07	J	< 1.8	ND
Leachable Organotins/GCMS - Organotins (GC/FPD) - SPLP East (µg/Kg)								
Tetrabutyltin	<0.052	ND	<0.054	ND	<0.052	ND	<0.050	ND
Tributyltin	<0.045	ND	<0.048	ND	<0.046	ND	<0.044	ND
Dibutyltin	<0.039	ND	<0.041	ND,*	<0.040	ND	<0.038	ND,*
Monobutyltin	<0.63	*cn	<0.66	ND,*cn	<0.63	*cn	<0.61	ND,*cn
Leachable Metals (ICP) - SPLP East by USEPA Method 6010B (mg/L)								
Arsenic	0.004	J	0.0041	J	<0.050	ND	0.0050	J
Barium	0.017	J	0.17	J B	0.031	J	0.077	J B
Cadmium	0.00033	JB	< 0.0050	ND	<0.050	ND	< 0.0050	ND
Chromium	0.0022	J	0.0041	J	0.00093	J	0.0066	
Lead	0.0021	J	< 0.010	ND	<0.050	ND	< 0.010	ND
Selenium	<0.050	ND	< 0.010	ND	<0.050	ND	< 0.010	ND
Silver	<0.050	ND	< 0.0050	ND	<0.050	ND	< 0.0050	ND
Thallium	<2.0	ND	< 0.020	ND	<2.0	ND	< 0.020	ND
Leachable Mercury (CVAA) - SPLP East by USEPA Method 7470A (mg/L)								
Mercury	<0.0020	ND	< 0.00020	U	<0.0020	ND	< 0.00020	
General Chemistry								
pH (s.u.)	7.25	^	12.3	H F	7.01	^	12.2	H F
Chloride (mg/L)	33		1.1		30		0.90	J
Hardness (as CaCO3, mg/L)	86		540		110		300	
Alkalinity (mg/L)	70	B	720		88	B	290	
Specific conductance (µmhos/cm)	240	B	1600	B	300	B	540	B

Notes/Qualifiers:

- J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value
- B Compound was found in the blank and the sample
- * LCS or LCSD is outside acceptance limits
- cn Refer to Case Narrative for further details
- ND Not detected
- H F Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
- NP Not performed
- ^ Test performed in-house by Arcadis Treatability Laboratory

Case Narrative:

Method(s) Organotins/GCMS: Monobutyltin has been identified as a poor performing analyte when analyzed using this method. The laboratory control limits are not based on historical performance and do not indicate expected performance of this analyte by this method. The laboratory does not use the performance of Monobutyltin as the basis for acceptance of the analytical batch. All analytical results, both detects and non-detects, are considered qualitative and are therefore flagged with a "cn" qualifier. The affected samples include: STEP 4 MIX-1 (240-85314-1), STEP 4 MIX-2 (240-85314-2), (LB 200-121609/1-B), (LCS 200-121609/2-B) and (LCSD 200-121609/3-B).

Table 12. Step 4 - Additional Performance Results

Mix Number	Sediment Type (Scenario)	Mix Description	1-HR Paint Filter Result (Pass/Fail)	24-Hour Shake Test (Free Water Released?)	pH (s.u.)
Step 3 Mix-25	HB17-08	7.5% Calciment	Pass	No	12.8
Step 3 Mix-26		5% Calciment	Pass	No	12.2
Step 3 Mix-27		4% Calciment	Pass	No	11.8

ATTACHMENT 1

Wisconsin Point Landfill Disposal Criteria Memo



Date: April 19, 2017

To: Chris Saari and John Morris

From: Joe Graham

Subject: Revisions to September 27, 2016 Memorandum with Subject Line, “Site-Specific Residual Contamination Levels for Dredge Material Proposed for Placement at the Closed Wisconsin Point Landfill in Superior, Wisconsin.

Purpose: The purpose of this memorandum is to revise the site-specific direct contact residual contamination levels (RCLs) for dredged material proposed to be used to improve the cover layer at the closed Wisconsin Point Landfill. Revised RCLs are warranted based on (i) public feedback on the proposal, (ii) EPA’s updated toxicity values for some chemicals (e.g. benzo[a]pyrene), (iii) WDHS’ recommendation to use the default exposure values on the U.S. EPA RSL website instead of NR 720 defaults when calculating RCLs, and (iv) publication DNR-RR-052e, “RR Program’s RCL Spreadsheet Update March 2017”. The contents of the September 27, 2016 memorandum are incorporated by reference except the following revisions are being made.

Approach for Proposed Soil Criteria:

Site-specific exposure parameters were used to determine RCLs generally following the procedures in ch. NR 720, Wis. Adm. Code, technical guide PUB-RR-890 (WDNR 2014), and the DNR publication titled *RR Program’s RCL Spreadsheet Update March 2017* (DNR-RR-052e). More specifically, U.S. EPA’s Regional Screening Level (RSL) web calculator for a recreational scenario was used (accessed April 17, 2017 at http://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search) along with the exposure factor inputs identified below.

Recreational Exposure Scenario for Wisconsin Point Landfill – Exposure Factor Inputs:

Age Segment (yr)	Adherence Factor (AF) (mg/cm ²)	Body Weight (BW) (kg)	Exposure Duration (ED) (yr)	Exposure Frequency* (EF) (day/yr)	Exposure Time* (ET) (hr/event)	Intake Rate (IRS) (mg/day)	Skin Surface Area (SA) (cm ² /day)
0 - 2	0.2	15	2	<i>90</i>	<i>4</i>	200	<i>2,373</i>
2 - 6	0.2	15	4	<i>90</i>	<i>4</i>	200	<i>2,373</i>
6 - 16	0.07	<i>80</i>	10	<i>90</i>	<i>4</i>	100	<i>6,032</i>
16 - 30	0.07	<i>80</i>	<i>10</i>	<i>90</i>	<i>4</i>	100	<i>6,032</i>

Notes: Default values from EPA Calculator, for recreational exposures, except values for Exposure Frequency and Exposure Time which are explained below. Additional input assumptions include a vegetative cover fraction of 0.9, exposure area of 23.1 acres, and climatic conditions for Minneapolis, MN. Changes from the September 27, 2016 memo are indicated with *red italicized text*.

Explanation of Site-Specific Exposure Factor Inputs:

Exposure Frequency: The estimated exposure frequency was increased from 20 to 90 days per year based on public interest in recreational uses beyond those identified in the Wisconsin Point Management plan. The exposure frequency of 90 days per year represents 3 visits to the site per week and assumes the site is not frozen or snow covered 30 weeks per year. Small children are assumed to have the same exposure as adults even though they are more likely to be pushed in strollers or carried by adults. The exposure frequency of 90 days per year is believed to be conservative for the closed landfill given that there are more appealing locations for recreation nearby on Wisconsin Point (e.g. beach access points, etc.).

Exposure Time: The estimated exposure time was increased from 1 to 4 hours in consideration that benches and open-sided shelters may be constructed on the placed material. This exposure time is conservative in the level of protection for direct contact based on expected uses of the site.

Proposed Placement Criteria for the Wisconsin Point Landfill:

The following criteria are proposed for placement of Howards Bay dredge material at the Wisconsin Point Landfill:

- 1) Material from dredge management units in which the average value for each contaminant does not exceed the Placement Criteria values in Table 1 (April 18, 2017 revision) is acceptable for surface cover soil at the Wisconsin Point Landfill. Efforts shall be made, to the maximum extent practicable, to place materials from dredge management units with the lowest concentrations higher in the surface cover profile.
- 2) Material from dredge management units in which the average value of each contaminant does not exceed **five** times the Placement Criteria values in Table 1 (April 18, 2017 revision) is acceptable for subsurface placement at the Wisconsin Point Landfill, provided it is overlain by a minimum of 24 inches of soil or dredged material meeting the Placement Criteria in Table 1 (April 18, 2017 revision). Efforts shall be made, to the maximum extent practicable, to place materials from dredge management units with the highest concentrations first, and then place material from dredge prisms with lesser concentrations in successive lifts on top of that first lift.
- 3) Material from dredge management units in which the average value of any contaminant exceeds **five** times the Placement Criteria values in Table 1 (April 18, 2017 revision) is not acceptable for placement at the Wisconsin Point Landfill.
- 4) In accordance with ch. NR 720, Wis. Admin. Code, the cumulative excess cancer risk shall not exceed 1×10^{-5} and the hazard index for non-carcinogens shall not exceed one in the surface cover layer.

Table 1 (April 18, 2017 Revision): Recommended Wisconsin Point Landfill Placement Criteria in mg/kg

Chemical	CAS Number	EPA Calculator Site-Specific Screening Level (90 days – 4hrs.)	Basis	NI DC (March 2017)	IND DC (March 2017)	Dataset Max	Criteria Basis	Placement Criteria
Lead and Compounds	7439-92-1	400	nc	400	800	2,700	NI DC	400
Mercury (elemental)	7439-97-6	3.13	Ssat	3.13	3.13	9	NI DC	3.13
Acenaphthene	83-32-9	13,900	nc	3,590	45,200	1.9	NI DC	3,590
Acenaphthylene	208-96-8	--	--	--	--	0.36	--	--
Anthracene	120-12-7	69,700	nc	17,900	100,000	3.3	NI DC	17,900
Benz[a]anthracene	56-55-3	4.44	ca	1.14	20.8	6.3	Site-Specific	4.44
Benzo(j)fluoranthene	205-82-3	1.65	ca	0.424	1.76		Site-Specific	1.65
Benzo[a]pyrene	50-32-8	0.447	ca	0.115	2.11	5.3	Site-Specific	0.447
Benzo[b]fluoranthene	205-99-2	4.47	ca	1.15	21.1	7.8	Site-Specific	4.47
Benzo[g,h,i]perylene	191-24-2	--	--	--	--	2.7	--	--
Benzo[k]fluoranthene	207-08-9	44.7	ca	11.5	211	2.8	NI DC	11.5
Chrysene	218-01-9	447	ca	115	2,110	6.7	NI DC	115
Dibenz[a,h]anthracene	53-70-3	0.447	ca	0.115	2.11	0.64	Site-Specific	0.447
Fluoranthene	206-44-0	9,300	nc	2,390	30,100	9.1	NI DC	2,390
Fluorene	86-73-7	9,300	nc	2,390	30,100	2	NI DC	2,390
Indeno[1,2,3-cd]pyrene	193-39-5	4.47	ca	1.15	21.1	2.5	Site-Specific	4.47
Methylnaphthalene, 1-	90-12-0	68.3	ca	17.6	72.7	0.42	NI DC	17.6
Methylnaphthalene, 2-	91-57-6	930	nc	239	3,010	1.2	NI DC	239
Naphthalene	91-20-3	47.6	ca*	5.52	24.1	4.3	NI DC	5.52
Perylene	198-55-0	--	--	--	--	0.66	--	--
Phenanthrene	85-01-8	--	--	--	--	9.8	--	--
Pyrene	129-00-0	6,970	nc	1,790	22,600	9	NI DC	1,790
Thallium (Soluble Salts)	7440-28-0	3.04	nc	0.782	10.2	5.9	Site-Specific	3.04
Tributyltin Compounds	NA	73.7	nc	--	--	13	Site-Specific	73.7

All values in milligrams per kilogram (mg/Kg)

-- = Value not available

Dataset Max = maximum value of that compound contained in comprehensive project sampling database

Abbreviations for *Basis* as follows: non-carcinogen (nc), carcinogen (ca), soil saturation level (Ssat), ceiling level (max)

NI DC = non-industrial direct contact RCL from DNR web calculator spreadsheet (350 days – 24 hrs.)

IND DC = industrial direct contact from DNR web calculator spreadsheet (250 days – 8 hrs.)

ATTACHMENT 2

Summary of 2017 Howards Bay Sediment
Sampling and Contract Laboratory Results



DATE: July 20, 2017 FILE REF: Howard Bay

TO: Howards Bay Project Team (Design Team and Partners)

FROM: Joe Graham, WDNR

SUBJECT: Summary of 2017 Howards Bay Sediment Sampling and Contract Laboratory Results

The purpose of this memo is to summarize the 2017 sediment investigation efforts in Howards Bay and provide results from the WDNR contract laboratory. A preliminary assessment of how the results may affect dredge cut lines and disposal determinations is also included along with other observations.

OVERVIEW

Sediment samples were collected in Howards Bay by USEPA and WDNR from the R/V Mudpuppy II June 19 through 22, 2017. Bill Murray was the lead EPA scientist. Joe Graham of WDNR determined sampling intervals, labeled sample bottles and coordinated with the laboratory. The sampling vessel was operated by Captain Joe Bonem and crew from Cetacean Marine who also collected and processed samples. Water depth was measured using a sounding lead and used along with water level readings from the NOAA gauge at the USACE vessel yard to determine the sediment surface elevation and sample intervals. Samples were collected using a vibracore and four-inch diameter polycarbonate tubes from all but one location where a surface grab was taken. Over the three and a half day mobilization samples were collected at 31 of the 38 planned locations identified in the QAPP. Sediment was collected and processed or packaged for multiple objectives including USACE treatability testing, WDNR samples to fill data gaps for disposal determinations, WDNR samples to confirm the cut depth for dredge prisms, and samples for stable mercury isotope analysis by USEPA & USGS researchers.

Sample coordinates and field data are in Tables 1 & 2. Analytical results for bulk sediment are summarized in Tables 3a and 3b. Results of SPLP and TCLP analyses are in tables 4 and 5, respectively. The original laboratory reports and electronic data deliverable (EDD) files will be sent to the project team in a separate e-mail. Table 6 contains recommendations for changes to dredge cut elevations at the locations sampled.



SUMMARY OF FIELD EFFORTS

Deviations from the QAPP: Sample collection and processing was done according to the project QAPP with a few minor deviations. First, cores were not attempted to refusal at all locations. Instead attempts were made to achieve the target depths for sampling intervals in an effort to speed processing and save longer core tubes for where they were needed. Second, samples collected for disposal data gaps or confirming dredge prisms were mixed by hand instead of using a drill and mixing paddle. And finally samples for stable isotope analysis were capped and picked up at the dock by the USEPA Duluth lab. As a result WDNR was not able to subsample these same cores for total mercury as intended.

All locations sampled were within the footprint of the planned dredge management unit (DMU) except location HB17-12 where the sample vessel experienced satellite geometry issues near the bridge. As a result location HB17-12 is about 4 feet beyond the dredge contour limits for unit FC-14, though results from this location are close enough that they can be considered representative of material to be removed from proximal areas in in FC-14.

Abandoned Locations: Seven of the 38 planned locations were not sampled for several reasons. Two locations (HB17-13 & 15) were not collected since one core was successfully obtained from another location in the same dredge management unit (DMU). A field call was made to only attempt a second core in these DMUs (FC-15 & FC-16) if there was time after attempting all other locations. Locations HB17-27 and 28 were abandoned due to their close proximity to treatability sample locations. Locations HB17-32, 33, and 34 were not sampled due to wind conditions on the last day and expiration of time for mobilization.

USACE Treatability Samples: Sediment was collected from 8 locations (HB17-01 to HB17-08) for bench testing by USACE contractors to evaluate geotechnical characteristics and evaluate stabilization additives. Two five-gallon buckets were filled at each location by taking multiple cores, or grabs in the case of HB17-01, until sufficient volume was obtained. Details on core penetration and sediment recovery for each attempt were recorded in separate field logs by Murray and Graham. Samples were not mixed in the field. Buckets were labeled and the lids were attached. Graham maintained custody of the buckets after each day of sampling. Graham delivered the buckets to Al Mozol at the USACE vessel yard in Duluth, MN in the mornings of June 20 and 21, 2017. Mozol shipped the buckets to the contract lab via UPS Freight. Chemistry samples were also collected to fill disposal gaps and/or to confirm dredge prism at all the treatability sample locations except two. Chemistry was not sampled at HB17-01 since

this is a tributyltin DMU (OC-17) or at HB17-05 (FP-2) which missed reaching the dredge cut elevation by 3.5 inches. Analytical results are summarized in Table 3.

Disposal Gaps and Dredge Cut Confirmation: Samples were collected for analysis from 26 locations spread across 21 DMUs. A total of 50 samples were collected and analyzed to aid disposal determinations and/or confirm dredge cut elevations. Samples to confirm the dredge prism were generally collected where at least 1 foot of sediment was recovered below the elevation of the cut line. Photographs of native red clay material from the bottom of core HB17-17 are attached. Native red clay intervals were excluded from sampling. For the disposal gaps 18 samples were collected for Polycyclic Aromatic Hydrocarbons (PAHs) and Total Organic Carbon (TOC) from intervals representative of the material to be dredged (i.e. above the cut elevation). In addition, 5 samples were taken for VOCs, 8 samples for SPLP extraction and 4 samples for TCLP extraction. SPLP and TCLP extractions were analyzed for RCRA metals and PAHs. Thallium was only reported above detection levels in one of thirteen samples with a maximum detection of 0.83 mg/kg. Lead and mercury samples were collected for both disposal gaps and to confirm dredge prisms. A total of 45 samples were analyzed for lead with a maximum detection of 333 mg/kg in unit FS-1. Thirty-eight samples were analyzed for mercury with a maximum detection of 1.7 mg/kg in unit CS-1. Detailed analytical results are presented in Table 3 and a preliminary assessment of the results is provided below.

Stable Mercury Isotope Samples: A total of four cores were collected for stable mercury isotope profiles. One core was taken from Hughitt Slip at location HB17-38 (HS-1). In Cummings Slip two cores were collected at HB17-36 (CS-1) and one core at HB17-37 (CS-2). Cores were advanced to refusal capped, taped, and labeled. All four cores were handed off to Greg Peterson of the EPA Duluth Lab at 12:25 PM on June 22, 2017 when the Mudpuppy docked for lunch. Additional core caps were later picked up by the EPA lab for segmenting the cores being shared with USGS researchers.

PRELIMINARY ASSESSMENT OF RESULTS

Data Gaps for Disposal: A preliminary screening of results was done by comparing analytical results to the proposed placement criteria for the Wisconsin Point landfill (see April 19, 2017 WDNR memorandum). A total of 45 samples were analyzed for lead with detections ranging from 2 to 333 mg/kg. No lead results exceeded the 400 mg/kg placement criteria for Wisconsin Point. Thirty-eight samples were analyzed for mercury with a maximum detection of 1.7 mg/kg which is below the placement criteria of 3.13 mg/kg. The maximum detection of thallium of 0.83 mg/kg is well below the

placement criteria of 3.04 mg/kg. The results for lead, mercury, and thallium suggest that concentrations of these metals at the locations and depth intervals sampled are suitable for placement in the surface cover layer at the Wisconsin Point Landfill.

A total of 18 samples were analyzed for TOC and PAHs with quantification of 18 individual PAH compounds. TOC levels ranged from 1.25 to 16.8 percent. Total PAH levels (sum of 18 compounds) ranged from 1,105 to 57,311 ug/kg with the maximum detection being found in sample HB17-21(0-20) located in unit FS-1. Benzo(a)pyrene (BaP) levels exceed the criteria for surface placement in samples from units CS-1, CS-2, CS-5, FS-1, and HS-1. The surface placement criteria for Benzo(b)fluoranthene and Dibenzo(a,h)anthracene were also exceeded at location HB17-20 in unit FS-1. The criteria for surface placement for all other PAH compounds was met at all other locations and intervals sampled. The acceptance criteria of 5 times the surface criteria was exceeded for BaP in sample HB17-21 (0-20) and its duplicate HB17-21(0-20)DUP from unit FS-1. This indicates that material from location HB17-21 is not suitable for placement at the Wisconsin Point landfill.

The results from SPLP and TCLP analyses show that levels of arsenic, barium, cadmium, chromium, selenium, silver, lead, mercury, and PAHs leached from the material tested are negligible with levels reported below Wisconsin groundwater quality standards and the thresholds for hazardous waste characteristics.

WDNR recommends that the design team revisit the placement criteria evaluation to incorporate data from this study into unit averages and determinations for material placement/disposal. Consideration should be given to subdividing DMUs where practical to segregate areas that may not meet Wisconsin Point placement criteria (i.e. surface or burial layers). The revised evaluations should be distributed to the project team for review and comment prior to the next design submittal package. In addition, WDNR recommends that the contents of treatability bucket HB17-02 be analyzed for total mercury since this sample is representative of the depth interval where the extraordinary detection of 58 mg/kg mercury was found in sample HB 10-1-16 (12-31) from the 2010 study. These data will help determine if the 58 mg/kg result is an outlier and if some, if not all, of the material in unit HS-3 is suitable for surface placement at the Wisconsin Point landfill.

Dredge Prisms: Analytical results for all sample intervals were compared to the cleanup goals for lead (83 mg/kg) and mercury (0.64 mg/kg). It should be noted that samples were not collected for tributyltin (TBT) during this study and dredge prisms cannot be confirmed or refined for units where this parameter

is driving remediation. The elevation of contamination was calculated by subtracting the bottom depth of the lowest interval in a core that exceeded cleanup goals from the sediment surface elevation. The depth of the proposed dredge prism was determined using the elevations for planned locations provided by the design team or interpolated where necessary using the shape files of the dredge contours provided with the 65% design plans. The difference in elevation between the contaminated intervals and the proposed dredge cut were used along with the presence of red clay to make recommendations for revisions to the dredge cut elevation for each location sampled.

WDNR's recommendations and suggested cut elevations for dredge prisms in the vicinity of the locations sampled are in Table 6. These changes are recommended on a location-by-location basis and not necessarily intended to extend over an entire DMU, unless warranted. Of the 28 locations where data was collected changes are recommended in 12 locations (7 deeper and 5 shallower). These suggested changes are based on confirmation of contamination levels and we request that the design team consider these when making revisions to the dredge prisms for calculating dredge volumes. The revised dredge prisms and a table summarizing changes in dredge volumes should be distributed to the project team for review and comment prior to the next design submittal package.

OTHER OBSERVATIONS

Core samples were collected from location HB17-07 for treatability testing by the USACE contractor. This location is adjacent to the steel sheet pile (SSP) wall that was installed in 2016 after the filling of the Baxter Avenue slip and embayment. The measured water depth at location HB17-07 was 14.6 feet, relative to the low water datum (LWD) for Lake Superior of 601.1 feet (IGLD85). Based on this depth measurement and water level the sediment surface elevation at HB17-07 is calculated to be 586.5 feet. A total of 5 cores were collected for treatability testing at HB17-07 using 5 foot core tubes to the target depth (i.e. not to refusal). Refusal was not obtained in any of the 5 cores and sediment recovery ranged from 31 to 46 inches. All 5 treatability cores contained a layer of sand approximately 3 feet thick on top of silty clay. A sixth core was collected from this location for chemistry using an 8 foot long core tube (no refusal) and recovered 58 inches of sediment. The top 36 inches of this core was pure sand with little to no fines. The material below the sand from 36 to 58 inches transitioned from a soft silty-clay to dense brown clay at the bottom. Photographs showing the sediment profile at HB17-07 are attached.

Location HB17-07 is within thirteen feet of the targeted sample location, which was selected to reaffirm conditions found at location HB13-25 during 2013 sampling efforts. A copy of the boring log from

HB13-25 is attached. The top layer of sediment at HB13-25 was described in the log as 0 to 36 inches of silt with little sand, grey brown, poorly sorted, medium plasticity, very soft, wet. Photographs of the core sample from HB13-25 are attached. The calculated sediment surface elevation at location HB13-25 was 584.73 feet and the water depth relative to LWD was 16.37 feet (WDNR 2013 Field Report, March 2014). The sediment surface elevation increased between 2013 and 2017 by about 1.8 feet.

The presence of several feet of sand over soft silty material in the 2017 core samples and measured increase in the sediment surface elevation indicates that deposition of sand occurred in this area sometime between the 2013 and 2017 measurements. There is minimal unidirectional flow in Howards Bay and upstream sources of sediment are not expected to be significant at this location along the SSP wall. The majority of fill material in the Baxter Avenue slip and embayment consisted of sand and was placed prior to the installation of the SSP wall. Given the absence of upstream sediment sources and that the Baxter slip and embayment was largely filled before the SSP wall was installed, it is most likely that the sand found in the top layer of sediment at HB17-07 is fugitive material from the discharge of fill into the embayment.

LIST OF ATTACHMENTS

- Tables
- Figures
- Photos
- Map, core log, and photographs Referenced in other observations section
- Laboratory Reports
- Quality Assurance Project Plan (QAPP)

TABLES

Table 1: Coordinates and Field Notes for 2017 Howards Bay Sediment Sampling Locations

Location	Unit	Latitude (DD)	Longitude (DD)	Notes
HB17-04	HS-1	46.73819535	-92.09920277	Treatability sample from cores 1 & 2 of 3 (2, 5-gallon buckets). Chemistry samples from core 3 of 3, Pb & Hg. Brown clayey silt, sheen on water when tube pulled.
HB17-02	HS-3	46.74072702	-92.09902402	Treatability sample composited from 9 of 9 cores. Chemistry from core 9, Pb & Hg. Core tube tipped on core 9, depth of penetration undetermined.
HB17-03	CS-4	46.73915858	-92.09635503	Treatability sample from 7 of 7 cores. Odor in core 2 and 4. Chemistry from core 1, Pb & Hg. This location not attempted to refusal.
HB17-06	FC-2	46.73623177	-92.08778007	Treatability sample from 4 of 5 core attempts . Attempt 4 of 5 washed out - no sediment recovery. Dense red clay at bottom of cores 1, 2, & 3. Red clay discarded from core 2 & 3. Chemistry @ 18:30 from Core 2 (53-60), 5-inches of red clay at bottom not included in chemistry sample (60 -65) Pb & Hg.
HB17-01	OC-17	46.74202735	-92.09887555	Water depth at original location below cut line, moved up slope to 576' line - area with steeper slope. Grab samples taken instead of cores. Treatability sample composite of 11 grabs. No chemistry this location.
HB17-07	OC-11	46.73923552	-92.09382174	Treatability sample from 5 of 5 cores. No refusal at 5 feet. Next to Baxter dock wall. About 2 feet more sediment here than 2013 bathymetry. Top layer (about 3 ft.) is sand and bottom (12") is silty clay. Chemistry from (46-58) Pb & Hg.
HB17-08	FS-1	46.73662536	-92.09087463	Treatability sample from 10 of 10 cores, kept material above depth of 31". Chemistry from core 1 of 10, Pb & Hg.
HB17-05	FP-2	46.73466651	-92.08560797	Treatability sample from 6 of 6 cores. Oil sheen on core 4. No chemistry this location.
HB17-12	FC-14	46.74194942	-92.09837677	Satellite geometry issues near bridge. Chemistry PAH & TOC.
HB17-14	FC-15	46.74248446	-92.09896438	Soft brown silty clay w/sand. Chemistry PAH & TOC.
HB17-16	FC-16	46.74278768	-92.09881101	Top soft wet silt w/sand, bottom medium grey brown clay. Chemistry PAH & TOC.
HB17-20	OC-16	46.74304732	-92.09834149	Chemistry PAH, TOC, SPLP metals & PAHs
HB17-19	OC-12	46.73987363	-92.09339262	Soft brown silty clay w/sand. Chemistry dredge cut (0-42) PAH, TOC, Pb, Hg, & Th. Lead (42-54), (54-66), (66-78), (78-90), (90-102), (102-104)
HB17-17	OC-3	46.73572898	-92.08630865	Soft brown silty clay, 10-inch dense red clay plug at bottom (16-26). Photos of taken before and after splitting open red clay plug. Chemistry PAH, TOC, Pb, Th, Hg
HB17-10	FC-1	46.73548656	-92.08665908	Top 0 to 44 inches not sampled (SND material 577.21 to 573.6 ft MSL). Chemistry sample 44-86" (573.6 to 570.3), brown silty clay w/sand and oily odor. PAH, TOC, Pb, Hg, Th, SPLP metals & PAHs
HB17-11	FC-3	46.73656813	-92.08829658	Top 0 - 17 inches not sampled (SND material 575.01 to 573.6 ft MSL). Chemistry sample 17 - 51" (573.6 to 570.76). Silty clay w/ fine sand, oily-diesel smell. Dense fine sand at bottom.

Table 1: Coordinates and Field Notes for 2017 Howards Bay Sediment Sampling Locations

Location	Unit	Latitude (DD)	Longitude (DD)	Notes
HB17-18	OC-7	46.73665211	-92.08911212	Location close to wall making it difficult to anchor. Offset 35 ft. to midpoint of 582' depth. Core split lengthwise. Samples collected (0-12) PAH, TOC, Pb, Hg, Th, soft brown silt, (12-24) Pb, medium silty clay, (24-47) discarded dense sand at bottom of catcher.
HB17-23	FS-1	46.73706225	-92.09048837	Very soft silt w/clay, visible sheen and oil odor, bottom 5" is red clay. Sample (0-30) PAH, TOC, Pb, Hg, Th, SPLP. (30-35) not sampled-dense native red clay
HB17-38	HS-1	46.73796338	-92.09898675	Core collected and for pick up by EPA Duluth lab for mercury isotope analysis.
HB17-28	HS-1	46.73844312	-92.09915832	Top 0 - 63 inches sampled for PAH and TOC, dredge cut 587.2 to 581.95. Black-grey silty clay. All other intervals sampled for Pb & Hg. Slag at 84". Dense fine sand 84 - 115. Bottom 99-115" not sampled.
HB17-36	CS-1	46.7379371	-92.09608213	Boat tied at planned location, off-set to south. Oil sheen observed when positioning boat and on core 2 of 2. Collected 2 cores for pick up by EPA Duluth lab for mercury isotope analysis.
HB17-37	CS-2	46.738282	-92.09630448	Core collected and for pick up by EPA Duluth lab for mercury isotope analysis.
HB17-09	CS-5	46.73973642	-92.09602965	Chemistry (0-30) dredge cut plus 6 inches (587.7 to 585.2): PAH, TOC, Pb, Hg, Th. Duplicate sample collected same parameters.
HB17-24	CS-1	46.73806611	-92.0961488	Chemistry dredge cut (0-80) PAH, TOC, Pb, Hg, Th, SPLP, TCLP, VOCs
HB17-25	CS-2	46.73851609	-92.09620687	Chemistry dredge cut (0-30) PAH, TOC, Pb, Hg, Th, SPLP, TCLP, VOCs. Soft dark grey silty clay with red clay smears outside tube.
HB17-21	FS-1	46.73627144	-92.09131455	0 to 20 soft dark grey silty clay with sand, 20 - 37 dense red clay. Bottom 17" is dense red clay plug. Sample (0-20) PAH, TOC, Pb, Hg, Th, SPLP, TCLP, VOC. Duplicate (0-20) PAH, TOC, Pb, Hg, Th, VOC
HB17-22	FS-1	46.73678161	-92.09082058	Dredge cut (0 -33) soft grey silty clay ,sampled for PAH, TOC, VOC, Pb, Hg, Th. All other intervals samples for Pb & HG. (33-45) grey silty clay with little sand, (45-58) light grey brown silty clay.
HB17-35	OC-8	46.73720657	-92.09028572	Brown silty clay with red clay nodules, red clay at bottom of tube. Sample collected 0 to 17 inches, Pb & Hg
HB17-26	FP-2	46.73496875	-92.08591276	All material recovered from 2 - 50 inches is below dredge cut of 585'. All intervals sampled for Pb & Hg. (0-12) silty clay, (12-24) silty clay with sand and gravel, (24-36) soft brown clay w/wood, (36-50) red brown clay, medium dense. Duplicate sample collected from (0-12) for Pb & Hg.
HB17-31	FP-2	46.73439873	-92.08549379	Dredge cut top 28 inches (584.5'). All intervals sampled fro Pb & Hg. (0-28) soft silty clay w/sand and woody fibers, (28-40) silty sand w/coarse sand, (40-50) silty sand transitioning to fine sand
HB17-30	FP-2	46.73543953	-92.08612201	Core tube tipped during vibracore. Not reattempted due to increasing wind and scow being moved by Fraser tug. Core is 26 inches above dredge elevation. Brown silty clay w/sand. Sample collected (0-22) for Pb & Hg.

Table 2: Sample Collection Data

Location	RD Unit ID	Date Collected	Time	NOAA Gauge (ftMSL)	Water Depth (ft)	Sediment Surface Elevation	Penetration (ft)	Sediment Recovered (in)	Sediment Recovered (ft)	Percent Recovery	Core Tube Length (ft)	Chemistry Sample Interval(s)
HB17-04	HS-1	06/19/2017	13:30	602.835	14.92	587.92	8.5	92	7.67	90%	10	(72 - 84), (84 - 92)
HB17-02	HS-3	06/19/2017	16:00	602.756	21.92	580.84	Unknown	11	0.92	NA	5	(0 - 11)
HB17-03	CS-4	06/19/2017	16:40	602.894	8.58	594.31	4.5	49	4.08	91%	5	(36 - 49)
HB17-06	FC-2	06/19/2017	18:11	602.969	28.5	574.47	6.5	65	5.42	83%	10	(53 - 60)
HB17-01	OC-17	06/20/2017	9:45	602.956	25.75	577.21	0.333	4	0.33	100%	GRAB	NA
HB17-07	OC-11	06/20/2017	11:40	602.92	16.42	586.5	8	58	4.83	60%	8	(46 - 58)
HB17-08	FS-1	06/20/2017	14:25	602.851	13.75	589.1	4.25	41	3.42	80%	5	(24 - 36), (36 - 41)
HB17-05	FP-2	06/20/2017	16:20	603.012	17.25	585.76	5	48	4.00	80%		NA
HB17-12	FC-14	06/21/2017	8:27	602.927	29.17	573.76	4	41	3.42	85%	5	(0 - 31)
HB17-14	FC-15	06/21/2017	9:10	602.923	29.42	573.5	5	51	4.25	85%	5	(0 - 26)
HB17-16	FC-16	06/21/2017	9:40	602.972	30.08	572.89	6	63	5.25	88%	10	(0 - 63)
HB17-20	OC-16	06/21/2017	10:45	603.077	10.33	592.75	3.5	37	3.08	88%	5	(0 - 16)
HB17-19	OC-12	06/21/2017	11:30	602.927	24	578.93	10	112	9.33	93%	10	(0 - 42), (42 - 54), (54 - 66), (66 - 78), (78 - 90), (90 - 102), (102 - 104)
HB17-17	OC-3	06/21/2017	14:10	603.068	18.58	584.49	2.75	26	2.17	79%	5	(0 - 16)
HB17-10	FC-1	06/21/2017	14:45	603.123	25.92	577.2	7	86	7.17	102%	10	(44 - 86)
HB17-11	FC-3	06/21/2017	15:30	603.179	28.17	575.01	5	51	4.25	85%	10	(17 - 51)
HB17-18	OC-7	06/21/2017	16:30	603.182	21.67	581.51	4.25	47	3.92	92%	5	(0 - 12), (12-24)
HB17-23	FS-1	06/21/2017	17:30	603.245	13.75	589.5	4	35	2.92	73%	10	(0 - 30)
HB17-38	HS-1	06/22/2017	8:10	603.084	11.33	591.75	5	45	3.75	75%	10	USGS-EPA

Table 2: Sample Collection Data

Location	RD Unit ID	Date Collected	Time	NOAA Gauge (ftMSL)	Water Depth (ft)	Sediment Surface Elevation	Penetration (ft)	Sediment Recovered (in)	Sediment Recovered (ft)	Percent Recovery	Core Tube Length (ft)	Chemistry Sample Interval(s)
HB17-28	HS-1	06/22/2017	8:45	602.946	15.75	587.2	9.5	115	9.58	101%	10	63), (63 - 75), (75 - 87), (87 - 99)
HB17-36	CS-1	06/22/2017	10:30	602.815	9.58	593.24	6	72	6.00	100%	10	USGS-EPA
HB17-37	CS-2	06/22/2017	11:15	602.7	10.17	592.53	5	61	5.08	102%	10	USGS-EPA
HB17-09	CS-5	06/22/2017	11:50	602.779	15.08	587.7	3	30	2.50	83%	5	(0 - 30) & (0 - 30) DUP
HB17-24	CS-1	06/22/2017	14:35	603.232	10.5	592.73	7.5	80	6.67	89%	10	(0 - 80)
HB17-25	CS-2	06/22/2017	15:20	603.255	13.5	589.76	3	30	2.50	83%	10	(0-30)
HB17-21	FS-1	06/22/2017	16:20	603.136	12.5	590.64	4.5	37	3.08	69%	5	(0 - 20) & (0 - 20) DUP
HB17-22	FS-1	06/22/2017	17:10	603.045	12.83	590.22	5	58	4.83	97%	5	(0 - 33), (33 - 45), (45 - 58)
HB17-35	OC-8	06/23/2017	8:10	603.028	18.75	584.28	1.5	17	1.42	94%	5	(0 - 17)
HB17-26	FP-2	06/23/2017	8:49	602.74	17.58	585.16	5	50	4.17	83%	5	(0 - 12), (12 - 24), (24 - 36), (36 - 50)
HB17-31	FP-2	06/23/2017	9:45	602.69	15.92	586.77	5	50	4.17	83%	5	(0 - 28), (28 - 40), (40 - 50)
HB17-30	FP-2	06/23/2017	10:48	602.526	13.08	589.45	2.5	22	1.83	73%	10	(0 - 22)

Table 3a: Bulk Sediment Analytical Results (excluding VOCs)

Parameters	DMU	CS-1	CS-2	CS-4	CS-5	CS-5	FC-1	FC-14	FC-15	FC-16	FC-2	FC-3	FP-2	FP-2	FP-2	FP-2	FP-2
	Location Depth Interval (in) Units/Date	HB17-24 0-80 06/22/2017	HB17-25 0-30 06/22/2017	HB17-03 36-49 06/19/2017	HB17-09 0-30 06/22/2017	HB17-09DUP 0-30 06/22/2017	HB17-10 44-86 06/21/2017	HB17-12 0-31 06/21/2017	HB17-14 0-26 06/21/2017	HB17-16 0-63 06/21/2017	HB17-06 53-60 06/19/2017	HB17-11 17-51 06/21/2017	HB17-26 0-12 06/23/2017	HB17-26 DUP 0-12 06/23/2017	HB17-26 12-24 06/23/2017	HB17-26 24-36 06/23/2017	HB17-26 36-50 06/23/2017
Percent Solids	%	38.9	49.4	29.4	54.4	49.5	65.5	51.4	64.2	66.8	64.4	56.7	55.2	55.8	62.4	54.7	46.6
Total Organic Carbon	mg/kg	168,000	65,100		33,600	32,400	22,400	28,600	19,600	16,900		14,600					
Metals																	
Lead	mg/kg	302	225	52.8	95.6	109	175				96.8	90.6	130	121	104	90.3	80.6
Thallium	mg/kg	<0.84	<0.67		<0.64	<0.53	<0.44					<0.59					
Mercury	mg/kg	1.7	0.86	0.1	0.52	0.41	0.4				0.61	0.44	1.1	0.69	0.55	0.2	0.13
PAHs																	
1-Methylnaphthalene	ug/kg	1,160	307		225	534	260	87	53	19		265					
2-Methylnaphthalene	ug/kg	1,750	449		347	1,070	360	124	76	26		366					
Acenaphthene	ug/kg	644	194		114	238	69	34	40	9		60					
Acenaphthylene	ug/kg	212	72		57	159	40	31	15	10		43					
Anthracene	ug/kg	1,100	440		266	531	153	108	100	26		174					
Benzo(a)anthracene	ug/kg	2,190	1,210		727	1,410	405	314	243	91		452					
Benzo(a)pyrene	ug/kg	2,130	1,020		651	1,220	356	281	206	80		384					
Benzo(b)fluoranthene	ug/kg	3,460	1,670		1,200	1,630	509	503	327	135		594					
Benzo(g,h,i)perylene	ug/kg	1,090	256		192	312	129	94	66	25		148					
Benzo(k)fluoranthene	ug/kg	1,040	599		355	562	196	133	97	47		176					
Chrysene	ug/kg	2,560	1,390		1,040	1,680	506	355	258	100		565					
Dibenzo(a,h)anthracene	ug/kg	284	83		62	107	40	30	20	8		44					
Fluoranthene	ug/kg	8,280	2,490		1,890	2,630	698	588	453	175		772					
Fluorene	ug/kg	930	276		210	416	116	73	62	19		126					
Indeno(1,2,3-cd)pyrene	ug/kg	1,010	293		207	355	129	102	70	28		145					
Naphthalene	ug/kg	2,180	495		394	1,010	294	159	90	33		307					
Phenanthrene	ug/kg	7,300	1,900		1,460	2,170	700	381	386	104		754					
Pyrene	ug/kg	7,110	2,260		1,800	2,590	750	579	462	171		790					
Total PAH18	ug/kg	44,430	15,404		11,197	18,624	5,709	3,977	3,025	1,106		6,165					

Shading Key: Results above CUG for Pb or Hg or disposal criteria for PAHs
 Results above 5 x disposal criteria

Table 3a: Bulk Sediment Analytical Results (ex

Parameters	DMU	FP-2	FP-2	FP-2	FP-2	FS-2	FS-2	FS-1	FS-1	FS-1	FS-1	FS-1	FS-1	HS-1	HS-1	HS-1	HS-1
	Location Depth Interval (in) Units/Date	HB17-30 0-22 06/23/2017	HB17-31 0-28 06/23/2017	HB17-31 28-40 06/23/2017	HB17-31 40-50 06/23/2017	HB17-08 24-36 06/20/2017	HB17-08 36-41 06/20/2017	HB17-21 0-20 06/22/2017	HB17-21 DUP 0-20 06/22/2017	HB17-22 0-33 06/22/2017	HB17-22 33-45 06/22/2017	HB17-22 45-58 06/22/2017	HB17-23 0-30 06/21/2017	HB17-04 72-84 06/19/2017	HB17-04 84-92 06/19/2017	HB17-28 0-63 06/22/2017	HB17-28 39-51 06/22/2017
Percent Solids	%	45.1	51.9	66.2	72	60.1	65.4	47.7	44.6	51.7	52.9	57.5	54.1	54.3	76.8	53.3	53.7
Total Organic Carbon	mg/kg							96,200	79,200	38,500			46,600			34,000	
Metals																	
Lead	mg/kg	114	127	59.6	19.9	243	179	333	274	310	195	175	158	94.2	17.9		71.5
Thallium	mg/kg							<0.74	<0.81	<0.59			0.83				
Mercury	mg/kg	0.4	0.53	0.13	0.09	0.075	0.3	0.4	0.28	0.54	0.58	0.3	0.75	0.25	0.061		0.51
PAHs																	
1-Methylnaphthalene	ug/kg							715	489	615			477			213	
2-Methylnaphthalene	ug/kg							993	675	849			655			304	
Acenaphthene	ug/kg							613	397	275			116			184	
Acenaphthylene	ug/kg							126	98	103			78			63	
Anthracene	ug/kg							1,400	974	527			302			444	
Benzo(a)anthracene	ug/kg							3,840	4,060	1,180			798			1,600	
Benzo(a)pyrene	ug/kg							4,040	3,440	935			722			1,310	
Benzo(b)fluoranthene	ug/kg							5,760	5,190	1,330			1,150			1,870	
Benzo(g,h,i)perylene	ug/kg							2,020	1,840	532			198			326	
Benzo(k)fluoranthene	ug/kg							2,180	1,920	450			377			569	
Chrysene	ug/kg							5,170	4,570	1,370			934			1,670	
Dibenzo(a,h)anthracene	ug/kg							551	480	141			64			100	
Fluoranthene	ug/kg							10,000	8,850	2,230			1,530			3,430	
Fluorene	ug/kg							792	567	440			207			240	
Indeno(1,2,3-cd)pyrene	ug/kg							2,050	1,860	512			216			352	
Naphthalene	ug/kg							911	572	705			559			404	
Phenanthrene	ug/kg							7,270	6,050	2,210			1,340			2,400	
Pyrene	ug/kg							8,880	7,580	2,130			1,520			2,840	
Total PAH18	ug/kg							57,311	49,612	16,534			11,243			18,319	

Shading Key: Results above CUG
Results above 5 x d

Table 3a: Bulk Sediment Analytical Results (ex

Parameters	DMU	HS-1	HS-1	HS-1	HS-1	HS-3	OC-11	OC-12	OC-12	OC-12	OC-12	OC-12	OC-12	OC-12	OC-16	OC-3	OC-7
	Location Depth Interval (in) Units/Date	HB17-28 51-63 06/22/2017	HB17-28 63-75 06/22/2017	HB17-28 75-87 06/22/2017	HB17-28 87-99 06/22/2017	HB17-02 0-11 06/19/2017	HB17-07 46-58 06/20/2017	HB17-19 0-42 06/21/2017	HB17-19 42-54 06/21/2017	HB17-19 54-66 06/21/2017	HB17-19 66-78 06/21/2017	HB17-19 78-90 06/21/2017	HB17-19 90-102 06/21/2017	HB17-19 102-112 06/21/2017	HB17-20 0-16 06/21/2017	HB17-17 0-16 06/21/2017	HB17-18 0-12 06/21/2017
Percent Solids	%	48.9	49.6	68.6	76	35.4	61	48.1	51.1	50.2	45.7	49.9	49.3	52.7	65.1	50.2	62.7
Total Organic Carbon	mg/kg							41,400							16,800	32,000	12,500
Metals																	
Lead	mg/kg	105	211	59.9	2	45.8	39.3	94.3	101	107	129	73.7	72.7	40.4		89.8	60.4
Thallium	mg/kg							<0.69								<0.53	<0.58
Mercury	mg/kg	0.97	0.51	0.25	0.0017	0.22	0.19	0.37								0.24	0.12
PAHs																	
1-Methylnaphthalene	ug/kg							196							48	184	65
2-Methylnaphthalene	ug/kg							250							75	255	91
Acenaphthene	ug/kg							59							19	35	35
Acenaphthylene	ug/kg							42							14	34	20
Anthracene	ug/kg							185							59	132	242
Benzo(a)anthracene	ug/kg							507							171	409	264
Benzo(a)pyrene	ug/kg							427							156	434	213
Benzo(b)fluoranthene	ug/kg							653							262	668	341
Benzo(g,h,i)perylene	ug/kg							197							51	244	80
Benzo(k)fluoranthene	ug/kg							195							73	181	115
Chrysene	ug/kg							532							184	434	320
Dibenzo(a,h)anthracene	ug/kg							55							16	68	23
Fluoranthene	ug/kg							830							318	654	473
Fluorene	ug/kg							126							38	85	75
Indeno(1,2,3-cd)pyrene	ug/kg							193							55	237	84
Naphthalene	ug/kg							253							91	227	95
Phenanthrene	ug/kg							696							195	461	345
Pyrene	ug/kg							832							324	715	454
Total PAH18	ug/kg							6,228							2,148	5,457	3,335

Shading Key: Results above CUG
Results above 5 x d

Table 3a: Bulk Sediment Analytical Results (ex)

Parameters	DMU Location Depth Interval (in) Units/Date	OC-7	OC-8	Screening Values		
		HB17-18 12-24 06/21/2017	HB17-35 0-17 06/23/2017	Cleanup Goal	Disposal Criteria	5xDisposal Criteria
Percent Solids	%	61.1	57.6			
Total Organic Carbon	mg/kg					
Metals						
Lead	mg/kg	20.1	297	83	400	2000
Thallium	mg/kg			NA	3.04	15.2
Mercury	mg/kg		0.47	0.64	3.13	15.65
PAHs						
1-Methylnaphthalene	ug/kg				17,600	88,000
2-Methylnaphthalene	ug/kg				239,000	1,195,000
Acenaphthene	ug/kg				3,590,000	17,950,000
Acenaphthylene	ug/kg				NA	
Anthracene	ug/kg				17,900,000	89,500,000
Benzo(a)anthracene	ug/kg				4,400	22,000
Benzo(a)pyrene	ug/kg				447	2,235
Benzo(b)fluoranthene	ug/kg				4,470	22,350
Benzo(g,h,i)perylene	ug/kg				NA	
Benzo(k)fluoranthene	ug/kg				11,500	57,500
Chrysene	ug/kg				115,000	575,000
Dibenzo(a,h)anthracene	ug/kg				447	2,235
Fluoranthene	ug/kg				2,390,000	11,950,000
Fluorene	ug/kg				2,390,000	11,950,000
Indeno(1,2,3-cd)pyrene	ug/kg				4,470	22,350
Naphthalene	ug/kg				5,520	27,600
Phenanthrene	ug/kg				NA	
Pyrene	ug/kg				NA	
Total PAH18	ug/kg					

Shading Key: Results above CUG
Results above 5 x d

Table 3b: Sediment VOC Analytical Results (detections shown in **bold**)

Parameters	DMU	CS-1	CS-2	FS-1	FS-1	FS-1
	Location Depth Interval (in) Units/Date	HB17-24 0-80 06/22/2017	HB17-25 0-30 06/22/2017	HB17-21 0-20 06/22/2017	HB17-21 DUP 0-20 06/22/2017	HB17-22 0-33 06/22/2017
VOCs						
1,1,1,2-Tetrachloroethane	mg/kg	<0.072	<0.057	<0.059	<0.063	<0.027
1,1,1-Trichloroethane	mg/kg	<0.062	<0.049	<0.050	<0.025	<0.023
1,1,2,2-Tetrachloroethane	mg/kg	<0.057	<0.045	<0.046	<0.036	<0.021
1,1,2-Trichloroethane	mg/kg	<0.041	<0.032	<0.033	<0.049	<0.015
1,1-Dichloroethane	mg/kg	<0.064	<0.051	<0.052	<0.054	<0.024
1,1-Dichloroethene	mg/kg	<0.067	<0.053	<0.054	<0.056	<0.025
1,1-Dichloropropene	mg/kg	<0.028	<0.022	<0.023	<0.058	<0.011
1,2,3-Trichlorobenzene	mg/kg	<0.057	<0.024	<0.046	<0.049	<0.021
1,2,3-Trichloropropane	mg/kg	<0.057	<0.045	<0.046	<0.049	<0.021
1,2,4-Trichlorobenzene	mg/kg	<0.077	<0.045	<0.063	<0.067	<0.029
1,2,4-Trimethylbenzene	mg/kg	<0.067	<0.045	<0.054	<0.058	<0.025
1,2-Dibromo-3-chloropropane	mg/kg	<0.10	<0.047	<0.084	<0.089	<0.039
1,2-Dibromoethane	mg/kg	<0.059	<0.047	<0.048	<0.051	<0.022
1,2-Dichlorobenzene	mg/kg	<0.075	<0.053	<0.061	<0.065	<0.028
1,2-Dichloroethane	mg/kg	<0.059	<0.055	<0.048	<0.051	<0.022
1,2-Dichloropropane	mg/kg	<0.031	<0.055	<0.025	<0.027	<0.012
1,3,5-Trimethylbenzene	mg/kg	<0.057	<0.059	<0.046	<0.049	<0.021
1,3-Dichlorobenzene	mg/kg	<0.070	<0.061	<0.056	<0.060	<0.026
1,3-Dichloropropane	mg/kg	<0.077	<0.061	<0.063	<0.067	<0.029
1,4-Dichlorobenzene	mg/kg	<0.070	<0.081	<0.056	<0.060	<0.026
2,2-Dichloropropane	mg/kg	<0.046	<0.010	<0.038	<0.040	<0.017
2-Butanone	mg/kg	0.25	<0.020	0.232	<0.20	<0.087
2-Chlorotoluene	mg/kg	<0.067	<0.032	<0.054	<0.058	<0.025
2-Hexanone	mg/kg	<0.28	<0.036	<0.23	<0.25	<0.11
4-Chlorotoluene	mg/kg	<0.067	<0.036	<0.054	<0.058	<0.025
4-Methyl-2-pentanone	mg/kg	<0.18	<0.043	<0.15	<0.16	<0.068
Acetone	mg/kg	<0.72	<0.045	<0.59	4.63	2.05
Benzene	mg/kg	<0.013	<0.047	<0.010	<0.011	<0.0048
Bromobenzene	mg/kg	<0.077	<0.053	<0.063	<0.067	<0.029
Bromochloromethane	mg/kg	<0.026	<0.053	<0.021	<0.022	<0.0097
Bromodichloromethane	mg/kg	<0.041	<0.061	<0.033	<0.036	<0.015
Bromoform	mg/kg	<0.046	<0.081	<0.038	<0.040	<0.017
Bromomethane	mg/kg	<0.10	<0.10	<0.084	<0.089	<0.039
Carbon disulfide	mg/kg	<0.21	<0.12	<0.17	<0.18	<0.077
Carbon tetrachloride	mg/kg	<0.057	<0.14	<0.046	<0.049	<0.021
Chlorobenzene	mg/kg	<0.059	<0.16	<0.048	<0.051	<0.022
Chloroethane	mg/kg	<0.15	<0.18	<0.13	<0.13	<0.058
Chloroform	mg/kg	<0.054	<0.22	<0.044	<0.047	<0.020
Chloromethane	mg/kg	<0.13	<0.57	<0.10	<0.11	<0.048
cis-1,2-Dichloroethene	mg/kg	<0.070	<0.055	<0.056	<0.060	<0.026
cis-1,3-Dichloropropene	mg/kg	<0.049	<0.038	<0.040	<0.042	<0.018
Dibromochloromethane	mg/kg	<0.046	<0.036	<0.038	<0.040	<0.017
Dibromomethane	mg/kg	<0.031	<0.024	<0.025	<0.027	<0.012
Dichlorodifluoromethane	mg/kg	<0.10	<0.081	<0.084	<0.089	<0.039
Diisopropyl ether	mg/kg	<0.077	<0.061	<0.063	<0.067	<0.029
Ethylbenzene	mg/kg	<0.054	<0.043	<0.044	<0.047	<0.020
Hexachlorobutadiene	mg/kg	<0.072	<0.057	<0.059	<0.063	<0.027
Isopropylbenzene	mg/kg	<0.064	<0.051	<0.052	<0.056	<0.024
m & p-Xylene	mg/kg	<0.070	<0.055	<0.056	<0.060	<0.026
Methyl tert-butyl ether	mg/kg	<0.062	<0.049	<0.050	<0.054	<0.023
Methylene chloride	mg/kg	<0.077	<0.061	<0.063	<0.067	<0.029
Naphthalene	mg/kg	0.15	<0.059	<0.061	<0.065	0.0309
n-Butylbenzene	mg/kg	<0.067	<0.053	<0.054	<0.058	<0.025
n-Propylbenzene	mg/kg	<0.067	<0.053	<0.054	<0.058	<0.025
o-Xylene	mg/kg	<0.062	<0.049	<0.050	<0.054	<0.023
p-Isopropyltoluene	mg/kg	<0.057	<0.045	<0.046	<0.049	<0.021
sec-Butylbenzene	mg/kg	<0.072	<0.057	<0.059	<0.063	<0.027
Styrene	mg/kg	<0.075	<0.059	<0.061	<0.065	<0.028
tert-Butylbenzene	mg/kg	<0.064	<0.051	<0.052	<0.056	<0.024
Tetrachloroethene	mg/kg	<0.034	<0.026	<0.027	<0.029	<0.013
Tetrahydrofuran	mg/kg	0.624	0.521	0.605	1.56	0.681
Toluene	mg/kg	0.135	0.0462	0.0404	0.177	0.0513
trans-1,2-Dichloroethene	mg/kg	<0.026	<0.020	<0.021	<0.022	<0.0097
trans-1,3-Dichloropropene	mg/kg	<0.059	<0.047	<0.048	<0.051	<0.022
Trichloroethene	mg/kg	<0.039	<0.030	<0.031	<0.033	<0.014
Trichlorofluoromethane	mg/kg	<0.10	<0.081	<0.084	<0.089	<0.039
Vinyl acetate	mg/kg	<0.31	<0.24	<0.25	<0.27	<0.12
Vinyl chloride	mg/kg	<0.026	<0.020	<0.021	<0.022	<0.0097

Table 4: SPLP Analytical Results

Parameter	DMU Location Depth Interval (in) Units/Date	CS-1	CS-2	FC-1	FC-3	FS-1	FS-1	FS-1	OC-16	NR 140	NR 140
		HB17-24 0-80 06/22/2017	HB17-25 0-30 06/22/2017	HB17-10 44-86 06/21/2017	HB17-11 17-51 06/21/2017	HB17-21 0-20 06/22/2017	HB17-21 0-20 06/22/2017	HB17-23 0-30 06/21/2017	HB17-20 0-16 06/21/2017	Preventive Action Limit -	Enforcement Standard -
Metals											
Arsenic	mg/L	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	2	10
Barium	mg/L	<0.00070	0.016	0.015	0.014	0.032	0.028	0.025	<0.00070	400	2000
Cadmium	mg/L	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	0.5	5
Chromium	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0021	<0.0010	<0.0010	10	100
Selenium	mg/L	<0.012	<0.012	<0.012	<0.012	<0.0015	<0.0015	<0.0015	<0.0015	10	50
Silver	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.012	<0.012	<0.012	<0.012	10	50
Lead	mg/L	<0.0015	<0.0015	<0.0015	0.0023	<0.0020	<0.0020	<0.0020	<0.0020	1.5	15
Mercury	mg/L	0.000089	<0.000020	0.000056	0.000066	<0.000020	<0.000020	0.000046	0.000033	0.2	2
PAHs											
1-Methylnaphthalene	ug/L	0.31	5.8	0.067	1.8	0.086	0.063	0.57	0.054	NSE	NSE
2-Methylnaphthalene	ug/L	0.23	10	0.072	1.8	0.1	0.071	0.52	0.049	NSE	NSE
Acenaphthene	ug/L	0.077	0.66	0.077	0.54	0.071	0.069	0.029	0.089	NSE	NSE
Acenaphthylene	ug/L	<0.0030	0.0097	<0.0030	0.027	<0.0030	<0.0030	0.0047	<0.0030	NSE	NSE
Anthracene	ug/L	0.02	0.02	0.021	0.15	0.022	0.022	0.012	0.02	600	300
Benzo(a)anthracene	ug/L	0.011	0.0096	0.012	0.015	0.0092	0.0099	0.011	0.01	NSE	NSE
Benzo(a)pyrene	ug/L	0.0063	<0.0050	0.0055	0.008	<0.0050	0.0055	<0.0050	<0.0050	0.02	0.2
Benzo(b)fluoranthene	ug/L	0.011	<0.0080	0.0089	0.013	<0.0080	<0.0080	<0.0080	<0.0080	0.02	0.2
Benzo(g,h,i)perylene	ug/L	0.0053	<0.0050	0.0051	0.0066	<0.0050	0.0064	<0.0050	<0.0050	NSE	NSE
Benzo(k)fluoranthene	ug/L	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	NSE	NSE
Chrysene	ug/L	0.014	0.008	0.012	0.017	0.012	0.012	0.0093	0.0061	0.02	0.2
Dibenzo(a,h)anthracene	ug/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NSE	NSE
Fluoranthene	ug/L	0.087	0.091	0.094	0.22	0.11	0.1	0.079	0.064	80	400
Fluorene	ug/L	0.046	0.043	0.031	0.38	0.054	0.052	0.017	0.045	80	400
Indeno(1,2,3-cd)pyrene	ug/L	<0.0050	<0.0050	<0.0050	0.0052	<0.0050	0.0056	<0.0050	<0.0050	NSE	NSE
Naphthalene	ug/L	0.11	2.7	0.098	1.3	0.047	0.074	0.36	0.11	10	100
Phenanthrene	ug/L	0.12	0.14	0.15	0.86	0.16	0.17	0.11	0.13	NSE	NSE
Pyrene	ug/L	0.07	0.071	0.071	0.13	0.076	0.078	0.062	0.048	50	250

Table 5: TCLP Analytical Results

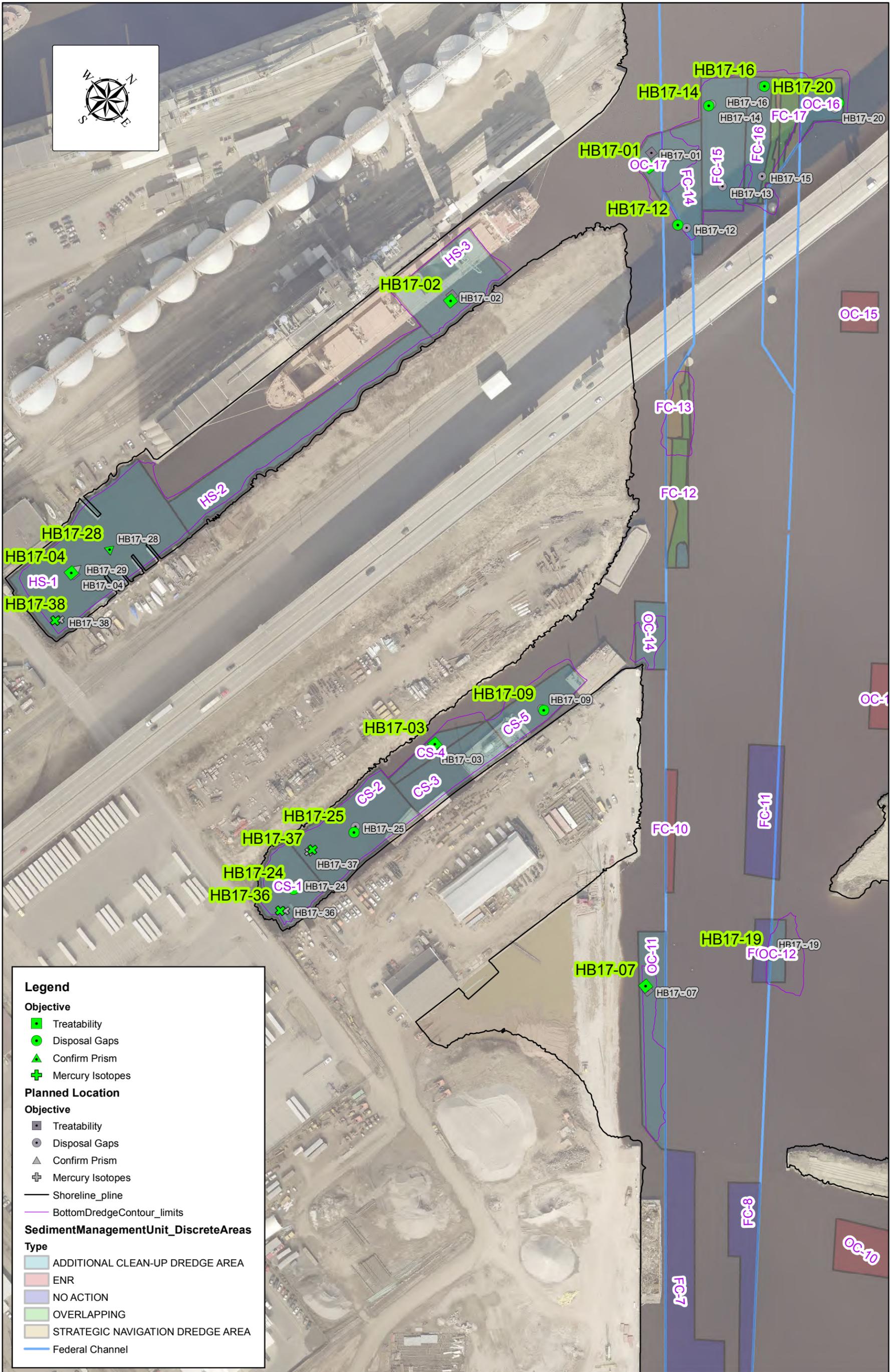
Parameter	DMU Location Depth Interval (in) Units/Date	CS-1 HB17-24 0-80 06/22/2017	CS-2 HB17-25 0-30 06/22/2017	FS-1 HB17-21 0-20 06/22/2017	FS-1 HB17-21 DUP 0-20 06/22/2017	TCLP Standard NR 661.24 (mg/L)
Metals						
Arsenic	mg/L	0.056	0.024	<0.0060	0.031	5
Barium	mg/L	0.9	1	0.76	0.8	100
Cadmium	mg/L	0.0094	0.0071	0.0039	0.011	1
Chromium	mg/L	0.0061	0.0015	0.0033	0.0044	5
Selenium	mg/L	0.018	0.018	0.016	0.019	1
Silver	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	5
Lead	mg/L	0.26	0.14	0.13	0.21	5
Mercury	mg/L	<0.000020	0.000053	0.000053	<0.000020	0.2
PAHs						
1-Methylnaphthalene	ug/L	0.21	0.22	0.049	0.056	NSE
2-Methylnaphthalene	ug/L	0.29	0.25	0.029	0.07	NSE
Acenaphthene	ug/L	0.11	0.1	0.074	0.085	NSE
Acenaphthylene	ug/L	<0.0030	<0.0030	<0.0030	<0.0030	NSE
Anthracene	ug/L	0.024	0.021	0.023	0.058	NSE
Benzo(a)anthracene	ug/L	0.011	0.0085	0.0098	0.0092	NSE
Benzo(a)pyrene	ug/L	<0.0050	<0.0050	<0.0050	<0.0050	NSE
Benzo(b)fluoranthene	ug/L	<0.0080	<0.0080	<0.0080	<0.0080	NSE
Benzo(g,h,i)perylene	ug/L	<0.0050	<0.0050	<0.0050	<0.0050	NSE
Benzo(k)fluoranthene	ug/L	<0.0060	<0.0060	<0.0060	<0.0060	NSE
Chrysene	ug/L	0.0066	0.005	0.0095	0.0091	NSE
Dibenzo(a,h)anthracene	ug/L	<0.0050	<0.0050	<0.0050	<0.0050	NSE
Fluoranthene	ug/L	0.086	0.079	0.099	0.12	NSE
Fluorene	ug/L	0.052	0.028	0.047	0.081	NSE
Indeno(1,2,3-cd)pyrene	ug/L	<0.0050	<0.0050	<0.0050	<0.0050	NSE
Naphthalene	ug/L	0.34	0.24	0.037	0.042	NSE
Phenanthrene	ug/L	0.18	0.088	0.16	0.22	NSE
Pyrene	ug/L	0.065	0.064	0.076	0.089	NSE

Table 6: WDNR Recommended Changes to dredge cut elevations for dredge prims for locations sampled

Location	Unit	Refusal	Surface Elevation	Contamination Elevation	65% Design Cut Elevation	Difference Contamination vs Proposed Cut	Recommended changes to cut depth at sample location	Suggested Cut Elevation	Magnitude of Change (feet)	LWD Depth at 65% Cutline	LWD Depth at Proposed Cutline	Notes
HB17-04	HS-1	Yes	587.92	580.95	581	0.05	None	581	0	20.1	20.1	
HB17-28	HS-1	Yes	587.2	580.95	582.4	1.45	1.5 ft. deeper	580.9	-1.5	18.7	20.2	Pb 211 mg/kg at 75 inches, Hg 1 mg/kg at 63 inches, did not sample for TBT.
HB17-02	HS-3	Yes	580.84	579.92	578.9	-1.02	None	578.9	0	22.2	22.2	Did not get to target depth on core that was sampled. Can treatability bucket HB17-02 be tested for mercury?
HB17-01	OC-17	No	577.21	576	576	0.00	None	576	0	25.1	25.1	Did not sample.
HB17-12	FC-14	Yes	573.76	571.2	571.2	0.00	None	571.2	0	29.9	29.9	PAH & TOC only
HB17-14	FC-15	No	573.5	570.89	570.89	0.00	None	570.89	0	30.21	30.21	PAH & TOC only
HB17-16	FC-16	Yes	572.89	566.87	566.87	0.00	None	566.87	0	34.23	34.23	PAH & TOC only
HB17-20	OC-16	Yes	592.75	590.5	590.5	0.00	None	590.5	0	10.6	10.6	PAH & TOC only
HB17-24	CS-1	Yes	592.73	586.06	585.66	-0.40	None	585.66	0	15.44	15.44	Bottom not clean: Pb 302 mg/kg & Hg 1.5 mg/kg
HB17-25	CS-2	Yes	589.76	587.26	585.8	-1.46	None	585.8	0	15.3	15.3	Bottom not clean: Pb 205 mg/kg & Hg 0.86 mg/kg
HB17-03	CS-4	No	594.31	591.94	591.94	0.00	None	591.94	0	9.16	9.16	Clean bottom
HB17-09	CS-5	Yes	587.7	585.2	585.8	0.60	0.5 ft. deeper	585.3	-0.5	15.3	15.8	Bottom not clean: Pb 109 mg/kg
HB17-19	OC-12	No	578.93	572.43	575.43	3.00	3 ft. deeper	572.43	-3	25.67	28.67	Clean below 78"
HB17-07	OC-11	Yes	586.5	583.4	583.4	0.00	None	583.4	0	17.7	17.7	Clean bottom
HB17-21	FS-1	Yes	589.5	588.97	587.9	-1.07	1.0 ft shallower to 589'	588.9	1	13.2	12.2	Bottom not clean: Pb 333 mg/kg. Red clay at 20 inches
HB17-22	FS-1	No	590.64	585.39	587.1	1.71	1.5 ft. deeper & eliminate lobe from 587 contour line	585.6	-1.5	14	15.5	Bottom not clean: Pb 175 mg/kg
HB17-23	FS-1	Yes	590.22	587	585	-2.00	2 ft shallower to 587'	587	2	16.1	14.1	Bottom not clean: Pb 158 mg/kg. Red clay at 30 inches.
HB17-08	FS-2	Yes	589.1	585.68	586.2	0.52	0.5 ft. deeper	585.7	-0.5	14.9	15.4	Bottom not clean: Pb 243 mg/kg
HB17-35	OC-8	Yes	584.28	582.86	581.5	-1.36	1.0 ft shallower to 582.5'	582.5	1	19.6	18.6	Bottom not clean: Pb 297 mg/kg, red clay at bottom of tube
HB17-18	OC-7	Yes	581.51	581.51	580.4	-1.11	Why dredge this location? 1.1 ft. shallower	581.5	1.1	20.7	19.6	Clean - full profile
HB17-11	FC-3	Yes	575.01	570.76	570.4	-0.36	None	570.4	0	30.7	30.7	Bottom not clean: Pb 91 mg/kg
HB17-06	FC-2	Yes	574.47	569.47	570.5	1.03	1.0 ft. deeper to 569.5'	569.5	-1	30.6	31.6	Bottom not clean: Pb 97 mg/kg. Red clay at 60 inches.
HB17-10	FC-1	Yes	574.47	570.03	569.9	-0.13	None	569.9	0	31.2	31.2	Bottom not clean: Pb 175 mg/kg
HB17-17	OC-3	No	584.49	583.16	580.95	-2.21	2.0 ft. shallower to 582.95. Straighten cut lines?	582.95	2	20.15	18.15	Bottom not clean: Pb 175 mg/kg. Red clay at 16 inches
HB17-30	FP-2	Yes	589.45	587.62	584.4	-3.22	None	584.4	0	16.7	16.7	Bottom not clean: Pb 114 mg/kg - Core tube tipped
HB17-26	FP-2	No	585.16	582.16	584.95	2.79	2.74 ft deeper to 582.2	582.21	-2.74	16.15	18.89	Clean below 36 inches
HB17-05	FP-2	No	585.76	581.59	581.3	-0.29	None	581.3	0	19.8	19.8	No sample
HB17-31	FP-2	No	586.77	584.44	584.5	0.06	None	584.5	0	16.6	16.6	Clean below 28 inches

FIGURES (6 of 8 Figures not included with all copies)

Howards Bay 2017 Sediment Sampling Overview - North Half



Legend

Objective

- Treatability
- Disposal Gaps
- ▲ Confirm Prism
- + Mercury Isotopes

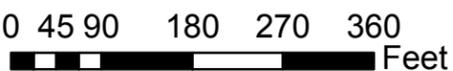
Planned Location

- Treatability
- Disposal Gaps
- ▲ Confirm Prism
- + Mercury Isotopes
- Shoreline_pline
- BottomDredgeContour_limits

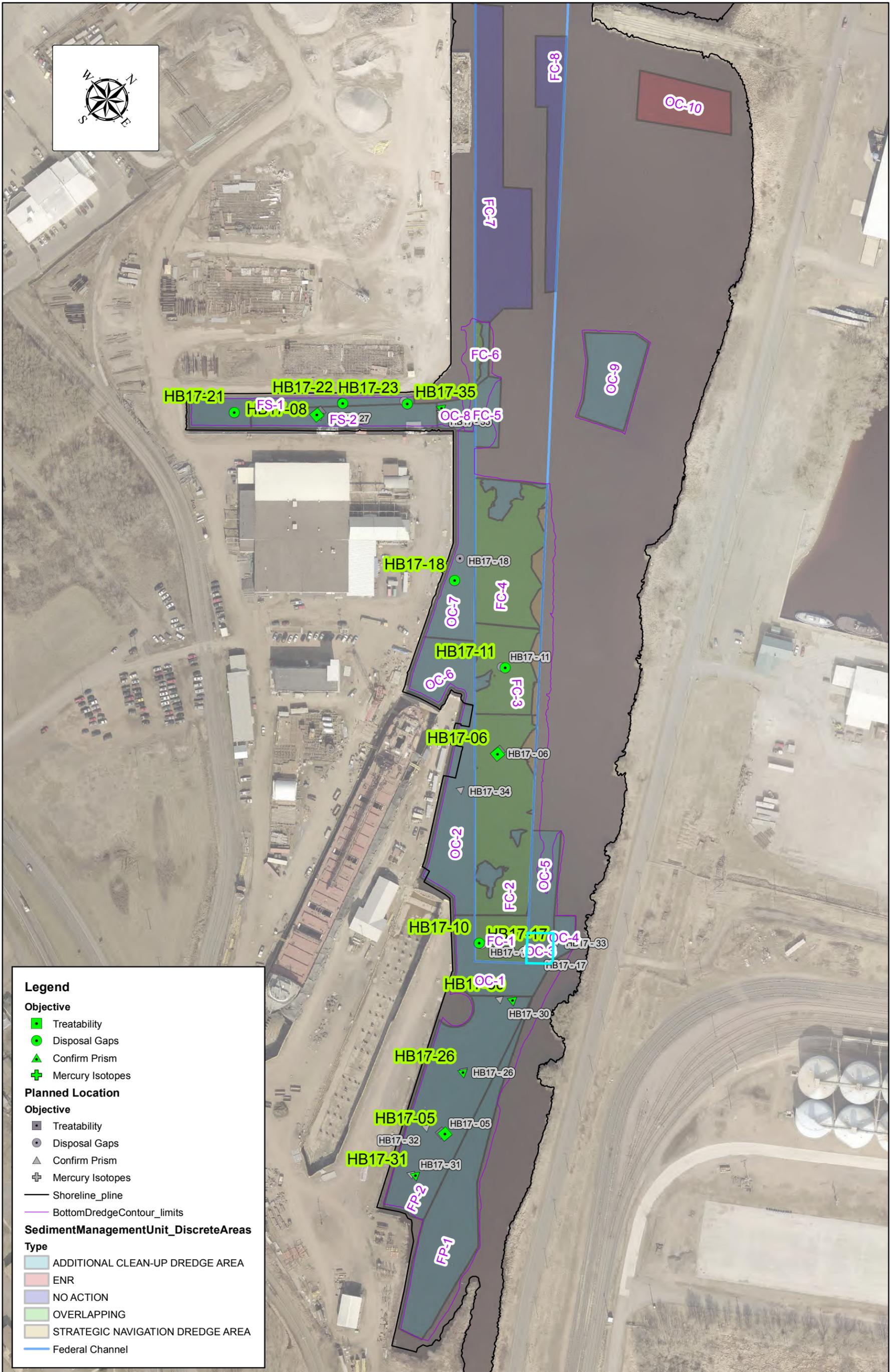
SedimentManagementUnit_DiscreteAreas

Type

- ADDITIONAL CLEAN-UP DREDGE AREA
- ENR
- NO ACTION
- OVERLAPPING
- STRATEGIC NAVIGATION DREDGE AREA
- Federal Channel



Howards Bay 2017 Sediment Sampling Overview - South Half



Legend

Objective

- Treatability
- Disposal Gaps
- ▲ Confirm Prism
- ⊕ Mercury Isotopes

Planned Location

Objective

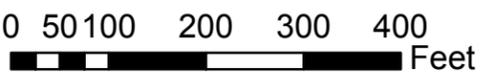
- Treatability
- Disposal Gaps
- ▲ Confirm Prism
- ⊕ Mercury Isotopes

— Shoreline_pline
 — BottomDredgeContour_limits

SedimentManagementUnit_DiscreteAreas

Type

- ADDITIONAL CLEAN-UP DREDGE AREA
- ENR
- NO ACTION
- OVERLAPPING
- STRATEGIC NAVIGATION DREDGE AREA
- Federal Channel



PHOTOS

Howards Bay 2017 Sediment Sampling— Select Photos taken by Joe Graham (Canon Powershot A710)



Ponar grab sample for treatability testing at HB17-01



Sediment sample for treatability testing—Typical



Core taken with Vibracore —Typical



Extraction of core HB17-17 into pan. (Photo 1 of 3): Top to right. Note plug of dense red clay from core bottom (left)



Extraction of core HB17-17 into pan. (Photo 2 of 3): Red clay plug split lengthwise.



Extraction of core HB17-17 into pan. (Photo 3 of 3): Close-up of red clay plug split lengthwise.



Soft silty clay over dense fine sand - Typical



Extraction of core HB17-21, note red clay plug from bottom of core.

Howards Bay 2017 Sediment Sampling—Select Photos taken by Joe Graham (Cannon Powershot A710)



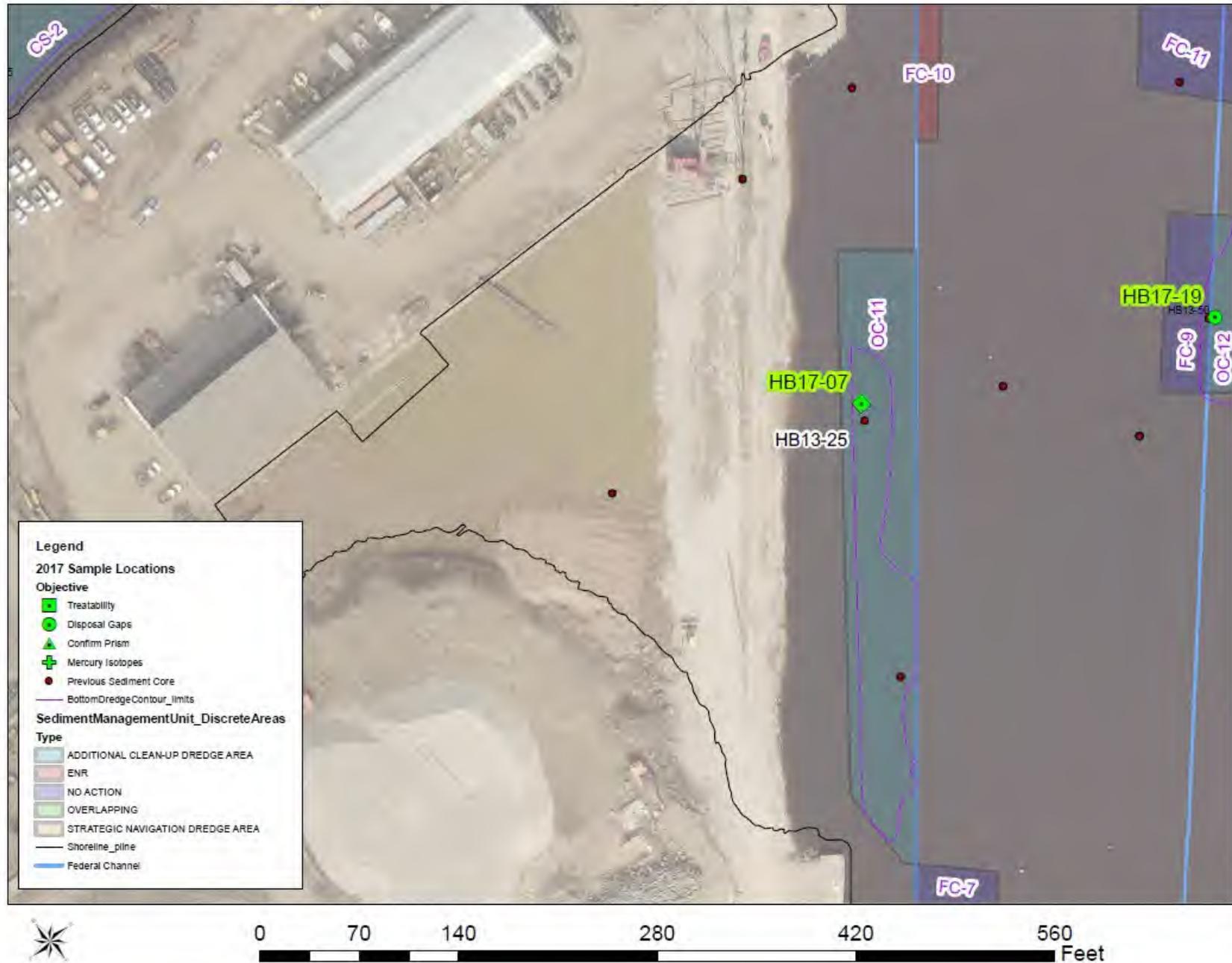
Warehouse for sale in Hughitt Slip—cracks in bricks & motor were evident from top to bottom at right corner.



End of warehouse and possible old intake structure in Hughitt Slip

MAP, CORE LOG, AND PHOTOGRAPHS REFERENCED IN OTHER OBSERVATIONS SECTION

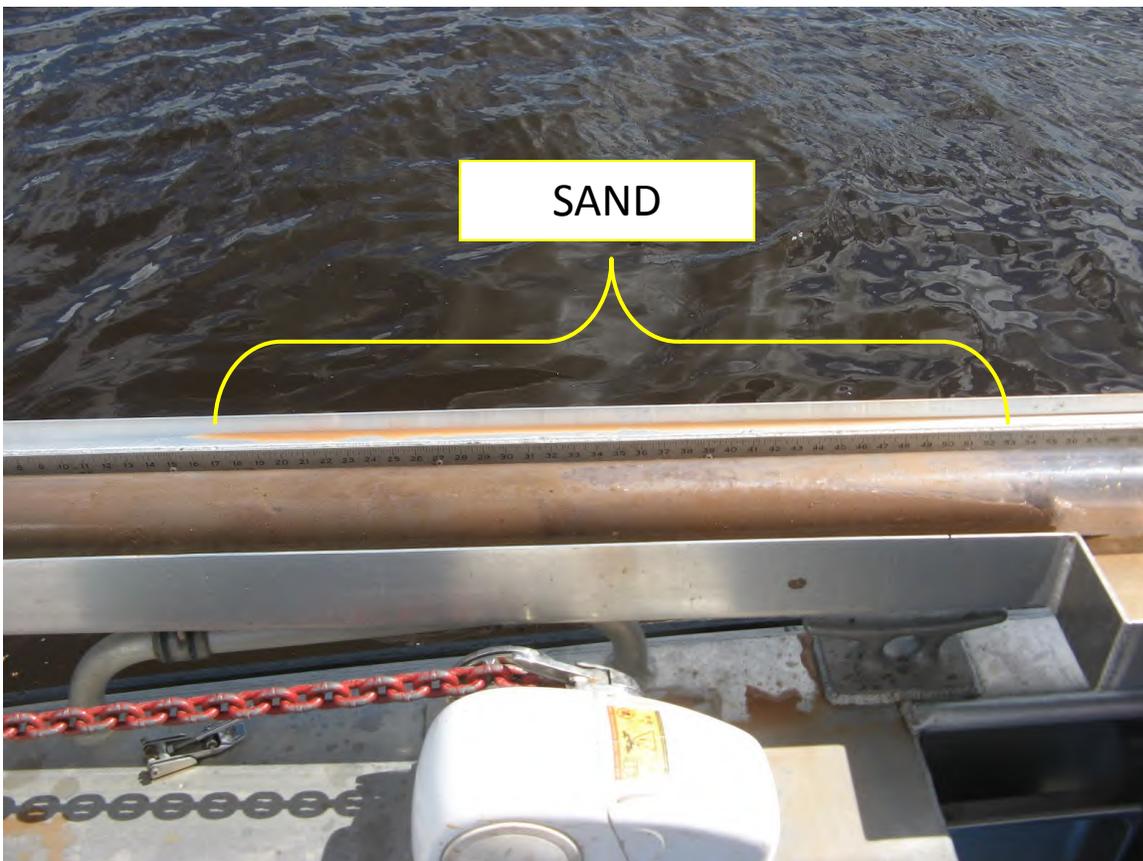
Map showing locations of sediment cores HB17-07 and HB13-25



Photographs: Location HB17-07 (page 1 of 2)



Typical Core at HB17-07: Cores at this location were collected off right side of the boat using boom arm of crane. Photographed by J. Graham 06/20/2017 with Cannon Power Shot A710.



Core 1 of 5 at HB17-07 for USACE treatability sample: Top is to right. The lighter brown material is sand. Yellow bracket and text superimposed. Photographed by J. Graham 06/20/2017 with Cannon Power Shot A710.

Photographs: Location HB17-07 (page 2 of 2)



Contents of Core 1 of 5 at HB17-07 for USACE treatability sample; bucket contains sand from top of core , pan at right has 12 inches of brown silty clay from bottom of the core tube. Photographed by J. Graham 06/20/2017 with Cannon Power Shot A710.



SAMPLE COLLECTION FIELD LOG

Project Title: Fraser Shipyards **Sampling Date:** 09122013
Project #: CI001796.0001 **Sample Matrix:** Sediment
Field Personnel: P Viana, J Mayo, S Inman, E Endsley **Sampling Method:** Vibracore
Weather: Clear skies, 70's **Logged by:** JM, PV
Sample ID: HB13-25 **Latitude:** _____ **Longitude:** _____

Sample Location ID	Time	Water Depth (ft)	Penetration Depth (ft)	Recovery Depth (ft)	CT Length (ft)
HB13-25	1501	17'4"	5'6"	57"	7'6"

Depth (inches)	Description	PID
0-36	silt with little sand, grey brown, poorly sorted, medium plasticity, very soft, wet	
36-47	clay, trace sand, organics, brown, poorly sorted, high plasticity, soft, wet	
47-48	organics with clay, brown, poorly sorted, high plasticity, soft, wet	
48-57	clay, trace sand, organics, brown, poorly sorted, high plasticity, soft, wet	

Additional Notes:

Top depth interval: _____
Bottom depth interval: _____
Sample IDs for analysis: _____
Sample IDs on hold: _____
Constituents Sampled: _____
Photos: _____
Comments: 86% recovery

Photographs of Core HB13-25 (Page 1 of 4)



Full profile—no flash. Top is to left. Top is grey brown silt. See core log for full description. Photo by ARCADIS 09/12/2013.



Full profile—with flash. Top is to left. Top is grey brown silt. See core log for full description. Photo by ARCADIS 09/12/2013.

Photographs of Core HB13-25 (Page 2 of 4)



Core HB13-25: 0 to 12 inch depth interval. Grey Brown Silt. See core log for full description. Photo by ARCADIS 09/12/2013



Core HB13-25: 12 to 24 inch depth interval. Grey brown silt. See core log for full description. Photo by ARCADIS 09/12/2013.

Photographs of Core HB13-25 (Page 2 of 4)



Core HB13-25: 24 to 36 inch depth interval. Grey Brown Silt. See core log for full description. Photo by ARCADIS 09/12/2013



Core HB13-25: 36 to 48 inch depth interval. Brown clay with organics. See core log for full description. Photo by ARCADIS

Photographs of Core HB13-25 (Page 2 of 4)



Core HB13-25: 48 to 57 inch depth interval. Brown clay. See core log for full description. Photo by ARCADIS 09/12/2013

LABORATORY REPORTS (Not included with all copies)

QAPP (not included with all copies)

ATTACHMENT 3

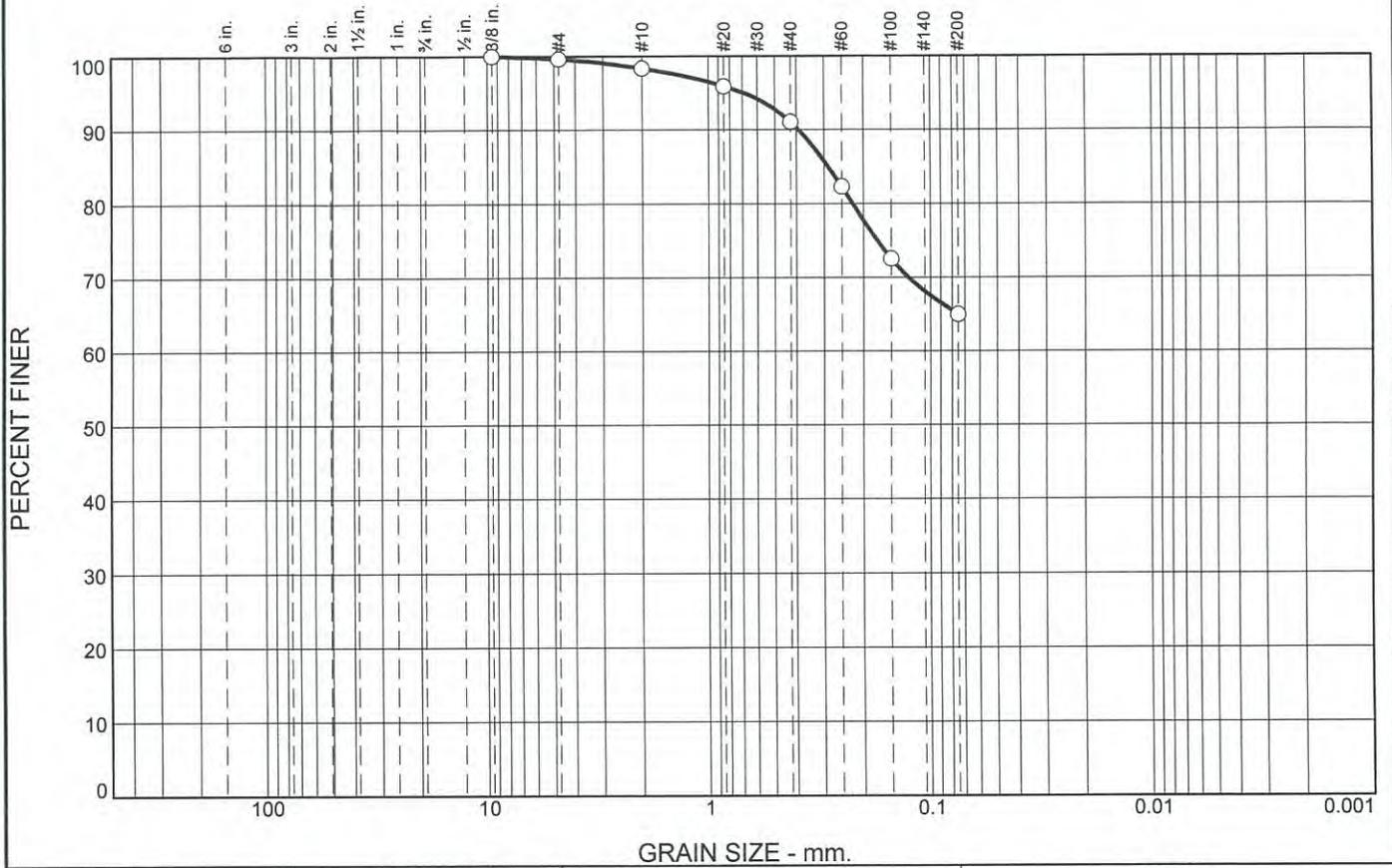
Geotechnical Laboratory Data



STEP 1



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	1.2	7.3	26.1	65.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375	100.0		
#4	99.6		
#10	98.4		
#20	95.9		
#40	91.1		
#60	82.3		
#100	72.6		
#200	65.0		

Material Description

PL= 28 **Atterberg Limits** LL= 37 PI= 9

D₉₀= 0.3910 **Coefficients** D₈₅= 0.2874

D₅₀= D₃₀= D₆₀=

D₁₀= C_u= C_c=

USCS= **Classification** AASHTO=

Remarks

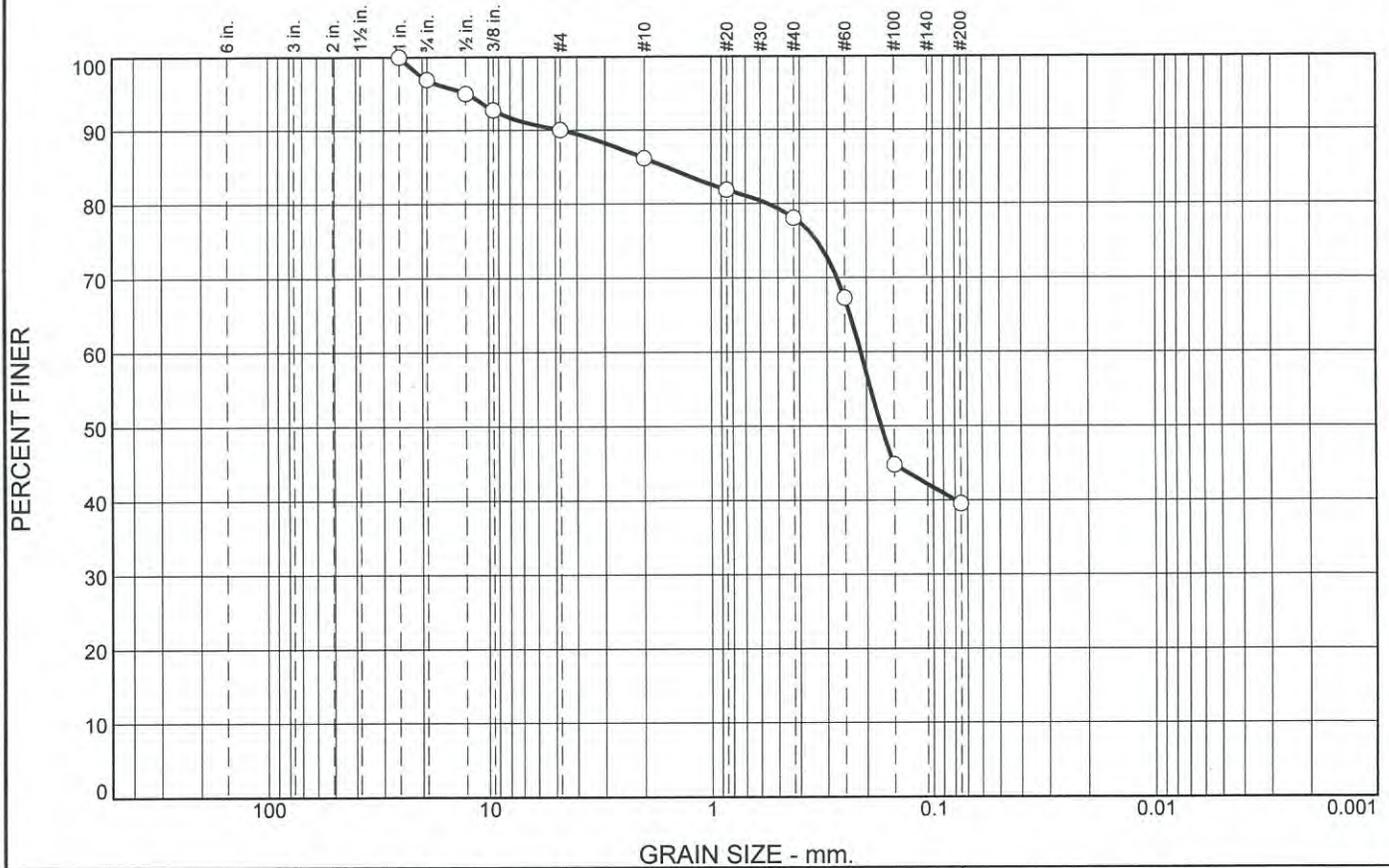
* (no specification provided)

Location: Howards Bay Sample Number: HB17-01 Date: 07/24/2017

JLT Laboratories, Inc. Canonsburg, PA	Client: ARCADIS-US Project: Howards Bay Treatment Study ARCADIS Project ID: 16935001.0000.00001 Project No: 17LS3573.01
	Figure

Tested By: MS Checked By: JB

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.1	6.9	3.8	8.1	38.6	39.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.00	100.0		
0.75	96.9		
0.50	95.0		
0.375	92.8		
#4	90.0		
#10	86.2		
#20	81.9		
#40	78.1		
#60	67.3		
#100	44.8		
#200	39.5		

Material Description

PL= 30 **Atterberg Limits** LL= 42 PI= 12

D₉₀= 4.7020 **Coefficients** D₈₅= 1.5910
 D₅₀= 0.1712 D₃₀= D₆₀= 0.2115
 D₁₀= C_u= D₁₅=
 C_c=

USCS= **Classification** AASHTO=
 Remarks

* (no specification provided)

Location: Howards Bay
 Sample Number: HB17-02

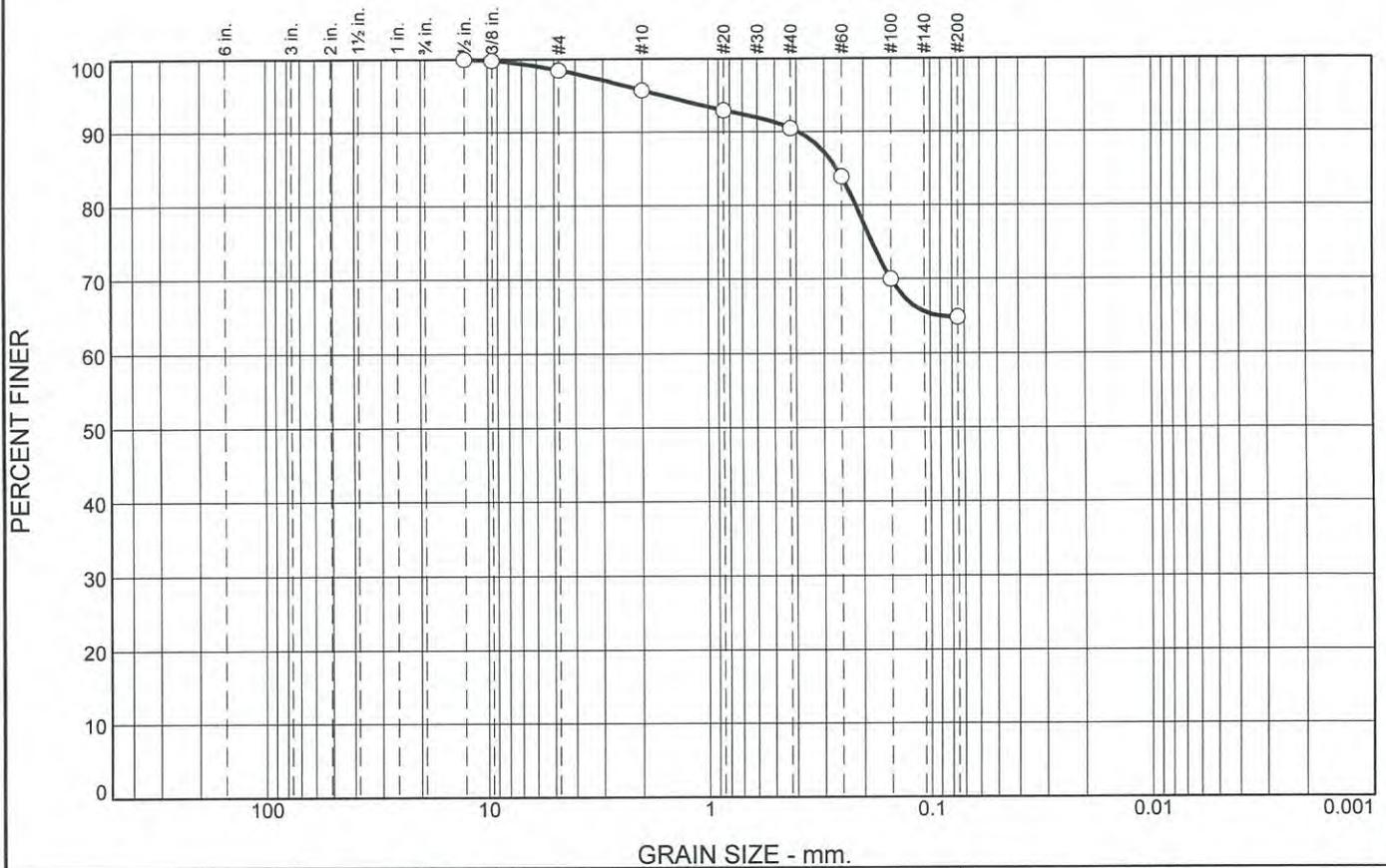
Date: 07/24/2017

JLT Laboratories, Inc. Canonsburg, PA	Client: ARCADIS-US Project: Howards Bay Treatment Study ARCADIS Project ID: 16935001.0000.00001 Project No: 17LS3573.01
Figure	

Tested By: MS

Checked By: JB

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.5	2.8	5.2	25.6	64.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.50	100.0		
0.375	99.8		
#4	98.5		
#10	95.7		
#20	92.9		
#40	90.5		
#60	83.9		
#100	70.0		
#200	64.9		

Material Description

PL= 34 **Atterberg Limits** LL= 53 PI= 19
Coefficients
 D₉₀= 0.3923 D₈₅= 0.2624 D₆₀=
 D₅₀= D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Classification
 USCS= AASHTO=

Remarks

* (no specification provided)

Location: Howards Bay
 Sample Number: HB17-03

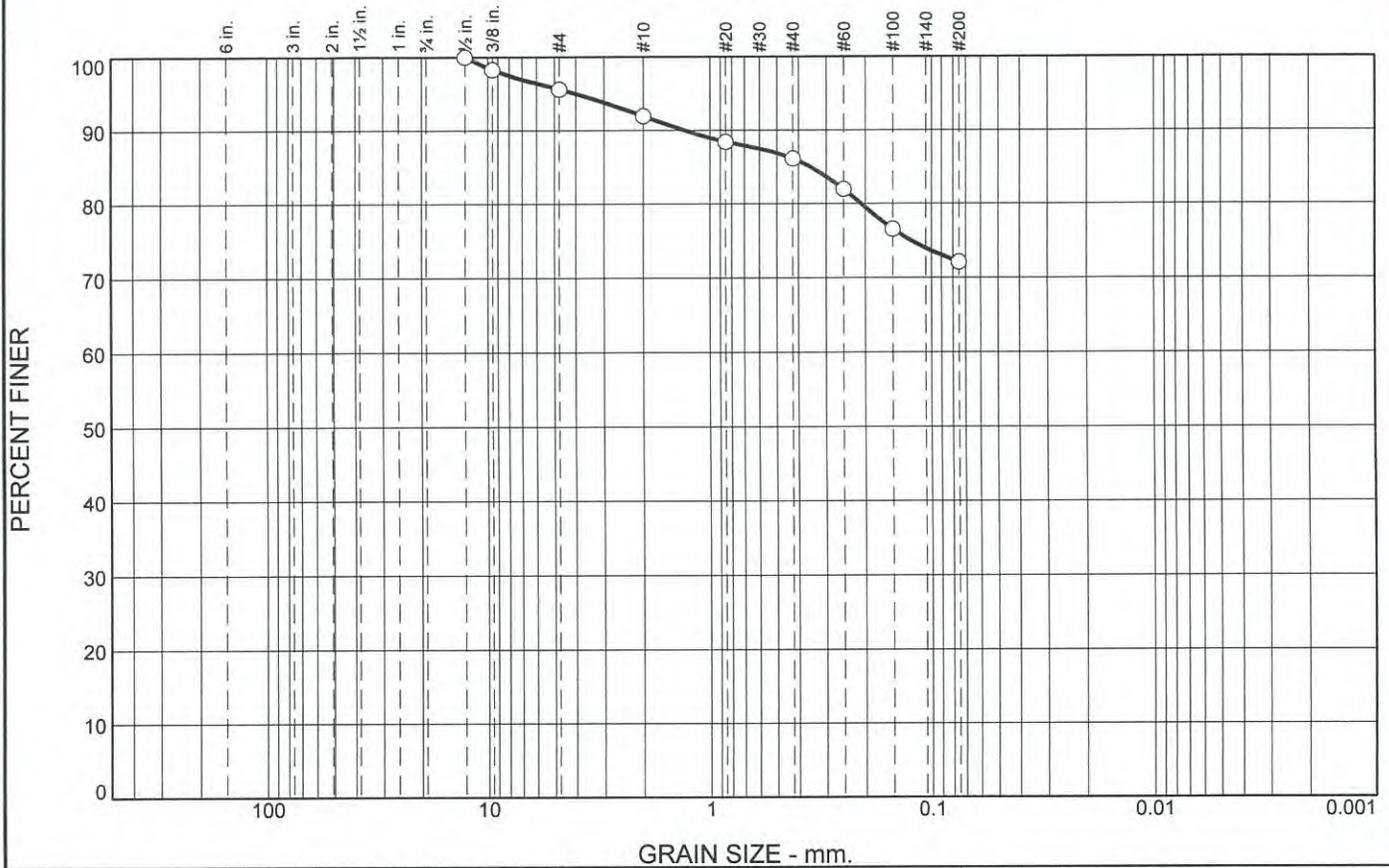
Date: 07/24/2017

JLT Laboratories, Inc. Canonsburg, PA	Client: ARCADIS-US Project: Howards Bay Treatment Study ARCADIS Project ID: 16935001.0000.00001 Project No: 17LS3573.01
Figure	

Tested By: MS

Checked By: JB

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.4	3.7	5.7	14.1	72.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.50	100.0		
0.375	98.3		
#4	95.6		
#10	91.9		
#20	88.4		
#40	86.2		
#60	82.0		
#100	76.6		
#200	72.1		

Material Description

PL= 38 **Atterberg Limits** LL= 51 PI= 13

D₉₀= 1.2973 **Coefficients** D₈₅= 0.3524

D₅₀= D₃₀= D₆₀=

D₁₀= C_u= C_c=

USCS= **Classification** AASHTO=

Remarks

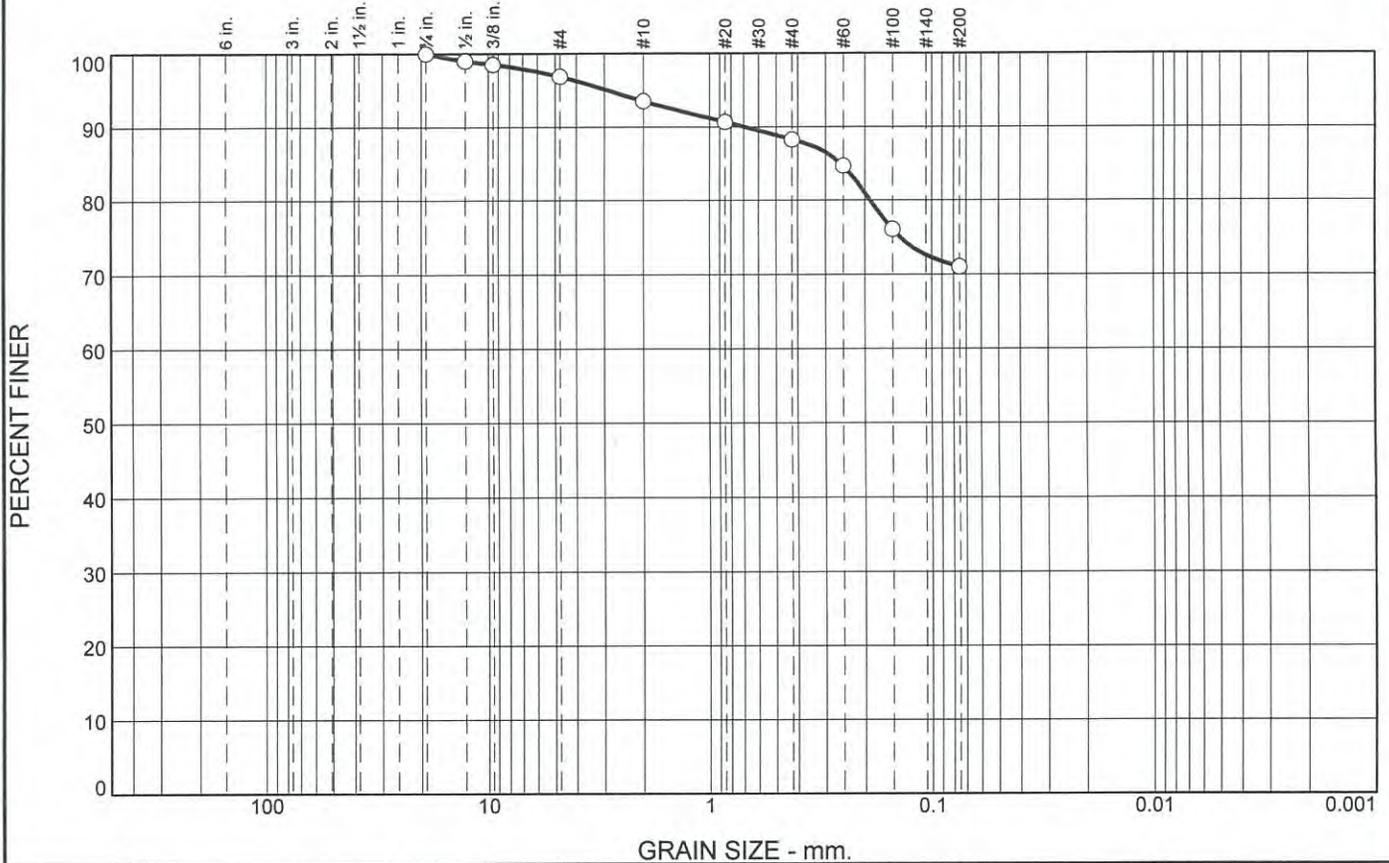
* (no specification provided)

Location: Howards Bay Sample Number: HB17-04 Date: 07/24/2017

JLT Laboratories, Inc. Canonsburg, PA	Client: ARCADIS-US Project: Howards Bay Treatment Study ARCADIS Project ID: 16935001.0000.00001 Project No: 17LS3573.01 Figure
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Tested By: MS Checked By: JB

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.1	3.4	5.2	17.3	71.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.50	99.0		
0.375	98.5		
#4	96.9		
#10	93.5		
#20	90.7		
#40	88.3		
#60	84.7		
#100	76.1		
#200	71.0		

Material Description

Atterberg Limits
 PL= 44 LL= 52 PI= 8

Coefficients
 D₉₀= 0.6936 D₈₅= 0.2563 D₆₀=
 D₅₀= D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Classification
 USCS= AASHTO=

Remarks

* (no specification provided)

Location: Howards Bay
 Sample Number: HB17-05

Date: 07/24/2017

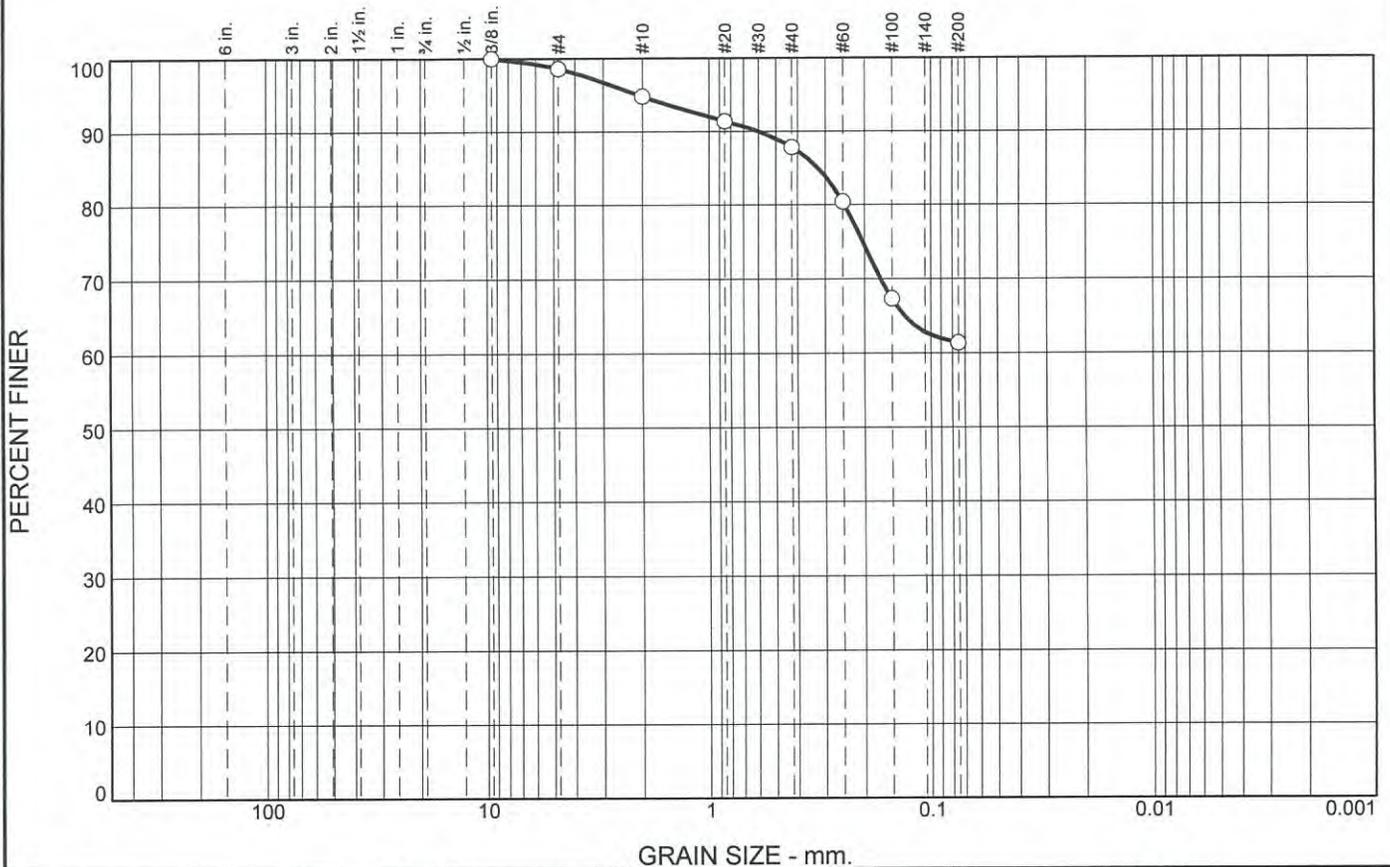
JLT Laboratories, Inc. Canonsburg, PA	Client: ARCADIS-US Project: Howards Bay Treatment Study ARCADIS Project ID: 16935001.0000.00001 Project No: 17LS3573.01
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Figure

Tested By: MS

Checked By: JB

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.4	3.8	7.0	26.4	61.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375	100.0		
#4	98.6		
#10	94.8		
#20	91.4		
#40	87.8		
#60	80.4		
#100	67.4		
#200	61.4		

Material Description

PL= 33 **Atterberg Limits** LL= 47 PI= 14

Coefficients

D₉₀= 0.6012 D₈₅= 0.3233 D₆₀=

D₅₀= D₃₀= D₁₅=

D₁₀= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

* (no specification provided)

Location: Howards Bay
Sample Number: HB17-06

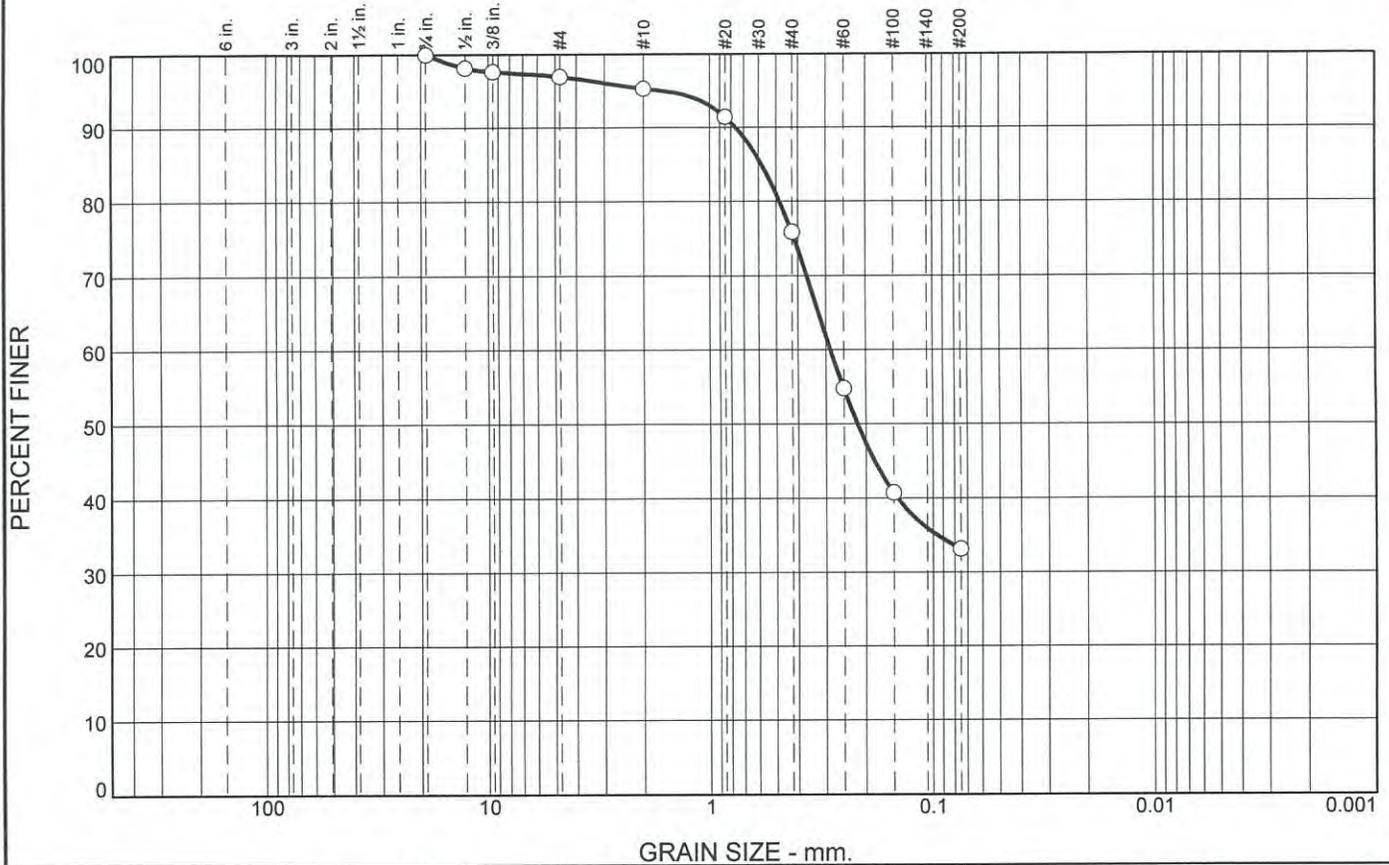
Date: 07/24/2017

<p>JLT Laboratories, Inc.</p> <p>Canonsburg, PA</p>	<p>Client: ARCADIS-US</p> <p>Project: Howards Bay Treatment Study ARCADIS Project ID: 16935001.0000.00001</p> <p>Project No: 17LS3573.01 Figure</p>
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Tested By: MS

Checked By: JB

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.0	1.7	19.4	42.7	33.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.50	98.2		
0.375	97.7		
#4	97.0		
#10	95.3		
#20	91.5		
#40	75.9		
#60	54.8		
#100	40.8		
#200	33.2		

Material Description

Atterberg Limits
 PL= 21 LL= 26 PI= 5

Coefficients
 D₉₀= 0.7590 D₈₅= 0.5811 D₆₀= 0.2856
 D₅₀= 0.2171 D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Classification
 USCS= AASHTO=

Remarks

* (no specification provided)

Location: Howards Bay
 Sample Number: HB17-07

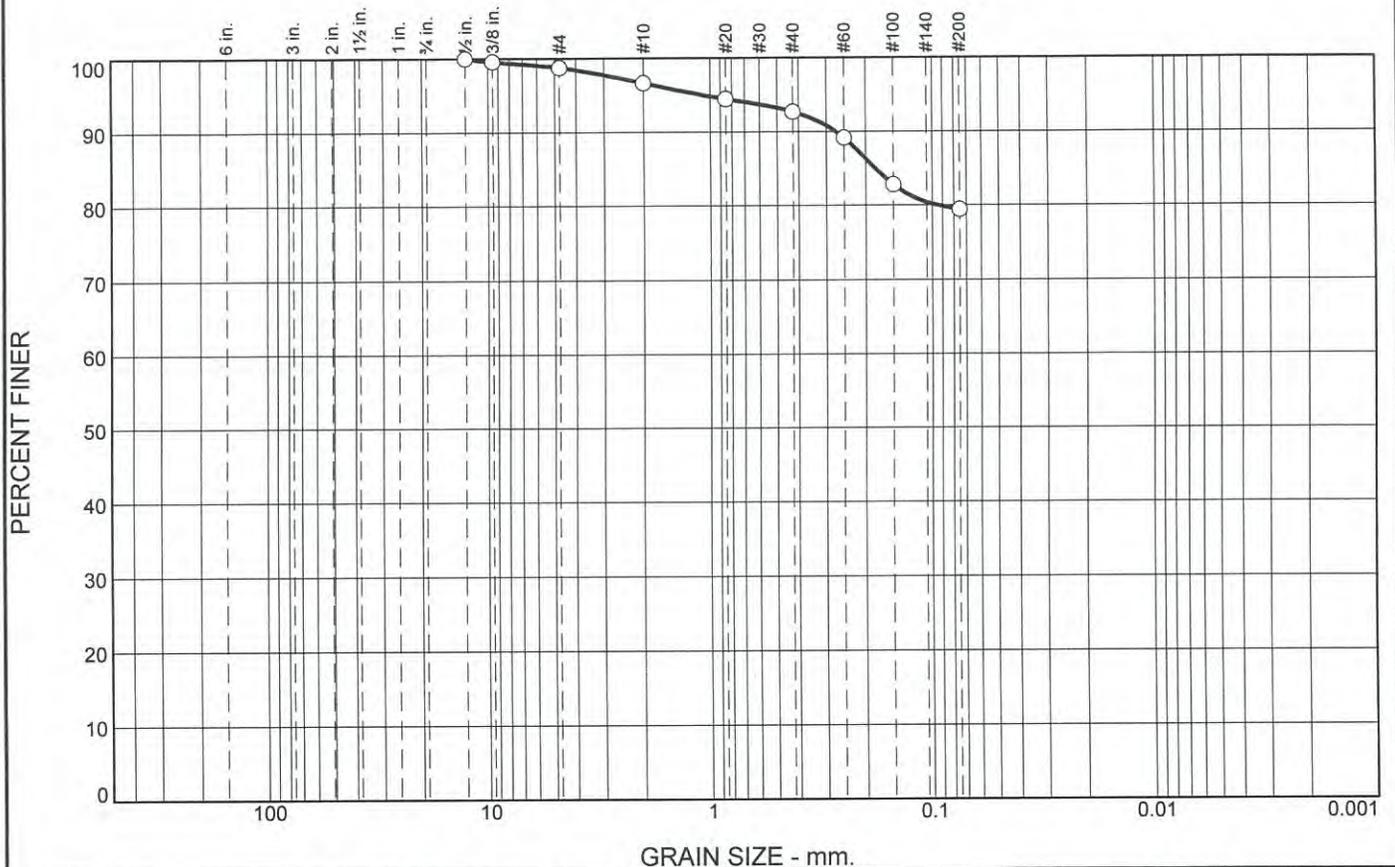
Date: 07/24/2017

JLT Laboratories, Inc. Canonsburg, PA	Client: ARCADIS-US Project: Howards Bay Treatment Study ARCADIS Project ID: 16935001.0000.00001 Project No: 17LS3573.01
	Figure

Tested By: MS

Checked By: JB

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.2	2.2	3.9	13.2	79.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.50	100.0		
0.375	99.6		
#4	98.8		
#10	96.6		
#20	94.5		
#40	92.7		
#60	89.2		
#100	82.8		
#200	79.5		

Material Description

PL= 40 **Atterberg Limits** LL= 56 PI= 16

Coefficients

D₉₀= 0.2714 D₈₅= 0.1805 D₆₀=
D₅₀= D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

* (no specification provided)

Location: Howards Bay
Sample Number: HB17-08

Date: 07/24/2017

JLT Laboratories, Inc. Canonsburg, PA	Client: ARCADIS-US Project: Howards Bay Treatment Study ARCADIS Project ID: 16935001.0000.00001 Project No: 17LS3573.01 Figure
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Tested By: MS

Checked By: JB

COMPACTION TEST REPORT

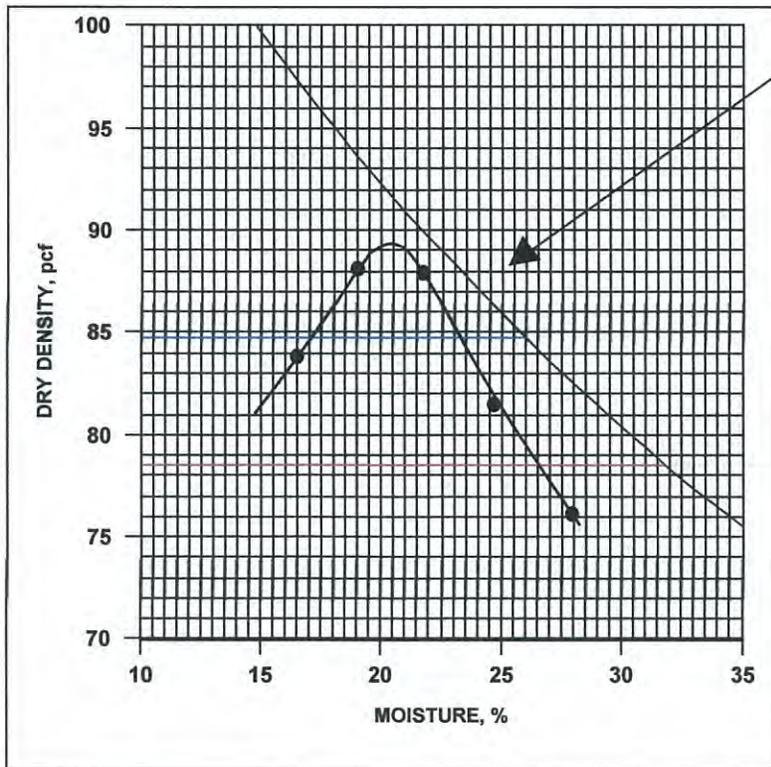


CLIENT : ARCADIS
 PROJECT : Howard's Bay
 MATERIAL : Organic Sediments
 SOURCE : Bucket Sample
 HB17-03

JOB NO 17LS3573.01
 DATE 07/24/2017
 Tested By MS
 Calc'd By JBjr.

METHOD	ASTM	Mold	Hammer	Drop	Layers	Rock Cor.	Technique	Calibration
	D698-A	4"	5.5 lbs	12"	3/25	No	Auto Hammer	03-12-17

	1	2	3	4	5	6	7	8
MOLD+WETSOIL, gr	5879	5912	5830	5766	5769			
MOLD, gr	4291	4291	4291	4291	4291			
WET SOIL, gr	1588	1621	1539	1475	1478			
WET DENSITY, pcf	104.93	107.11	101.70	97.47	97.67			
Tare ID	P-33	SX-701	B-2	P-53	B-27			
WET + TARE, gr	1646.9	1700.7	1635.5	1645.2	1605.3			
DRY + TARE, gr	1268.8	1338.5	1322.4	1387.8	1395.3			
TARE, gr	96.7	103.5	106.6	189.7	122.4			
DRY SOIL, gr	1172.1	1235.0	1215.8	1198.1	1272.9			
WATER, gr	378.1	362.2	313.1	257.4	210.0			
MOISTURE	0.323	0.293	0.258	0.215	0.165			
MOISTURE, %	19.00	21.70	24.70	27.90	16.50			
DRY DENSITY, pcf	88.18	88.02	81.55	76.21	83.83			



Zero Air Voids
 SG = 2.1

As-Received Moisture Content
 122.0 %

Maximum Dry Density
 89.2 pcf

Optimum Moisture Content
 20.5 %

95% of Max. Density
 84.7 pcf

88% of Max. Density
 78.5 pcf

Atterberg Limits		
LL	NP	%
PL	NP	%
PI	NP	%

Classification : Organic Silt

COMPACTION TEST REPORT

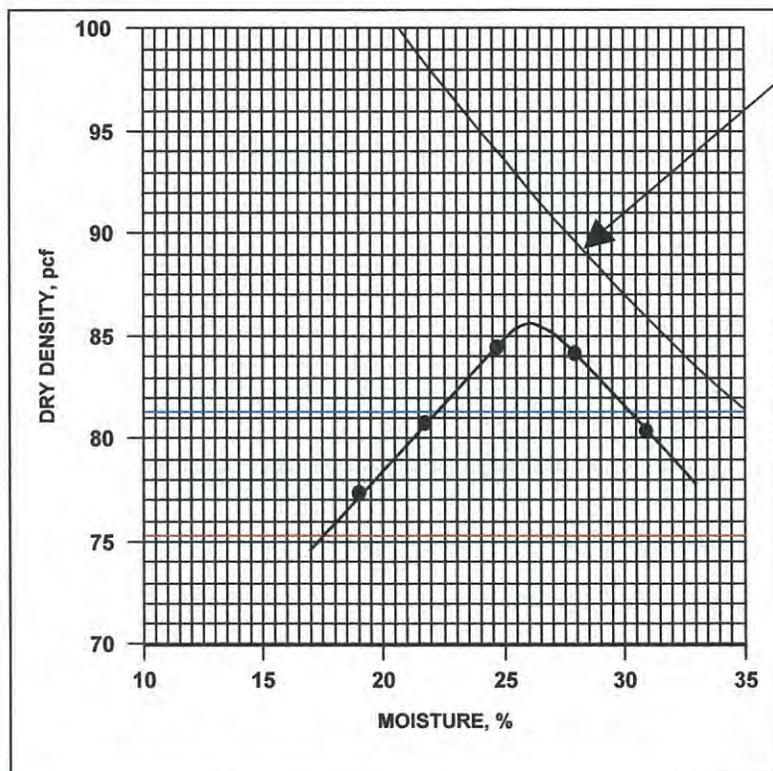


CLIENT : ARCADIS
 PROJECT : Howard's Bay
 MATERIAL : Organic Sediments
 SOURCE : Bucket Sample
 HB17-05

JOB NO 17LS3573.01
 DATE 07/26/2017
 Tested By MS
 Calc'd By JBjr.

METHOD	ASTM D698-A	Mold 4"	Hammer 5.5 lbs	Drop 12"	Layers 3/25	Rock Cor. No	Technique Auto Hammer	Calibration 03-12-17
--------	----------------	------------	-------------------	-------------	----------------	-----------------	--------------------------	-------------------------

	1	2	3	4	5	6	7	8
MOLD+WETSOIL, gr	5685	5779	5885	5922	5885			
MOLD, gr	4291	4291	4291	4291	4291			
WET SOIL, gr	1394	1488	1594	1631	1594			
WET DENSITY, pcf	92.11	98.33	105.33	107.78	105.33			
Tare ID	B-17	P-51	B-9	P-127	B-14			
WET + TARE, gr	1484.5	1632.1	1645.9	1701.2	1721.4			
DRY + TARE, gr	1252.3	1367.8	1314.2	1339.7	1339.7			
TARE, gr	108.4	185.8	102.3	102.8	105.2			
DRY SOIL, gr	1143.9	1182.0	1211.9	1236.9	1234.5			
WATER, gr	232.2	264.3	331.7	361.5	381.7			
MOISTURE	0.203	0.224	0.274	0.292	0.309			
MOISTURE, %	19.00	21.70	24.70	27.90	30.92			
DRY DENSITY, pcf	77.41	80.79	84.47	84.27	80.45			



Zero Air Voids
 SG = 2.4

As-Received Moisture Content
106.0 %

Maximum Dry Density
85.6 pcf

Optimum Moisture Content
26.2 %

95% of Max. Density
81.3 pcf

88% of Max. Density
75.3 pcf

Atterberg Limits		
LL	NP	%
PL	NP	%
PI	NP	%

Classification : Organic Silt

COMPACTION TEST REPORT

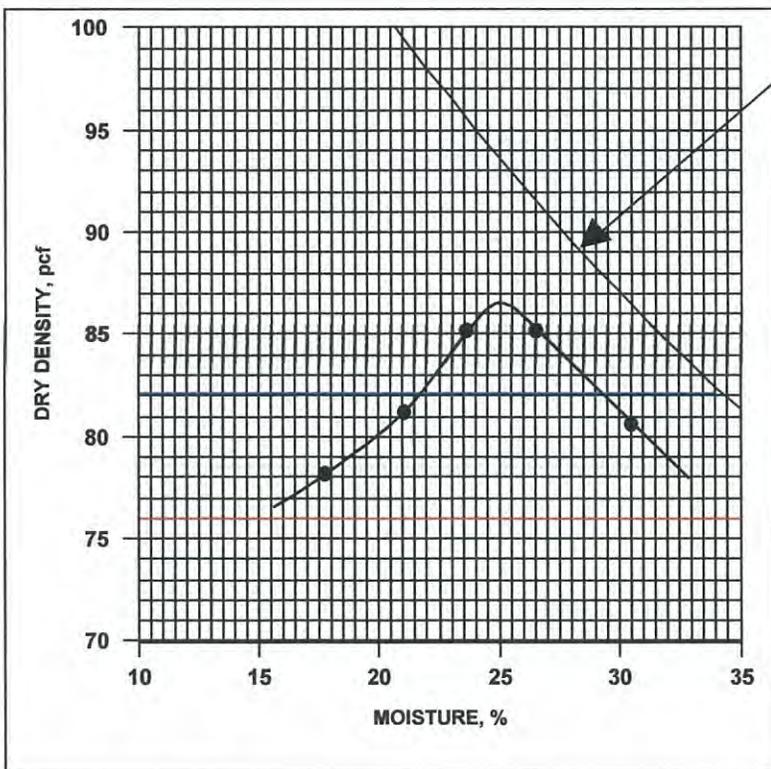


CLIENT : ARCADIS
 PROJECT : Howard's Bay
 MATERIAL : Organic Sediments
 SOURCE : Bucket Sample
 HB17-06

JOB NO 17LS3573.01
 DATE 07/26/2017
 Tested By MS
 Calc'd By JBjr.

METHOD	ASTM D698-A	Mold 4"	Hammer 5.5 lbs	Drop 12"	Layers 3/25	Rock Cor. No	Technique Auto Hammer	Calibration 03-12-17
--------	----------------	------------	-------------------	-------------	----------------	-----------------	--------------------------	-------------------------

	1	2	3	4	5	6	7	8
MOLD+WETSOIL, gr	5685	5779	5885	5922	5885			
MOLD, gr	4291	4291	4291	4291	4291			
WET SOIL, gr	1394	1488	1594	1631	1594			
WET DENSITY, pcf	92.11	98.33	105.33	107.78	105.33			
Tare ID	R-24	P-66	B-32	B-47	B-88			
WET + TARE, gr	1439.7	1589.4	1612.9	1712.2	1722.4			
DRY + TARE, gr	1239.8	1332.0	1326.5	1376.4	1344.9			
TARE, gr	110.4	106.9	113.2	109.4	107.2			
DRY SOIL, gr	1129.4	1225.1	1213.3	1267.0	1237.7			
WATER, gr	199.9	257.4	286.4	335.8	377.5			
MOISTURE	0.177	0.210	0.236	0.265	0.305			
MOISTURE, %	17.70	21.01	23.61	26.50	30.50			
DRY DENSITY, pcf	78.26	81.25	85.22	85.20	80.71			



Zero Air Voids
 SG = 2.4

As-Received Moisture Content
79.0 %

Maximum Dry Density
86.4 pcf

Optimum Moisture Content
25.0 %

95% of Max. Density
82.1 pcf

88% of Max. Density
76.0 pcf

Atterberg Limits		
LL	NP	%
PL	NP	%
PI	NP	%

Classification : Organic Silt

STEP 4



COMPACTION TEST REPORT

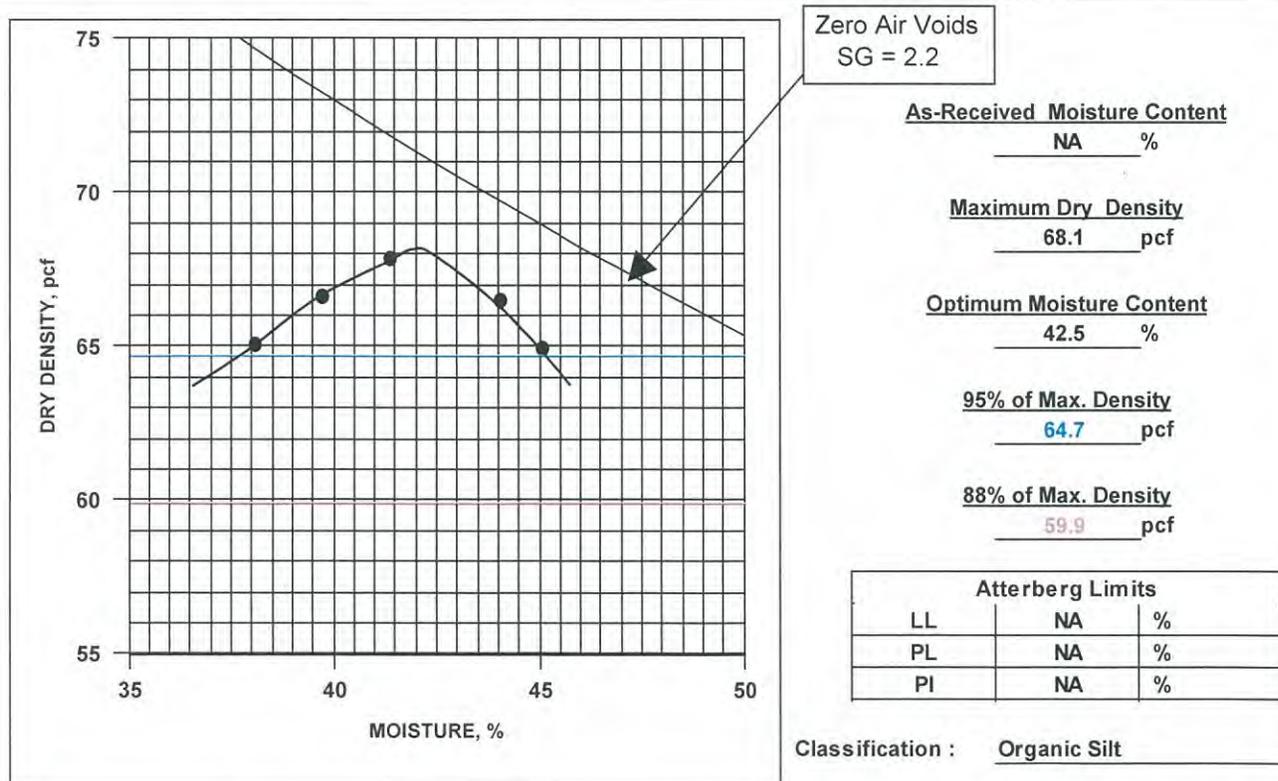


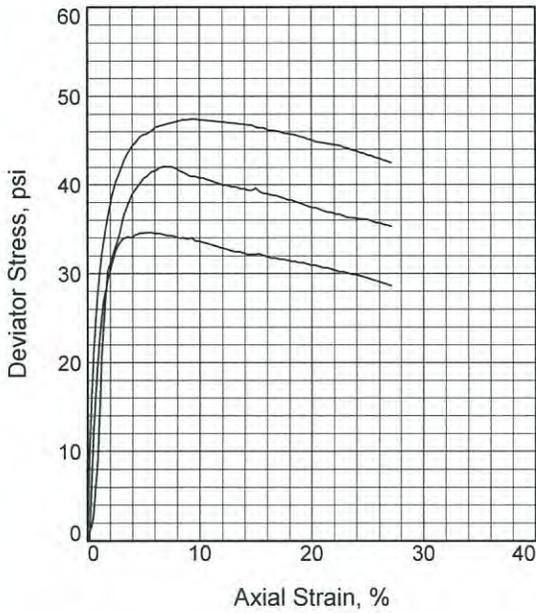
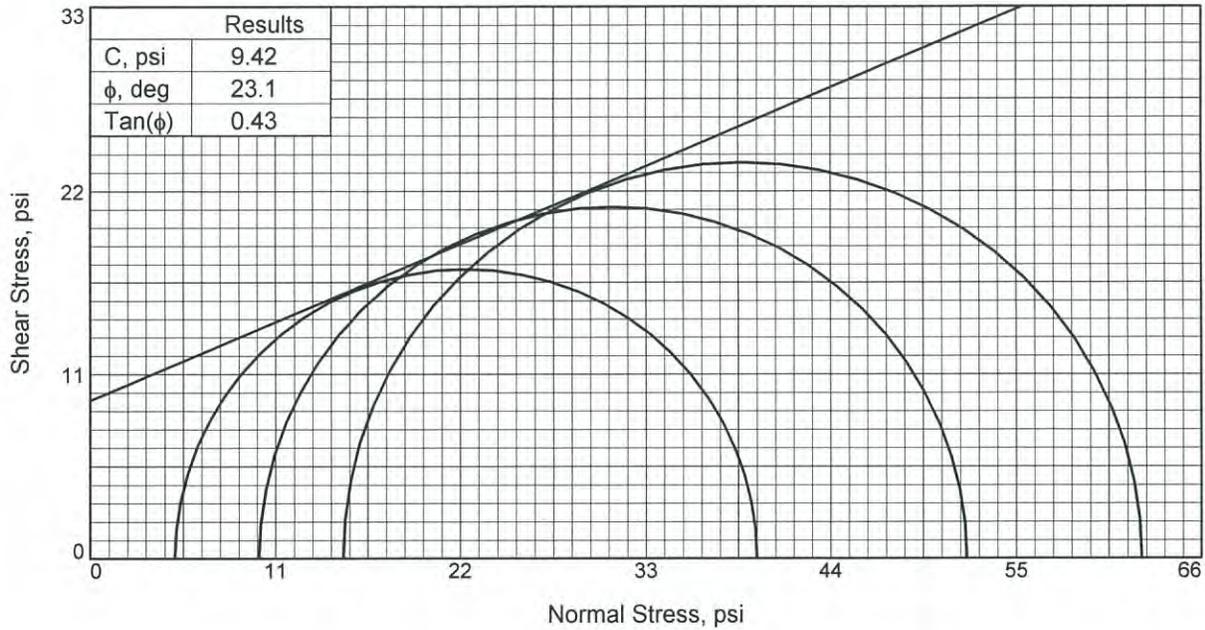
CLIENT : ARCADIS
 PROJECT : 16935001.0000.00013
 MATERIAL : Organic Sediments
 SOURCE : Bucket Sample Step 4 Mix 1

JOB NO 17LS3608.01
 DATE 10/02/2017
 Tested By MS
 Calc 'd By JBjr.

METHOD	ASTM	Mold	Hammer	Drop	Layers	Rock Cor.	Technique	Calibration
	D698-A	4"	5.5 lbs	12"	3/25	No	Auto Hammer	08-12-17

	1	2	3	4	5	6	7	8
MOLD+WETSOIL, gr	5651	5700	5740	5742	5716			
MOLD, gr	4290	4290	4290	4290	4290			
WET SOIL, gr	1361	1410	1450	1452	1426			
WET DENSITY, pcf	89.93	93.17	95.81	95.95	94.23			
Tare ID	P-47	W-2	P-43	P-49	W-35			
WET + TARE, gr	1514.4	1582.9	1584.6	1589.2	1559.4			
DRY + TARE, gr	1147.8	1188.0	1157.6	1177.8	1135.1			
TARE, gr	185.6	193.7	187.8	183.5	193.8			
DRY SOIL, gr	962.2	994.3	969.8	994.3	941.3			
WATER, gr	366.6	394.9	427.0	411.4	424.3			
MOISTURE	0.381	0.397	0.440	0.414	0.451			
MOISTURE, %	38.10	39.72	44.03	41.38	45.08			
DRY DENSITY, pcf	65.12	66.69	66.52	67.87	64.95			





Sample No.	1	2	3	
Initial	Water Content,	42.5	42.5	42.5
	Dry Density, pcf	64.8	64.9	64.8
	Saturation,	83.4	83.7	83.4
	Void Ratio	1.1210	1.1178	1.1203
	Diameter, in.	2.800	2.800	2.800
	Height, in.	5.600	5.600	5.600
At Test	Water Content,	42.5	42.5	42.5
	Dry Density, pcf	64.8	64.9	64.8
	Saturation,	83.4	83.7	83.4
	Void Ratio	1.1210	1.1178	1.1203
	Diameter, in.	2.800	2.800	2.800
	Height, in.	5.600	5.600	5.600
Strain rate, in./min.	0.002	0.002	0.002	
Back Pressure, psi	0.0	0.0	0.0	
Cell Pressure, psi	5.0	10.0	15.0	
Fail. Stress, psi	34.6	42.1	47.4	
Strain, %	5.7	6.8	9.3	
Ult. Stress, psi				
Strain, %				
σ_1 Failure, psi	39.6	52.1	62.4	
σ_3 Failure, psi	5.0	10.0	15.0	

Type of Test:
Unconsolidated Undrained
Sample Type: Recompacted Samples
Description:

Specific Gravity= 2.2
Remarks: ASTM D-2850

Figure Step4Mix1

Client: ARCADIS-US

Project: Howards Bay Treatment Study
ARCADIS Project ID: 16935001.0000.00001

Location: Howards Bay

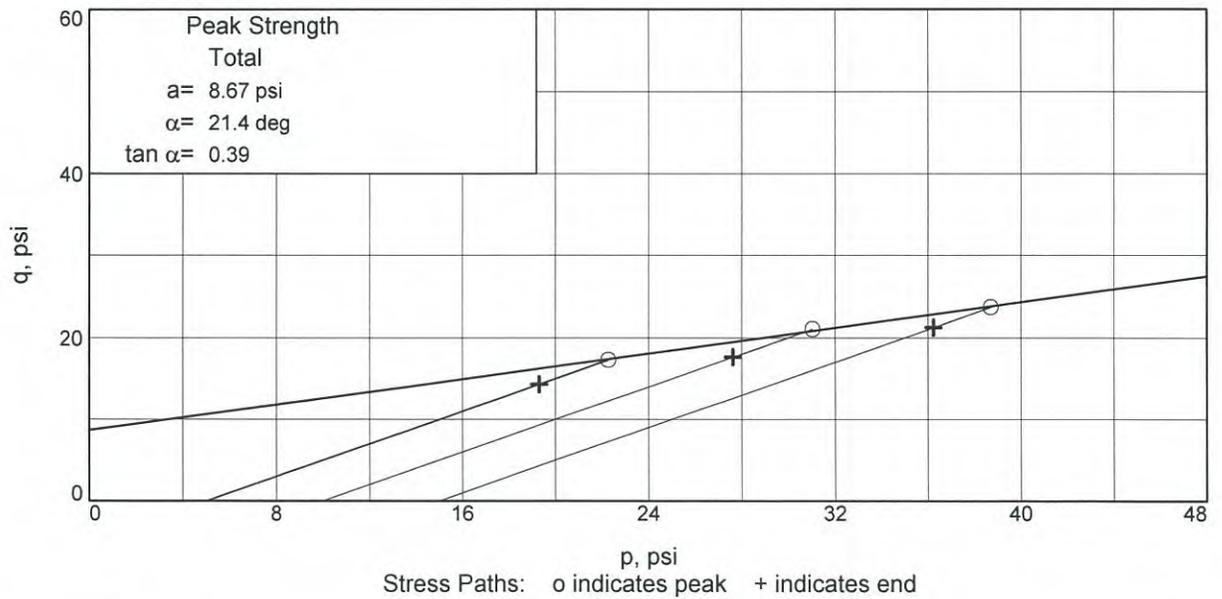
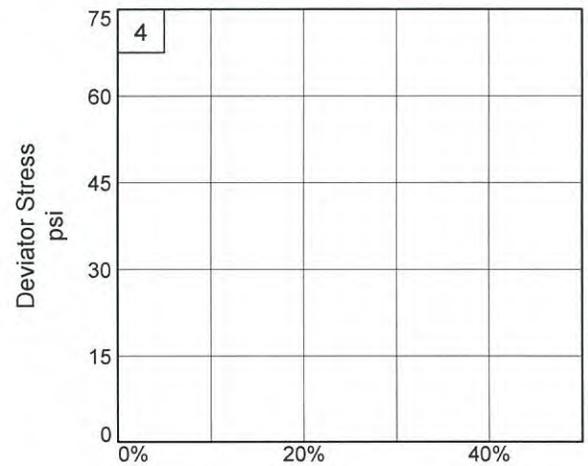
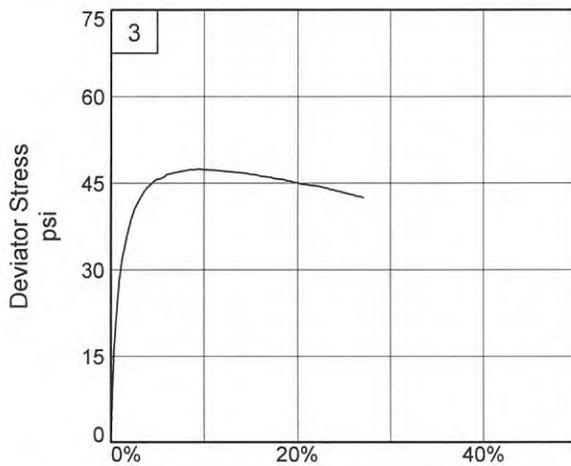
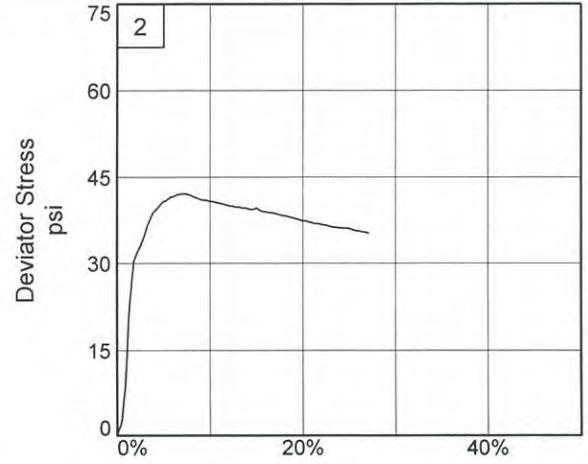
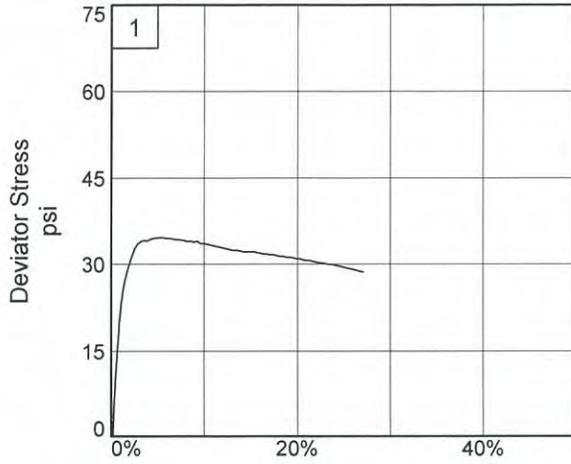
Sample Number: Step 4 Mix 1

Proj. No.: 17LS3608.01

Date: 10/05/2017

TRIAXIAL SHEAR TEST REPORT

JLT Laboratories, Inc.



Client: ARCADIS-US

Project: Howards Bay Treatment Study

Location: Howards Bay

Sample Number: Step 4 Mix 1

Project No.: 17LS3608.01

Figure: Step4Mix1

JLT Laboratories, Inc.

Tested By: MS

Checked By: JB

COMPACTION TEST REPORT

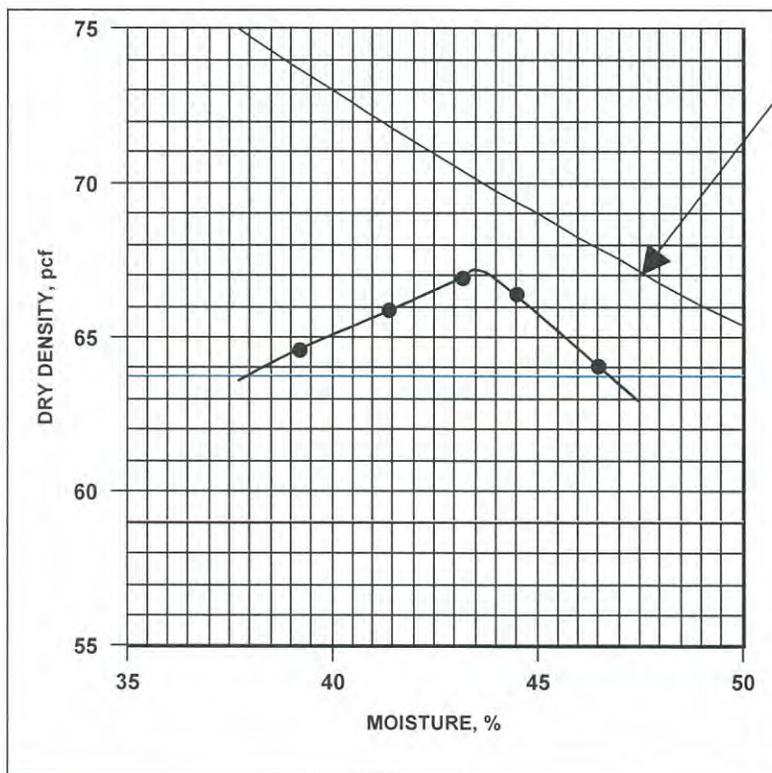


CLIENT : ARCADIS
 PROJECT : 16935001.0000.00013
 MATERIAL : Organic Sediments
 SOURCE : Bucket Sample Step 4 Mix 2

JOB NO 17LS3608.01
 DATE 10/02/2017
 Tested By MS
 Calc 'd By JBjr.

METHOD	ASTM D698-A	Mold 4"	Hammer 5.5 lbs	Drop 12"	Layers 3/25	Rock Cor. No	Technique Auto Hammer	Calibration 08-12-17
--------	----------------	------------	-------------------	-------------	----------------	-----------------	--------------------------	-------------------------

	1	2	3	4	5	6	7	8
MOLD+WETSOIL, gr	5651	5700	5740	5742	5711			
MOLD, gr	4290	4290	4290	4290	4290			
WET SOIL, gr	1361	1410	1450	1452	1421			
WET DENSITY, pcf	89.93	93.17	95.81	95.95	93.90			
Tare ID	P-13	B-88	B-79	B-41	B-67			
WET + TARE, gr	1514.3	1582.9	1584.6	1589.2	1559.4			
DRY + TARE, gr	1117.6	1153.5	1141.2	1135.2	1100.4			
TARE, gr	105.6	116.2	114.8	114.9	113.2			
DRY SOIL, gr	1012.0	1037.3	1026.4	1020.3	987.2			
WATER, gr	396.7	429.4	443.4	454.0	459.0			
MOISTURE	0.392	0.414	0.432	0.445	0.465			
MOISTURE, %	39.20	41.40	43.20	44.50	46.50			
DRY DENSITY, pcf	64.61	65.89	66.91	66.40	64.10			



Zero Air Voids
 SG = 2.2

As-Received Moisture Content

NA %

Maximum Dry Density

67.1 pcf

Optimum Moisture Content

43.5 %

95% of Max. Density

63.7 pcf

88% of Max. Density

59.0 pcf

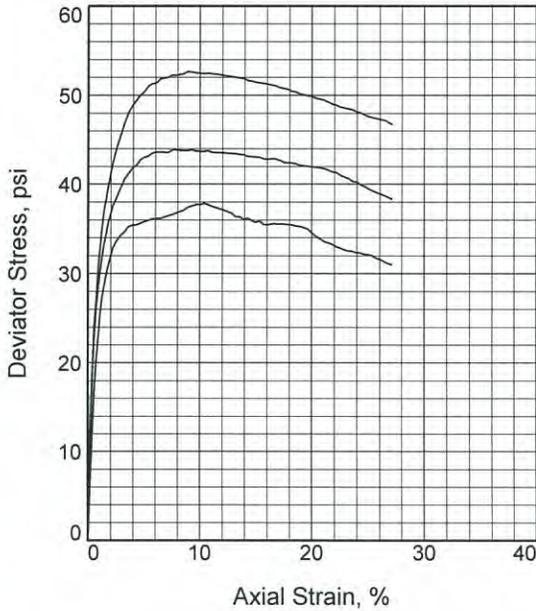
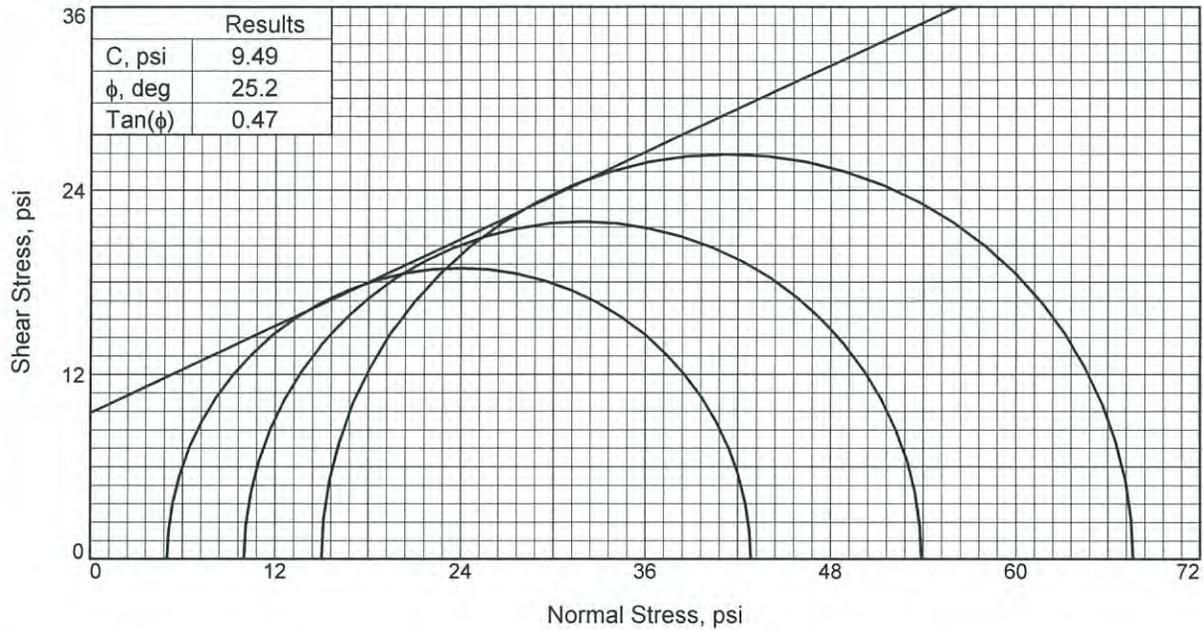
Atterberg Limits

LL NA %

PL NA %

PI NA %

Classification : Organic Silt



Sample No.	1	2	3	
Initial	Water Content,	43.8	43.8	44.8
	Dry Density, pcf	63.6	63.7	63.4
	Saturation,	83.2	83.3	84.4
	Void Ratio	1.1582	1.1563	1.1672
	Diameter, in.	2.800	2.800	2.800
	Height, in.	5.600	5.600	5.600
At Test	Water Content,	43.8	43.8	44.8
	Dry Density, pcf	63.6	63.7	63.4
	Saturation,	83.2	83.3	84.4
	Void Ratio	1.1582	1.1563	1.1672
	Diameter, in.	2.800	2.800	2.800
	Height, in.	5.600	5.600	5.600
Strain rate, in./min.	0.002	0.002	0.002	
Back Pressure, psi	0.0	0.0	0.0	
Cell Pressure, psi	5.0	10.0	15.0	
Fail. Stress, psi	37.9	43.9	52.7	
Strain, %	10.4	9.3	8.9	
Ult. Stress, psi				
Strain, %				
σ_1 Failure, psi	42.9	53.9	67.7	
σ_3 Failure, psi	5.0	10.0	15.0	

Type of Test:

Unconsolidated Undrained

Sample Type: Recompacted Samples

Description:

Specific Gravity= 2.20

Remarks: ASTM D-2850

Client: ARCADIS-US

Project: Howards Bay Treatment Study

ARCADIS Project ID: 16935001.0000.00001

Location: Howards Bay

Sample Number: Step 4 Mix 2

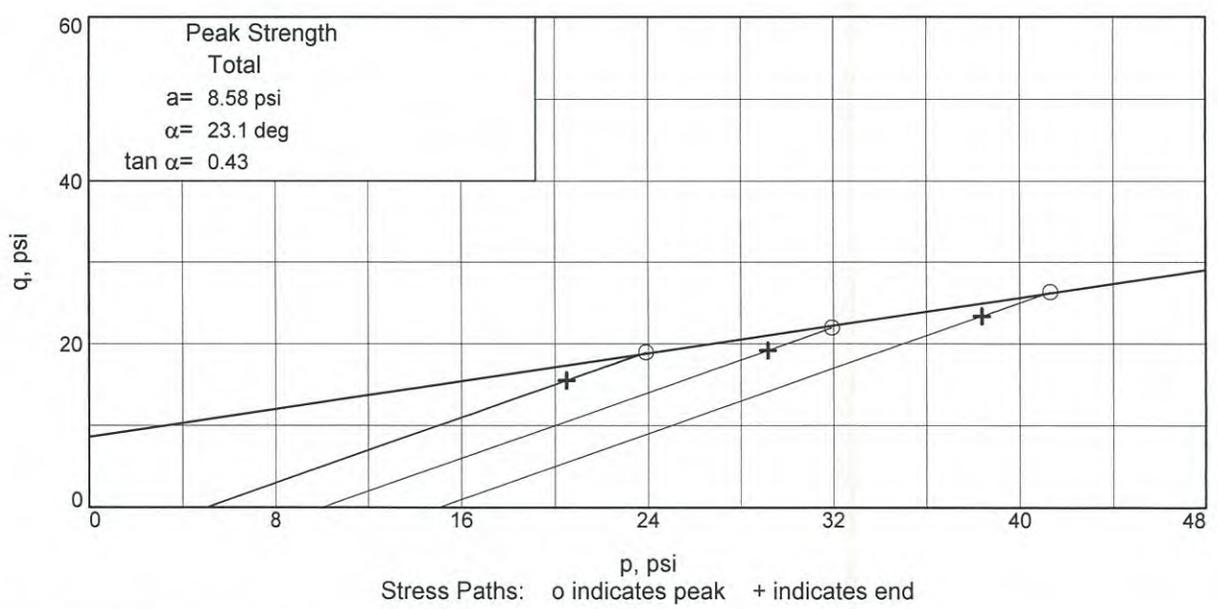
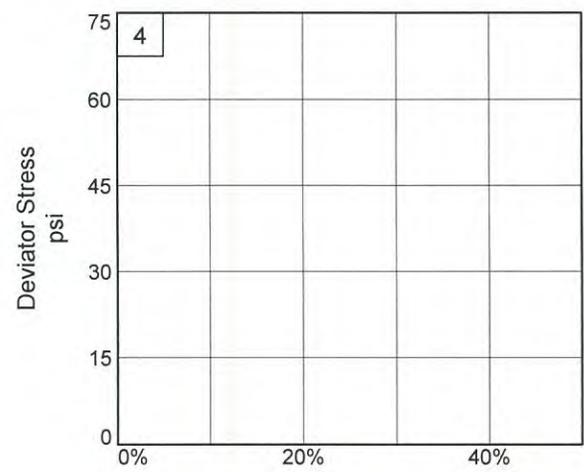
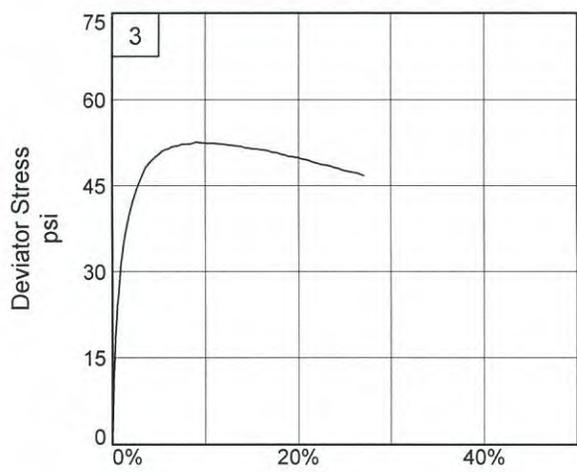
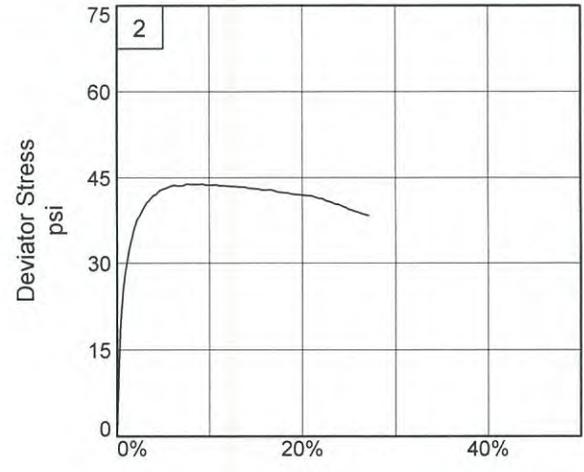
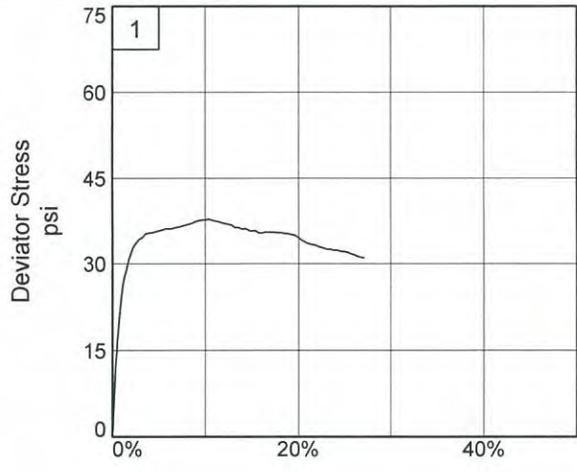
Proj. No.: 17LS3608.01

Date: 10/06/2017

TRIAxIAL SHEAR TEST REPORT

JLT Laboratories, Inc.

Figure Step4Mix2



Client: ARCADIS-US
Project: Howards Bay Treatment Study
Location: Howards Bay **Sample Number:** Step 4 Mix 2
Project No.: 17LS3608.01 **Figure:** Step4Mix2

JLT Laboratories, Inc.

Tested By: MS **Checked By:** JB

ATTACHMENT 4

Chemical Laboratory Data



STEP 1 - GENERAL



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-82391-1
Client Project/Site: Howard's Bay

For:
ARCADIS U.S. Inc
4915 Prospectus Drive
Suite F
Durham, North Carolina 27713

Attn: Andy Baumeister



Authorized for release by:
8/10/2017 5:00:50 PM

Leslie Howell, Project Manager I
(330)497-9396
leslie.howell@testamericainc.com

LINKS

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results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

- 1
- 2
- 3
- 4
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- 6
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Definitions/Glossary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
*	RPD of the LCS and LCSD exceeds the control limits
cn	Refer to Case Narrative for further detail

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Job ID: 240-82391-1

Laboratory: TestAmerica Canton

Narrative

Job Narrative 240-82391-1

Comments

No additional comments.

Receipt

The samples were received on 7/15/2017 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.1° C.

GC/MS Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA

Method(s) Organotins/GC: The laboratory control sample and/or the laboratory control sample duplicate (LCS/LCSD) for preparation batch 200-119049 and analytical batch 200-119464 recovered outside control limits for the following analyte(s): Monobutyltin. Monobutyltin has been identified as a poor performing analyte when analyzed using this method; therefore, re-extraction/re-analysis was not performed. The laboratory control limits are not based on historical performance and do not indicate expected performance of this analyte by this method. The laboratory does not use the performance of Monobutyltin as the basis for acceptance of the analytical batch. All analytical results, both detects and non-detects, are considered qualitative and are therefore flagged with a "cn" qualifier. The affected samples include: HB17-07 (240-82391-7).

Method(s) Organotins/GC: The following samples were analyzed using the RTX-35 column. The target analytes were not detected in the analysis, therefore the confirmation column was not analyzed. The data has been reported.
HB17-07 (240-82391-7)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Method	Method Description	Protocol	Laboratory
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN
Organotins/GC	Organotins (GC/FPD)	TestAmerica SOP	TAL BUR
6010C	Metals (ICP)	SW846	TAL CAN
7471B	Mercury (CVAA)	SW846	TAL CAN
2320B-1997	Alkalinity, Total	SM	TAL CAN
2340C-1997	Hardness, Total	SM	TAL CAN
9056A	Anions, Ion Chromatography	SW846	TAL CAN
Moisture	Percent Moisture	EPA	TAL CAN

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TestAmerica SOP = TestAmerica, Inc., Standard Operating Procedure

Laboratory References:

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-82391-1	HB17-01	Solid	07/14/17 14:30	07/15/17 09:40
240-82391-2	HB17-02	Solid	07/14/17 14:30	07/15/17 09:40
240-82391-3	HB17-03	Solid	07/14/17 14:30	07/15/17 09:40
240-82391-4	HB17-04	Solid	07/14/17 14:30	07/15/17 09:40
240-82391-5	HB17-05	Solid	07/14/17 14:30	07/15/17 09:40
240-82391-6	HB17-06	Solid	07/14/17 14:30	07/15/17 09:40
240-82391-7	HB17-07	Solid	07/14/17 14:30	07/15/17 09:40
240-82391-8	HB17-08	Solid	07/14/17 14:30	07/15/17 09:40



Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-01

Lab Sample ID: 240-82391-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	36		12	1.4	ug/Kg	1	☼	8270D	Total/NA
Acenaphthylene	16		12	0.66	ug/Kg	1	☼	8270D	Total/NA
Anthracene	69		12	1.5	ug/Kg	1	☼	8270D	Total/NA
Benzo[a]anthracene	140		12	1.2	ug/Kg	1	☼	8270D	Total/NA
Benzo[a]pyrene	140		12	1.2	ug/Kg	1	☼	8270D	Total/NA
Benzo[b]fluoranthene	210		12	1.1	ug/Kg	1	☼	8270D	Total/NA
Benzo[g,h,i]perylene	110		12	0.66	ug/Kg	1	☼	8270D	Total/NA
Benzo[k]fluoranthene	87		12	1.3	ug/Kg	1	☼	8270D	Total/NA
Chrysene	190		12	2.1	ug/Kg	1	☼	8270D	Total/NA
Dibenz(a,h)anthracene	22		12	1.2	ug/Kg	1	☼	8270D	Total/NA
Fluoranthene	350		12	1.0	ug/Kg	1	☼	8270D	Total/NA
Fluorene	52		12	0.99	ug/Kg	1	☼	8270D	Total/NA
Indeno[1,2,3-cd]pyrene	95		12	0.66	ug/Kg	1	☼	8270D	Total/NA
Naphthalene	56		12	1.5	ug/Kg	1	☼	8270D	Total/NA
Phenanthrene	210		12	1.4	ug/Kg	1	☼	8270D	Total/NA
Pyrene	260		12	0.82	ug/Kg	1	☼	8270D	Total/NA
Tributyltin	3.7		2.8	2.8	ug/Kg	1	☼	Organotins/GC	Total/NA
Barium	85		37	0.75	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.30	J	0.92	0.039	mg/Kg	1	☼	6010C	Total/NA
Chromium	23		1.8	0.14	mg/Kg	1	☼	6010C	Total/NA
Arsenic	5.2		2.8	0.75	mg/Kg	1	☼	6010C	Total/NA
Lead	33		1.8	0.37	mg/Kg	1	☼	6010C	Total/NA
Hg	0.13	J	0.19	0.034	mg/Kg	1	☼	7471B	Total/NA
Chloride	9.2	J	19	4.4	mg/Kg	1	☼	9056A	Soluble
Alkalinity	60	B	5.0	2.6	mg/L	1		2320B-1997	ASTM Leach
Hardness as calcium carbonate	72		5.0	2.4	mg/L	1		2340C-1997	ASTM Leach

Client Sample ID: HB17-02

Lab Sample ID: 240-82391-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	88		12	1.4	ug/Kg	1	☼	8270D	Total/NA
Acenaphthylene	16		12	0.64	ug/Kg	1	☼	8270D	Total/NA
Anthracene	210		12	1.4	ug/Kg	1	☼	8270D	Total/NA
Benzo[a]anthracene	320		12	1.1	ug/Kg	1	☼	8270D	Total/NA
Benzo[a]pyrene	290		12	1.2	ug/Kg	1	☼	8270D	Total/NA
Benzo[b]fluoranthene	340		12	1.1	ug/Kg	1	☼	8270D	Total/NA
Benzo[g,h,i]perylene	120		12	0.64	ug/Kg	1	☼	8270D	Total/NA
Benzo[k]fluoranthene	140		12	1.2	ug/Kg	1	☼	8270D	Total/NA
Chrysene	310		12	2.0	ug/Kg	1	☼	8270D	Total/NA
Dibenz(a,h)anthracene	34		12	1.2	ug/Kg	1	☼	8270D	Total/NA
Fluoranthene	840		12	1.0	ug/Kg	1	☼	8270D	Total/NA
Fluorene	120		12	0.96	ug/Kg	1	☼	8270D	Total/NA
Indeno[1,2,3-cd]pyrene	120		12	0.64	ug/Kg	1	☼	8270D	Total/NA
Naphthalene	53		12	1.5	ug/Kg	1	☼	8270D	Total/NA
Phenanthrene	860		12	1.3	ug/Kg	1	☼	8270D	Total/NA
Pyrene	640		12	0.80	ug/Kg	1	☼	8270D	Total/NA
Tributyltin	67		8.3	8.3	ug/Kg	3	☼	Organotins/GC	Total/NA
Barium	50		32	0.65	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.22	J	0.79	0.033	mg/Kg	1	☼	6010C	Total/NA
Chromium	14		1.6	0.12	mg/Kg	1	☼	6010C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-02 (Continued)

Lab Sample ID: 240-82391-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	3.6		2.4	0.65	mg/Kg	1	☒	6010C	Total/NA
Lead	38		1.6	0.32	mg/Kg	1	☒	6010C	Total/NA
Selenium	0.60	J	3.2	0.54	mg/Kg	1	☒	6010C	Total/NA
Hg	0.099	J	0.16	0.029	mg/Kg	1	☒	7471B	Total/NA
Chloride	66		19	4.3	mg/Kg	1	☒	9056A	Soluble
Alkalinity	58	B	5.0	2.6	mg/L	1		2320B-1997	ASTM Leach
Hardness as calcium carbonate	82		5.0	2.4	mg/L	1		2340C-1997	ASTM Leach

Client Sample ID: HB17-03

Lab Sample ID: 240-82391-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	65		14	1.6	ug/Kg	1	☒	8270D	Total/NA
Acenaphthylene	32		14	0.76	ug/Kg	1	☒	8270D	Total/NA
Anthracene	150		14	1.7	ug/Kg	1	☒	8270D	Total/NA
Benzo[a]anthracene	450		14	1.4	ug/Kg	1	☒	8270D	Total/NA
Benzo[a]pyrene	410		14	1.4	ug/Kg	1	☒	8270D	Total/NA
Benzo[b]fluoranthene	540		14	1.3	ug/Kg	1	☒	8270D	Total/NA
Benzo[g,h,i]perylene	280		14	0.76	ug/Kg	1	☒	8270D	Total/NA
Benzo[k]fluoranthene	190		14	1.5	ug/Kg	1	☒	8270D	Total/NA
Chrysene	510		14	2.4	ug/Kg	1	☒	8270D	Total/NA
Dibenz(a,h)anthracene	89		14	1.4	ug/Kg	1	☒	8270D	Total/NA
Fluoranthene	960		14	1.2	ug/Kg	1	☒	8270D	Total/NA
Fluorene	96		14	1.1	ug/Kg	1	☒	8270D	Total/NA
Indeno[1,2,3-cd]pyrene	240		14	0.76	ug/Kg	1	☒	8270D	Total/NA
Naphthalene	180		14	1.8	ug/Kg	1	☒	8270D	Total/NA
Phenanthrene	690		14	1.6	ug/Kg	1	☒	8270D	Total/NA
Pyrene	820		14	0.95	ug/Kg	1	☒	8270D	Total/NA
Barium	140		41	0.84	mg/Kg	1	☒	6010C	Total/NA
Cadmium	1.2		1.0	0.043	mg/Kg	1	☒	6010C	Total/NA
Chromium	32		2.0	0.15	mg/Kg	1	☒	6010C	Total/NA
Silver	0.62	J	2.0	0.13	mg/Kg	1	☒	6010C	Total/NA
Arsenic	6.0		3.1	0.84	mg/Kg	1	☒	6010C	Total/NA
Lead	210		2.0	0.41	mg/Kg	1	☒	6010C	Total/NA
Hg	1.3		0.19	0.034	mg/Kg	1	☒	7471B	Total/NA
Chloride	28		21	5.0	mg/Kg	1	☒	9056A	Soluble
Alkalinity	23	B	5.0	2.6	mg/L	1		2320B-1997	ASTM Leach
Hardness as calcium carbonate	50		5.0	2.4	mg/L	1		2340C-1997	ASTM Leach

Client Sample ID: HB17-04

Lab Sample ID: 240-82391-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	87		13	1.5	ug/Kg	1	☒	8270D	Total/NA
Acenaphthylene	39		13	0.67	ug/Kg	1	☒	8270D	Total/NA
Anthracene	160		13	1.5	ug/Kg	1	☒	8270D	Total/NA
Benzo[a]anthracene	480		13	1.2	ug/Kg	1	☒	8270D	Total/NA
Benzo[a]pyrene	460		13	1.2	ug/Kg	1	☒	8270D	Total/NA
Benzo[b]fluoranthene	630		13	1.1	ug/Kg	1	☒	8270D	Total/NA
Benzo[g,h,i]perylene	370		13	0.67	ug/Kg	1	☒	8270D	Total/NA
Benzo[k]fluoranthene	210		13	1.3	ug/Kg	1	☒	8270D	Total/NA
Chrysene	550		13	2.1	ug/Kg	1	☒	8270D	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-04 (Continued)

Lab Sample ID: 240-82391-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Dibenz(a,h)anthracene	88		13	1.3	ug/Kg	1	☼	8270D	Total/NA
Fluoranthene	1100		13	1.1	ug/Kg	1	☼	8270D	Total/NA
Fluorene	100		13	1.0	ug/Kg	1	☼	8270D	Total/NA
Indeno[1,2,3-cd]pyrene	310		13	0.67	ug/Kg	1	☼	8270D	Total/NA
Naphthalene	190		13	1.6	ug/Kg	1	☼	8270D	Total/NA
Phenanthrene	780		13	1.4	ug/Kg	1	☼	8270D	Total/NA
Pyrene	930		13	0.84	ug/Kg	1	☼	8270D	Total/NA
Barium	100		33	0.68	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.64	J	0.83	0.035	mg/Kg	1	☼	6010C	Total/NA
Chromium	30		1.7	0.13	mg/Kg	1	☼	6010C	Total/NA
Arsenic	5.4		2.5	0.68	mg/Kg	1	☼	6010C	Total/NA
Lead	96		1.7	0.33	mg/Kg	1	☼	6010C	Total/NA
Hg	0.40		0.20	0.035	mg/Kg	1	☼	7471B	Total/NA
Chloride	33		19	4.4	mg/Kg	1	☼	9056A	Soluble
Alkalinity	70	B	5.0	2.6	mg/L	1		2320B-1997	ASTM Leach
Hardness as calcium carbonate	86		5.0	2.4	mg/L	1		2340C-1997	ASTM Leach

Client Sample ID: HB17-05

Lab Sample ID: 240-82391-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	48		14	1.5	ug/Kg	1	☼	8270D	Total/NA
Acenaphthylene	28		14	0.71	ug/Kg	1	☼	8270D	Total/NA
Anthracene	98		14	1.6	ug/Kg	1	☼	8270D	Total/NA
Benzo[a]anthracene	240		14	1.3	ug/Kg	1	☼	8270D	Total/NA
Benzo[a]pyrene	250		14	1.3	ug/Kg	1	☼	8270D	Total/NA
Benzo[b]fluoranthene	330		14	1.2	ug/Kg	1	☼	8270D	Total/NA
Benzo[g,h,i]perylene	170		14	0.71	ug/Kg	1	☼	8270D	Total/NA
Benzo[k]fluoranthene	120		14	1.4	ug/Kg	1	☼	8270D	Total/NA
Chrysene	310		14	2.2	ug/Kg	1	☼	8270D	Total/NA
Dibenz(a,h)anthracene	47		14	1.3	ug/Kg	1	☼	8270D	Total/NA
Fluoranthene	520		14	1.1	ug/Kg	1	☼	8270D	Total/NA
Fluorene	78		14	1.1	ug/Kg	1	☼	8270D	Total/NA
Indeno[1,2,3-cd]pyrene	150		14	0.71	ug/Kg	1	☼	8270D	Total/NA
Naphthalene	170		14	1.7	ug/Kg	1	☼	8270D	Total/NA
Phenanthrene	420		14	1.5	ug/Kg	1	☼	8270D	Total/NA
Pyrene	470		14	0.89	ug/Kg	1	☼	8270D	Total/NA
Barium	140		28	0.57	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.83		0.70	0.029	mg/Kg	1	☼	6010C	Total/NA
Chromium	32		1.4	0.10	mg/Kg	1	☼	6010C	Total/NA
Silver	0.20	J	1.4	0.088	mg/Kg	1	☼	6010C	Total/NA
Arsenic	5.7		2.1	0.57	mg/Kg	1	☼	6010C	Total/NA
Lead	120		1.4	0.28	mg/Kg	1	☼	6010C	Total/NA
Selenium	0.54	J	2.8	0.47	mg/Kg	1	☼	6010C	Total/NA
Hg	0.64		0.17	0.031	mg/Kg	1	☼	7471B	Total/NA
Chloride	42		20	4.7	mg/Kg	1	☼	9056A	Soluble
Alkalinity	46	B	5.0	2.6	mg/L	1		2320B-1997	ASTM Leach
Hardness as calcium carbonate	68		5.0	2.4	mg/L	1		2340C-1997	ASTM Leach

Client Sample ID: HB17-06

Lab Sample ID: 240-82391-6

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-06 (Continued)

Lab Sample ID: 240-82391-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	45		12	1.3	ug/Kg	1	☼	8270D	Total/NA
Acenaphthylene	33		12	0.61	ug/Kg	1	☼	8270D	Total/NA
Anthracene	110		12	1.4	ug/Kg	1	☼	8270D	Total/NA
Benzo[a]anthracene	280		12	1.1	ug/Kg	1	☼	8270D	Total/NA
Benzo[a]pyrene	280		12	1.1	ug/Kg	1	☼	8270D	Total/NA
Benzo[b]fluoranthene	370		12	1.0	ug/Kg	1	☼	8270D	Total/NA
Benzo[g,h,i]perylene	190		12	0.61	ug/Kg	1	☼	8270D	Total/NA
Benzo[k]fluoranthene	150		12	1.2	ug/Kg	1	☼	8270D	Total/NA
Chrysene	350		12	1.9	ug/Kg	1	☼	8270D	Total/NA
Dibenz(a,h)anthracene	52		12	1.1	ug/Kg	1	☼	8270D	Total/NA
Fluoranthene	630		12	0.95	ug/Kg	1	☼	8270D	Total/NA
Fluorene	81		12	0.92	ug/Kg	1	☼	8270D	Total/NA
Indeno[1,2,3-cd]pyrene	170		12	0.61	ug/Kg	1	☼	8270D	Total/NA
Naphthalene	160		12	1.4	ug/Kg	1	☼	8270D	Total/NA
Phenanthrene	480		12	1.3	ug/Kg	1	☼	8270D	Total/NA
Pyrene	540		12	0.76	ug/Kg	1	☼	8270D	Total/NA
Tributyltin	4.5		2.6	2.6	ug/Kg	1	☼	Organotins/GC	Total/NA
Barium	85		24	0.49	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.64		0.60	0.025	mg/Kg	1	☼	6010C	Total/NA
Chromium	33		1.2	0.090	mg/Kg	1	☼	6010C	Total/NA
Silver	0.17	J	1.2	0.076	mg/Kg	1	☼	6010C	Total/NA
Arsenic	5.4		1.8	0.49	mg/Kg	1	☼	6010C	Total/NA
Lead	400		1.2	0.24	mg/Kg	1	☼	6010C	Total/NA
Hg	0.46		0.16	0.029	mg/Kg	1	☼	7471B	Total/NA
Chloride	18		18	4.1	mg/Kg	1	☼	9056A	Soluble
Alkalinity	60	B	5.0	2.6	mg/L	1		2320B-1997	ASTM Leach
Hardness as calcium carbonate	66		5.0	2.4	mg/L	1		2340C-1997	ASTM Leach

Client Sample ID: HB17-07

Lab Sample ID: 240-82391-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	25		8.6	0.98	ug/Kg	1	☼	8270D	Total/NA
Acenaphthylene	53		8.6	0.45	ug/Kg	1	☼	8270D	Total/NA
Anthracene	130		8.6	1.0	ug/Kg	1	☼	8270D	Total/NA
Benzo[a]anthracene	340		8.6	0.82	ug/Kg	1	☼	8270D	Total/NA
Benzo[a]pyrene	330		8.6	0.83	ug/Kg	1	☼	8270D	Total/NA
Benzo[b]fluoranthene	400		8.6	0.76	ug/Kg	1	☼	8270D	Total/NA
Benzo[g,h,i]perylene	200		8.6	0.45	ug/Kg	1	☼	8270D	Total/NA
Benzo[k]fluoranthene	170		8.6	0.88	ug/Kg	1	☼	8270D	Total/NA
Chrysene	330		8.6	1.4	ug/Kg	1	☼	8270D	Total/NA
Dibenz(a,h)anthracene	55		8.6	0.85	ug/Kg	1	☼	8270D	Total/NA
Fluoranthene	940		8.6	0.71	ug/Kg	1	☼	8270D	Total/NA
Fluorene	100		8.6	0.69	ug/Kg	1	☼	8270D	Total/NA
Indeno[1,2,3-cd]pyrene	200		8.6	0.45	ug/Kg	1	☼	8270D	Total/NA
Naphthalene	75		8.6	1.1	ug/Kg	1	☼	8270D	Total/NA
Phenanthrene	850		8.6	0.94	ug/Kg	1	☼	8270D	Total/NA
Pyrene	670		8.6	0.57	ug/Kg	1	☼	8270D	Total/NA
Barium	52		18	0.37	mg/Kg	1	☼	6010C	Total/NA
Cadmium	0.16	J	0.45	0.019	mg/Kg	1	☼	6010C	Total/NA
Chromium	13		0.90	0.067	mg/Kg	1	☼	6010C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-07 (Continued)

Lab Sample ID: 240-82391-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	2.6		1.3	0.37	mg/Kg	1	☼	6010C	Total/NA
Lead	17		0.90	0.18	mg/Kg	1	☼	6010C	Total/NA
Hg	0.11	J	0.12	0.022	mg/Kg	1	☼	7471B	Total/NA
Chloride	18		13	3.1	mg/Kg	1	☼	9056A	Soluble
Alkalinity	31	B	5.0	2.6	mg/L	1		2320B-1997	ASTM Leach
Hardness as calcium carbonate	36		5.0	2.4	mg/L	1		2340C-1997	ASTM Leach

Client Sample ID: HB17-08

Lab Sample ID: 240-82391-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	190		14	1.6	ug/Kg	1	☼	8270D	Total/NA
Acenaphthylene	71		14	0.75	ug/Kg	1	☼	8270D	Total/NA
Anthracene	370		14	1.7	ug/Kg	1	☼	8270D	Total/NA
Benzo[a]anthracene	940		14	1.4	ug/Kg	1	☼	8270D	Total/NA
Benzo[a]pyrene	880		14	1.4	ug/Kg	1	☼	8270D	Total/NA
Benzo[b]fluoranthene	1300		14	1.3	ug/Kg	1	☼	8270D	Total/NA
Benzo[g,h,i]perylene	570		14	0.75	ug/Kg	1	☼	8270D	Total/NA
Benzo[k]fluoranthene	430		14	1.5	ug/Kg	1	☼	8270D	Total/NA
Chrysene	1200		14	2.4	ug/Kg	1	☼	8270D	Total/NA
Dibenz(a,h)anthracene	140		14	1.4	ug/Kg	1	☼	8270D	Total/NA
Fluoranthene	2200		14	1.2	ug/Kg	1	☼	8270D	Total/NA
Fluorene	240		14	1.1	ug/Kg	1	☼	8270D	Total/NA
Indeno[1,2,3-cd]pyrene	530		14	0.75	ug/Kg	1	☼	8270D	Total/NA
Naphthalene	320		14	1.8	ug/Kg	1	☼	8270D	Total/NA
Phenanthrene	1600		14	1.6	ug/Kg	1	☼	8270D	Total/NA
Pyrene	1800		14	0.95	ug/Kg	1	☼	8270D	Total/NA
Barium	160		38	0.78	mg/Kg	1	☼	6010C	Total/NA
Cadmium	1.2		0.95	0.040	mg/Kg	1	☼	6010C	Total/NA
Chromium	57		1.9	0.14	mg/Kg	1	☼	6010C	Total/NA
Silver	0.93	J	1.9	0.12	mg/Kg	1	☼	6010C	Total/NA
Arsenic	8.2		2.8	0.78	mg/Kg	1	☼	6010C	Total/NA
Lead	290		1.9	0.38	mg/Kg	1	☼	6010C	Total/NA
Hg	0.45		0.23	0.041	mg/Kg	1	☼	7471B	Total/NA
Chloride	30		22	5.1	mg/Kg	1	☼	9056A	Soluble
Alkalinity	88	B	5.0	2.6	mg/L	1		2320B-1997	ASTM Leach
Hardness as calcium carbonate	110		5.0	2.4	mg/L	1		2340C-1997	ASTM Leach

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-01

Lab Sample ID: 240-82391-1

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 53.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	36		12	1.4	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Acenaphthylene	16		12	0.66	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Anthracene	69		12	1.5	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Benzo[a]anthracene	140		12	1.2	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Benzo[a]pyrene	140		12	1.2	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Benzo[b]fluoranthene	210		12	1.1	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Benzo[g,h,i]perylene	110		12	0.66	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Benzo[k]fluoranthene	87		12	1.3	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Chrysene	190		12	2.1	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Dibenz(a,h)anthracene	22		12	1.2	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Fluoranthene	350		12	1.0	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Fluorene	52		12	0.99	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Indeno[1,2,3-cd]pyrene	95		12	0.66	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Naphthalene	56		12	1.5	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Phenanthrene	210		12	1.4	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Pyrene	260		12	0.82	ug/Kg	☼	07/18/17 10:38	07/26/17 18:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	89		41 - 120				07/18/17 10:38	07/26/17 18:18	1
Phenol-d5 (Surr)	73		29 - 120				07/18/17 10:38	07/26/17 18:18	1
Nitrobenzene-d5 (Surr)	58		30 - 120				07/18/17 10:38	07/26/17 18:18	1
2-Fluorophenol (Surr)	63		29 - 120				07/18/17 10:38	07/26/17 18:18	1
2-Fluorobiphenyl (Surr)	78		32 - 120				07/18/17 10:38	07/26/17 18:18	1
2,4,6-Tribromophenol (Surr)	68		10 - 120				07/18/17 10:38	07/26/17 18:18	1

Method: Organotins/GC - Organotins (GC/FPD)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<3.2		3.2	3.2	ug/Kg	☼	07/27/17 15:35	08/07/17 18:21	1
Tributyltin	3.7		2.8	2.8	ug/Kg	☼	07/27/17 15:35	08/09/17 14:26	1
Dibutyltin	<2.4		2.4	2.4	ug/Kg	☼	07/27/17 15:35	08/07/17 18:21	1
Monobutyltin	<38		38	38	ug/Kg	☼	07/27/17 15:35	08/07/17 18:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	50		30 - 120				07/27/17 15:35	08/07/17 18:21	1
Tripentyltin	73		30 - 120				07/27/17 15:35	08/09/17 14:26	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	85		37	0.75	mg/Kg	☼	07/18/17 13:51	07/19/17 17:07	1
Cadmium	0.30	J	0.92	0.039	mg/Kg	☼	07/18/17 13:51	07/19/17 17:07	1
Chromium	23		1.8	0.14	mg/Kg	☼	07/18/17 13:51	07/19/17 17:07	1
Silver	<1.8		1.8	0.12	mg/Kg	☼	07/18/17 13:51	07/19/17 17:07	1
Arsenic	5.2		2.8	0.75	mg/Kg	☼	07/18/17 13:51	07/19/17 17:07	1
Lead	33		1.8	0.37	mg/Kg	☼	07/18/17 13:51	07/19/17 17:07	1
Selenium	<3.7		3.7	0.63	mg/Kg	☼	07/18/17 13:51	07/19/17 17:07	1

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.13	J	0.19	0.034	mg/Kg	☼	07/18/17 16:00	07/19/17 12:04	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
 Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-01

Lab Sample ID: 240-82391-1

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 53.8

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	53.8		0.1	0.1	%			07/17/17 15:31	1
Percent Moisture	46.2		0.1	0.1	%			07/17/17 15:31	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.2	J	19	4.4	mg/Kg	☼		07/19/17 09:39	1

General Chemistry - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	60	B	5.0	2.6	mg/L			07/24/17 11:11	1
Hardness as calcium carbonate	72		5.0	2.4	mg/L			07/24/17 12:43	1

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- 15

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-02

Lab Sample ID: 240-82391-2

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 54.1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	88		12	1.4	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Acenaphthylene	16		12	0.64	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Anthracene	210		12	1.4	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Benzo[a]anthracene	320		12	1.1	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Benzo[a]pyrene	290		12	1.2	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Benzo[b]fluoranthene	340		12	1.1	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Benzo[g,h,i]perylene	120		12	0.64	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Benzo[k]fluoranthene	140		12	1.2	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Chrysene	310		12	2.0	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Dibenz(a,h)anthracene	34		12	1.2	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Fluoranthene	840		12	1.0	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Fluorene	120		12	0.96	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Indeno[1,2,3-cd]pyrene	120		12	0.64	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Naphthalene	53		12	1.5	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Phenanthrene	860		12	1.3	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1
Pyrene	640		12	0.80	ug/Kg	☼	07/18/17 10:38	07/26/17 00:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	84		41 - 120	07/18/17 10:38	07/26/17 00:48	1
Phenol-d5 (Surr)	68		29 - 120	07/18/17 10:38	07/26/17 00:48	1
Nitrobenzene-d5 (Surr)	59		30 - 120	07/18/17 10:38	07/26/17 00:48	1
2-Fluorophenol (Surr)	64		29 - 120	07/18/17 10:38	07/26/17 00:48	1
2-Fluorobiphenyl (Surr)	71		32 - 120	07/18/17 10:38	07/26/17 00:48	1
2,4,6-Tribromophenol (Surr)	64		10 - 120	07/18/17 10:38	07/26/17 00:48	1

Method: Organotins/GC - Organotins (GC/FPD)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<9.4		9.4	9.4	ug/Kg	☼	07/27/17 15:35	08/08/17 12:25	3
Tributyltin	67		8.3	8.3	ug/Kg	☼	07/27/17 15:35	08/08/17 12:25	3
Dibutyltin	<7.2		7.2	7.2	ug/Kg	☼	07/27/17 15:35	08/08/17 12:25	3
Monobutyltin	<110		110	110	ug/Kg	☼	07/27/17 15:35	08/08/17 12:25	3

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tripentyltin	53		30 - 120	07/27/17 15:35	08/08/17 12:25	3
Tripentyltin	52		30 - 120	07/27/17 15:35	08/09/17 14:43	3

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	50		32	0.65	mg/Kg	☼	07/18/17 13:51	07/19/17 15:21	1
Cadmium	0.22	J	0.79	0.033	mg/Kg	☼	07/18/17 13:51	07/19/17 15:21	1
Chromium	14		1.6	0.12	mg/Kg	☼	07/18/17 13:51	07/19/17 15:21	1
Silver	<1.6		1.6	0.099	mg/Kg	☼	07/18/17 13:51	07/19/17 15:21	1
Arsenic	3.6		2.4	0.65	mg/Kg	☼	07/18/17 13:51	07/19/17 17:37	1
Lead	38		1.6	0.32	mg/Kg	☼	07/18/17 13:51	07/19/17 15:21	1
Selenium	0.60	J	3.2	0.54	mg/Kg	☼	07/18/17 13:51	07/19/17 15:21	1

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.099	J	0.16	0.029	mg/Kg	☼	07/18/17 16:00	07/19/17 12:15	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
 Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-02

Lab Sample ID: 240-82391-2

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 54.1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	54.1		0.1	0.1	%			07/17/17 15:31	1
Percent Moisture	45.9		0.1	0.1	%			07/17/17 15:31	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	66		19	4.3	mg/Kg	☼		07/19/17 10:00	1

General Chemistry - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	58	B	5.0	2.6	mg/L			07/24/17 11:20	1
Hardness as calcium carbonate	82		5.0	2.4	mg/L			07/24/17 12:54	1

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-03

Lab Sample ID: 240-82391-3

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 46.9

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	65		14	1.6	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Acenaphthylene	32		14	0.76	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Anthracene	150		14	1.7	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Benzo[a]anthracene	450		14	1.4	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Benzo[a]pyrene	410		14	1.4	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Benzo[b]fluoranthene	540		14	1.3	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Benzo[g,h,i]perylene	280		14	0.76	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Benzo[k]fluoranthene	190		14	1.5	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Chrysene	510		14	2.4	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Dibenz(a,h)anthracene	89		14	1.4	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Fluoranthene	960		14	1.2	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Fluorene	96		14	1.1	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Indeno[1,2,3-cd]pyrene	240		14	0.76	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Naphthalene	180		14	1.8	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Phenanthrene	690		14	1.6	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1
Pyrene	820		14	0.95	ug/Kg	☼	07/18/17 10:38	07/26/17 17:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	85		41 - 120	07/18/17 10:38	07/26/17 17:31	1
Phenol-d5 (Surr)	72		29 - 120	07/18/17 10:38	07/26/17 17:31	1
Nitrobenzene-d5 (Surr)	63		30 - 120	07/18/17 10:38	07/26/17 17:31	1
2-Fluorophenol (Surr)	69		29 - 120	07/18/17 10:38	07/26/17 17:31	1
2-Fluorobiphenyl (Surr)	79		32 - 120	07/18/17 10:38	07/26/17 17:31	1
2,4,6-Tribromophenol (Surr)	70		10 - 120	07/18/17 10:38	07/26/17 17:31	1

Method: Organotins/GC - Organotins (GC/FPD)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<3.6		3.6	3.6	ug/Kg	☼	07/27/17 15:35	08/09/17 15:00	1
Tributyltin	<3.2		3.2	3.2	ug/Kg	☼	07/27/17 15:35	08/09/17 15:00	1
Dibutyltin	<2.8		2.8	2.8	ug/Kg	☼	07/27/17 15:35	08/09/17 15:00	1
Monobutyltin	<44	*	44	44	ug/Kg	☼	07/27/17 15:35	08/09/17 15:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tripentyltin	80		30 - 120	07/27/17 15:35	08/07/17 18:55	1
Tripentyltin	47		30 - 120	07/27/17 15:35	08/09/17 15:00	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	140		41	0.84	mg/Kg	☼	07/18/17 13:51	07/19/17 15:26	1
Cadmium	1.2		1.0	0.043	mg/Kg	☼	07/18/17 13:51	07/19/17 15:26	1
Chromium	32		2.0	0.15	mg/Kg	☼	07/18/17 13:51	07/19/17 15:26	1
Silver	0.62	J	2.0	0.13	mg/Kg	☼	07/18/17 13:51	07/19/17 15:26	1
Arsenic	6.0		3.1	0.84	mg/Kg	☼	07/18/17 13:51	07/19/17 17:41	1
Lead	210		2.0	0.41	mg/Kg	☼	07/18/17 13:51	07/19/17 15:26	1
Selenium	<4.1		4.1	0.70	mg/Kg	☼	07/18/17 13:51	07/19/17 15:26	1

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	1.3		0.19	0.034	mg/Kg	☼	07/18/17 16:00	07/19/17 12:17	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
 Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-03

Lab Sample ID: 240-82391-3

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 46.9

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	46.9		0.1	0.1	%			07/17/17 15:31	1
Percent Moisture	53.1		0.1	0.1	%			07/17/17 15:31	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	28		21	5.0	mg/Kg	☼		07/19/17 10:20	1

General Chemistry - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	23	B	5.0	2.6	mg/L			07/24/17 11:28	1
Hardness as calcium carbonate	50		5.0	2.4	mg/L			07/24/17 12:58	1

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- 2
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Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-04

Lab Sample ID: 240-82391-4

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 52.6

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	87		13	1.5	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Acenaphthylene	39		13	0.67	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Anthracene	160		13	1.5	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Benzo[a]anthracene	480		13	1.2	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Benzo[a]pyrene	460		13	1.2	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Benzo[b]fluoranthene	630		13	1.1	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Benzo[g,h,i]perylene	370		13	0.67	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Benzo[k]fluoranthene	210		13	1.3	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Chrysene	550		13	2.1	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Dibenz(a,h)anthracene	88		13	1.3	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Fluoranthene	1100		13	1.1	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Fluorene	100		13	1.0	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Indeno[1,2,3-cd]pyrene	310		13	0.67	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Naphthalene	190		13	1.6	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Phenanthrene	780		13	1.4	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Pyrene	930		13	0.84	ug/Kg	☼	07/18/17 10:38	07/26/17 17:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	89		41 - 120				07/18/17 10:38	07/26/17 17:54	1
Phenol-d5 (Surr)	69		29 - 120				07/18/17 10:38	07/26/17 17:54	1
Nitrobenzene-d5 (Surr)	60		30 - 120				07/18/17 10:38	07/26/17 17:54	1
2-Fluorophenol (Surr)	68		29 - 120				07/18/17 10:38	07/26/17 17:54	1
2-Fluorobiphenyl (Surr)	76		32 - 120				07/18/17 10:38	07/26/17 17:54	1
2,4,6-Tribromophenol (Surr)	81		10 - 120				07/18/17 10:38	07/26/17 17:54	1

Method: Organotins/GC - Organotins (GC/FPD)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<3.2		3.2	3.2	ug/Kg	☼	07/27/17 15:35	08/09/17 15:16	1
Tributyltin	<2.8		2.8	2.8	ug/Kg	☼	07/27/17 15:35	08/09/17 15:16	1
Dibutyltin	<2.5		2.5	2.5	ug/Kg	☼	07/27/17 15:35	08/09/17 15:16	1
Monobutyltin	<39	*	39	39	ug/Kg	☼	07/27/17 15:35	08/09/17 15:16	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	67		30 - 120				07/27/17 15:35	08/07/17 19:11	1
Tripentyltin	48		30 - 120				07/27/17 15:35	08/09/17 15:16	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	100		33	0.68	mg/Kg	☼	07/18/17 13:51	07/19/17 15:30	1
Cadmium	0.64	J	0.83	0.035	mg/Kg	☼	07/18/17 13:51	07/19/17 15:30	1
Chromium	30		1.7	0.13	mg/Kg	☼	07/18/17 13:51	07/19/17 15:30	1
Silver	<1.7		1.7	0.11	mg/Kg	☼	07/18/17 13:51	07/19/17 15:30	1
Arsenic	5.4		2.5	0.68	mg/Kg	☼	07/18/17 13:51	07/19/17 17:45	1
Lead	96		1.7	0.33	mg/Kg	☼	07/18/17 13:51	07/19/17 15:30	1
Selenium	<3.3		3.3	0.57	mg/Kg	☼	07/18/17 13:51	07/19/17 15:30	1

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.40		0.20	0.035	mg/Kg	☼	07/18/17 16:00	07/19/17 12:19	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
 Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-04

Lab Sample ID: 240-82391-4

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 52.6

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	52.6		0.1	0.1	%			07/17/17 15:31	1
Percent Moisture	47.4		0.1	0.1	%			07/17/17 15:31	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	33		19	4.4	mg/Kg	☼		07/19/17 10:40	1

General Chemistry - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	70	B	5.0	2.6	mg/L			07/24/17 11:36	1
Hardness as calcium carbonate	86		5.0	2.4	mg/L			07/24/17 13:02	1

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Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-05

Lab Sample ID: 240-82391-5

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 49.7

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	48		14	1.5	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Acenaphthylene	28		14	0.71	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Anthracene	98		14	1.6	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Benzo[a]anthracene	240		14	1.3	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Benzo[a]pyrene	250		14	1.3	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Benzo[b]fluoranthene	330		14	1.2	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Benzo[g,h,i]perylene	170		14	0.71	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Benzo[k]fluoranthene	120		14	1.4	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Chrysene	310		14	2.2	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Dibenz(a,h)anthracene	47		14	1.3	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Fluoranthene	520		14	1.1	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Fluorene	78		14	1.1	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Indeno[1,2,3-cd]pyrene	150		14	0.71	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Naphthalene	170		14	1.7	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Phenanthrene	420		14	1.5	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Pyrene	470		14	0.89	ug/Kg	☼	07/18/17 10:38	07/20/17 20:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	76		41 - 120				07/18/17 10:38	07/20/17 20:38	1
Phenol-d5 (Surr)	58		29 - 120				07/18/17 10:38	07/20/17 20:38	1
Nitrobenzene-d5 (Surr)	50		30 - 120				07/18/17 10:38	07/20/17 20:38	1
2-Fluorophenol (Surr)	55		29 - 120				07/18/17 10:38	07/20/17 20:38	1
2-Fluorobiphenyl (Surr)	63		32 - 120				07/18/17 10:38	07/20/17 20:38	1
2,4,6-Tribromophenol (Surr)	60		10 - 120				07/18/17 10:38	07/20/17 20:38	1

Method: Organotins/GC - Organotins (GC/FPD)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<3.4		3.4	3.4	ug/Kg	☼	07/27/17 15:35	08/09/17 15:33	1
Tributyltin	<3.0		3.0	3.0	ug/Kg	☼	07/27/17 15:35	08/09/17 15:33	1
Dibutyltin	<2.6		2.6	2.6	ug/Kg	☼	07/27/17 15:35	08/09/17 15:33	1
Monobutyltin	<42	*	42	42	ug/Kg	☼	07/27/17 15:35	08/09/17 15:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	64		30 - 120				07/27/17 15:35	08/07/17 19:28	1
Tripentyltin	66		30 - 120				07/27/17 15:35	08/09/17 15:33	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	140		28	0.57	mg/Kg	☼	07/18/17 13:51	07/19/17 15:43	1
Cadmium	0.83		0.70	0.029	mg/Kg	☼	07/18/17 13:51	07/19/17 15:43	1
Chromium	32		1.4	0.10	mg/Kg	☼	07/18/17 13:51	07/19/17 15:43	1
Silver	0.20	J	1.4	0.088	mg/Kg	☼	07/18/17 13:51	07/19/17 15:43	1
Arsenic	5.7		2.1	0.57	mg/Kg	☼	07/18/17 13:51	07/19/17 17:49	1
Lead	120		1.4	0.28	mg/Kg	☼	07/18/17 13:51	07/19/17 15:43	1
Selenium	0.54	J	2.8	0.47	mg/Kg	☼	07/18/17 13:51	07/19/17 15:43	1

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.64		0.17	0.031	mg/Kg	☼	07/18/17 16:00	07/19/17 12:22	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
 Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-05

Lab Sample ID: 240-82391-5

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 49.7

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	49.7		0.1	0.1	%			07/17/17 15:31	1
Percent Moisture	50.3		0.1	0.1	%			07/17/17 15:31	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	42		20	4.7	mg/Kg	☼		07/19/17 11:40	1

General Chemistry - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	46	B	5.0	2.6	mg/L			07/24/17 11:49	1
Hardness as calcium carbonate	68		5.0	2.4	mg/L			07/24/17 13:05	1



Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-06

Lab Sample ID: 240-82391-6

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 57.2

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	45		12	1.3	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Acenaphthylene	33		12	0.61	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Anthracene	110		12	1.4	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Benzo[a]anthracene	280		12	1.1	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Benzo[a]pyrene	280		12	1.1	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Benzo[b]fluoranthene	370		12	1.0	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Benzo[g,h,i]perylene	190		12	0.61	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Benzo[k]fluoranthene	150		12	1.2	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Chrysene	350		12	1.9	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Dibenz(a,h)anthracene	52		12	1.1	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Fluoranthene	630		12	0.95	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Fluorene	81		12	0.92	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Indeno[1,2,3-cd]pyrene	170		12	0.61	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Naphthalene	160		12	1.4	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Phenanthrene	480		12	1.3	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Pyrene	540		12	0.76	ug/Kg	☼	07/18/17 10:38	07/20/17 21:02	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	78		41 - 120				07/18/17 10:38	07/20/17 21:02	1
Phenol-d5 (Surr)	71		29 - 120				07/18/17 10:38	07/20/17 21:02	1
Nitrobenzene-d5 (Surr)	63		30 - 120				07/18/17 10:38	07/20/17 21:02	1
2-Fluorophenol (Surr)	65		29 - 120				07/18/17 10:38	07/20/17 21:02	1
2-Fluorobiphenyl (Surr)	76		32 - 120				07/18/17 10:38	07/20/17 21:02	1
2,4,6-Tribromophenol (Surr)	65		10 - 120				07/18/17 10:38	07/20/17 21:02	1

Method: Organotins/GC - Organotins (GC/FPD)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<3.0		3.0	3.0	ug/Kg	☼	07/27/17 15:35	08/07/17 19:45	1
Tributyltin	4.5		2.6	2.6	ug/Kg	☼	07/27/17 15:35	08/09/17 15:50	1
Dibutyltin	<2.3		2.3	2.3	ug/Kg	☼	07/27/17 15:35	08/07/17 19:45	1
Monobutyltin	<36		36	36	ug/Kg	☼	07/27/17 15:35	08/07/17 19:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	77		30 - 120				07/27/17 15:35	08/07/17 19:45	1
Tripentyltin	59		30 - 120				07/27/17 15:35	08/09/17 15:50	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	85		24	0.49	mg/Kg	☼	07/18/17 13:51	07/19/17 15:47	1
Cadmium	0.64		0.60	0.025	mg/Kg	☼	07/18/17 13:51	07/19/17 15:47	1
Chromium	33		1.2	0.090	mg/Kg	☼	07/18/17 13:51	07/19/17 15:47	1
Silver	0.17	J	1.2	0.076	mg/Kg	☼	07/18/17 13:51	07/19/17 15:47	1
Arsenic	5.4		1.8	0.49	mg/Kg	☼	07/18/17 13:51	07/19/17 17:54	1
Lead	400		1.2	0.24	mg/Kg	☼	07/18/17 13:51	07/19/17 15:47	1
Selenium	<2.4		2.4	0.41	mg/Kg	☼	07/18/17 13:51	07/19/17 15:47	1

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.46		0.16	0.029	mg/Kg	☼	07/18/17 16:00	07/19/17 12:24	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
 Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-06

Lab Sample ID: 240-82391-6

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 57.2

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	57.2		0.1	0.1	%			07/17/17 15:31	1
Percent Moisture	42.8		0.1	0.1	%			07/17/17 15:31	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	18		18	4.1	mg/Kg	☼		07/19/17 12:00	1

General Chemistry - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	60	B	5.0	2.6	mg/L			07/24/17 12:05	1
Hardness as calcium carbonate	66		5.0	2.4	mg/L			07/24/17 13:09	1

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Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-07

Lab Sample ID: 240-82391-7

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 76.4

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	25		8.6	0.98	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Acenaphthylene	53		8.6	0.45	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Anthracene	130		8.6	1.0	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Benzo[a]anthracene	340		8.6	0.82	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Benzo[a]pyrene	330		8.6	0.83	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Benzo[b]fluoranthene	400		8.6	0.76	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Benzo[g,h,i]perylene	200		8.6	0.45	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Benzo[k]fluoranthene	170		8.6	0.88	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Chrysene	330		8.6	1.4	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Dibenz(a,h)anthracene	55		8.6	0.85	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Fluoranthene	940		8.6	0.71	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Fluorene	100		8.6	0.69	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Indeno[1,2,3-cd]pyrene	200		8.6	0.45	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Naphthalene	75		8.6	1.1	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Phenanthrene	850		8.6	0.94	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Pyrene	670		8.6	0.57	ug/Kg	☼	07/18/17 10:38	07/26/17 17:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	93		41 - 120				07/18/17 10:38	07/26/17 17:08	1
Phenol-d5 (Surr)	68		29 - 120				07/18/17 10:38	07/26/17 17:08	1
Nitrobenzene-d5 (Surr)	61		30 - 120				07/18/17 10:38	07/26/17 17:08	1
2-Fluorophenol (Surr)	67		29 - 120				07/18/17 10:38	07/26/17 17:08	1
2-Fluorobiphenyl (Surr)	72		32 - 120				07/18/17 10:38	07/26/17 17:08	1
2,4,6-Tribromophenol (Surr)	58		10 - 120				07/18/17 10:38	07/26/17 17:08	1

Method: Organotins/GC - Organotins (GC/FPD)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<2.2		2.2	2.2	ug/Kg	☼	07/27/17 15:35	08/07/17 20:02	1
Tributyltin	<2.0		2.0	2.0	ug/Kg	☼	07/27/17 15:35	08/07/17 20:02	1
Dibutyltin	<1.7		1.7	1.7	ug/Kg	☼	07/27/17 15:35	08/07/17 20:02	1
Monobutyltin	<27	cn	27	27	ug/Kg	☼	07/27/17 15:35	08/07/17 20:02	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	66		30 - 120				07/27/17 15:35	08/07/17 20:02	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	52		18	0.37	mg/Kg	☼	07/18/17 13:51	07/19/17 15:51	1
Cadmium	0.16	J	0.45	0.019	mg/Kg	☼	07/18/17 13:51	07/19/17 15:51	1
Chromium	13		0.90	0.067	mg/Kg	☼	07/18/17 13:51	07/19/17 15:51	1
Silver	<0.90		0.90	0.056	mg/Kg	☼	07/18/17 13:51	07/19/17 15:51	1
Arsenic	2.6		1.3	0.37	mg/Kg	☼	07/18/17 13:51	07/19/17 17:58	1
Lead	17		0.90	0.18	mg/Kg	☼	07/18/17 13:51	07/19/17 15:51	1
Selenium	<1.8		1.8	0.30	mg/Kg	☼	07/18/17 13:51	07/19/17 15:51	1

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.11	J	0.12	0.022	mg/Kg	☼	07/18/17 16:00	07/19/17 12:26	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
 Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-07

Lab Sample ID: 240-82391-7

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 76.4

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	76.4		0.1	0.1	%			07/17/17 15:31	1
Percent Moisture	23.6		0.1	0.1	%			07/17/17 15:31	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	18		13	3.1	mg/Kg	☼		07/19/17 12:20	1

General Chemistry - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	31	B	5.0	2.6	mg/L			07/24/17 12:14	1
Hardness as calcium carbonate	36		5.0	2.4	mg/L			07/24/17 13:13	1

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-08

Lab Sample ID: 240-82391-8

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 45.8

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	190		14	1.6	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Acenaphthylene	71		14	0.75	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Anthracene	370		14	1.7	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Benzo[a]anthracene	940		14	1.4	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Benzo[a]pyrene	880		14	1.4	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Benzo[b]fluoranthene	1300		14	1.3	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Benzo[g,h,i]perylene	570		14	0.75	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Benzo[k]fluoranthene	430		14	1.5	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Chrysene	1200		14	2.4	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Dibenz(a,h)anthracene	140		14	1.4	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Fluoranthene	2200		14	1.2	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Fluorene	240		14	1.1	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Indeno[1,2,3-cd]pyrene	530		14	0.75	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Naphthalene	320		14	1.8	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Phenanthrene	1600		14	1.6	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Pyrene	1800		14	0.95	ug/Kg	☼	07/18/17 10:38	07/20/17 20:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	78		41 - 120				07/18/17 10:38	07/20/17 20:14	1
Phenol-d5 (Surr)	67		29 - 120				07/18/17 10:38	07/20/17 20:14	1
Nitrobenzene-d5 (Surr)	57		30 - 120				07/18/17 10:38	07/20/17 20:14	1
2-Fluorophenol (Surr)	62		29 - 120				07/18/17 10:38	07/20/17 20:14	1
2-Fluorobiphenyl (Surr)	71		32 - 120				07/18/17 10:38	07/20/17 20:14	1
2,4,6-Tribromophenol (Surr)	76		10 - 120				07/18/17 10:38	07/20/17 20:14	1

Method: Organotins/GC - Organotins (GC/FPD)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<3.7		3.7	3.7	ug/Kg	☼	07/27/17 15:35	08/09/17 16:07	1
Tributyltin	<3.3		3.3	3.3	ug/Kg	☼	07/27/17 15:35	08/09/17 16:07	1
Dibutyltin	<2.8		2.8	2.8	ug/Kg	☼	07/27/17 15:35	08/09/17 16:07	1
Monobutyltin	<45	*	45	45	ug/Kg	☼	07/27/17 15:35	08/09/17 16:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	44		30 - 120				07/27/17 15:35	08/09/17 16:07	1

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	160		38	0.78	mg/Kg	☼	07/18/17 13:51	07/19/17 15:55	1
Cadmium	1.2		0.95	0.040	mg/Kg	☼	07/18/17 13:51	07/19/17 15:55	1
Chromium	57		1.9	0.14	mg/Kg	☼	07/18/17 13:51	07/19/17 15:55	1
Silver	0.93	J	1.9	0.12	mg/Kg	☼	07/18/17 13:51	07/19/17 15:55	1
Arsenic	8.2		2.8	0.78	mg/Kg	☼	07/18/17 13:51	07/19/17 18:02	1
Lead	290		1.9	0.38	mg/Kg	☼	07/18/17 13:51	07/19/17 15:55	1
Selenium	<3.8		3.8	0.64	mg/Kg	☼	07/18/17 13:51	07/19/17 15:55	1

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.45		0.23	0.041	mg/Kg	☼	07/18/17 16:00	07/19/17 12:28	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
 Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-08

Lab Sample ID: 240-82391-8

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 45.8

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	45.8		0.1	0.1	%			07/17/17 15:33	1
Percent Moisture	54.2		0.1	0.1	%			07/17/17 15:33	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	30		22	5.1	mg/Kg	☼		07/19/17 12:41	1

General Chemistry - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	88	B	5.0	2.6	mg/L			07/24/17 12:22	1
Hardness as calcium carbonate	110		5.0	2.4	mg/L			07/24/17 13:21	1

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Surrogate Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		TPH (41-120)	PHL (29-120)	NBZ (30-120)	2FP (29-120)	FBP (32-120)	TBP (10-120)
240-82391-1	HB17-01	89	73	58	63	78	68
240-82391-2	HB17-02	84	68	59	64	71	64
240-82391-3	HB17-03	85	72	63	69	79	70
240-82391-4	HB17-04	89	69	60	68	76	81
240-82391-5	HB17-05	76	58	50	55	63	60
240-82391-6	HB17-06	78	71	63	65	76	65
240-82391-7	HB17-07	93	68	61	67	72	58
240-82391-8	HB17-08	78	67	57	62	71	76
LCS 240-287645/23-A	Lab Control Sample	87	69	65	67	73	44
MB 240-287645/22-A	Method Blank	84	66	62	66	69	45

Surrogate Legend

TPH = Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
2FP = 2-Fluorophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)

Method: Organotins/GC - Organotins (GC/FPD)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)
		TPT2 (30-120)
240-82391-1	HB17-01	50
240-82391-1	HB17-01	73
240-82391-2	HB17-02	53
240-82391-2	HB17-02	52
240-82391-3	HB17-03	80
240-82391-3	HB17-03	47
240-82391-4	HB17-04	67
240-82391-4	HB17-04	48
240-82391-5	HB17-05	64
240-82391-5	HB17-05	66
240-82391-6	HB17-06	77
240-82391-6	HB17-06	59
240-82391-7	HB17-07	66
240-82391-8	HB17-08	44
LCS 200-119049/2-A	Lab Control Sample	49
LCS 200-119049/2-A	Lab Control Sample	58
LCSD 200-119049/3-A	Lab Control Sample Dup	57
LCSD 200-119049/3-A	Lab Control Sample Dup	70
MB 200-119049/1-A	Method Blank	72
MB 200-119049/1-A	Method Blank	59

Surrogate Legend

TPT = Triphenyltin

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-287645/22-A

Matrix: Solid

Analysis Batch: 287974

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 287645

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<6.7		6.7	0.76	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Acenaphthylene	<6.7		6.7	0.35	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Anthracene	<6.7		6.7	0.78	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Benzo[a]anthracene	<6.7		6.7	0.63	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Benzo[a]pyrene	<6.7		6.7	0.64	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Benzo[b]fluoranthene	<6.7		6.7	0.59	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Benzo[g,h,i]perylene	<6.7		6.7	0.35	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Benzo[k]fluoranthene	<6.7		6.7	0.68	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Chrysene	<6.7		6.7	1.1	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Dibenz(a,h)anthracene	<6.7		6.7	0.66	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Fluoranthene	<6.7		6.7	0.55	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Fluorene	<6.7		6.7	0.53	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Indeno[1,2,3-cd]pyrene	<6.7		6.7	0.35	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Naphthalene	<6.7		6.7	0.82	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Phenanthrene	<6.7		6.7	0.73	ug/Kg		07/18/17 10:38	07/20/17 11:33	1
Pyrene	<6.7		6.7	0.44	ug/Kg		07/18/17 10:38	07/20/17 11:33	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Terphenyl-d14 (Surr)	84		41 - 120	07/18/17 10:38	07/20/17 11:33	1
Phenol-d5 (Surr)	66		29 - 120	07/18/17 10:38	07/20/17 11:33	1
Nitrobenzene-d5 (Surr)	62		30 - 120	07/18/17 10:38	07/20/17 11:33	1
2-Fluorophenol (Surr)	66		29 - 120	07/18/17 10:38	07/20/17 11:33	1
2-Fluorobiphenyl (Surr)	69		32 - 120	07/18/17 10:38	07/20/17 11:33	1
2,4,6-Tribromophenol (Surr)	45		10 - 120	07/18/17 10:38	07/20/17 11:33	1

Lab Sample ID: LCS 240-287645/23-A

Matrix: Solid

Analysis Batch: 287974

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 287645

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	667	462		ug/Kg		69	48 - 120
Acenaphthylene	667	449		ug/Kg		67	46 - 120
Anthracene	667	527		ug/Kg		79	51 - 120
Benzo[a]anthracene	667	533		ug/Kg		80	53 - 120
Benzo[a]pyrene	667	540		ug/Kg		81	50 - 120
Benzo[b]fluoranthene	667	557		ug/Kg		83	48 - 120
Benzo[g,h,i]perylene	667	515		ug/Kg		77	50 - 120
Benzo[k]fluoranthene	667	521		ug/Kg		78	51 - 120
Chrysene	667	514		ug/Kg		77	54 - 120
Dibenz(a,h)anthracene	667	555		ug/Kg		83	48 - 120
Fluoranthene	667	543		ug/Kg		81	53 - 120
Fluorene	667	485		ug/Kg		73	50 - 120
Indeno[1,2,3-cd]pyrene	667	529		ug/Kg		79	49 - 120
Naphthalene	667	452		ug/Kg		68	48 - 120
Phenanthrene	667	520		ug/Kg		78	52 - 120
Pyrene	667	507		ug/Kg		76	55 - 120

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-287645/23-A
Matrix: Solid
Analysis Batch: 287974

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 287645

	LCS	LCS	
<u>Surrogate</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Terphenyl-d14 (Surr)	87		41 - 120
Phenol-d5 (Surr)	69		29 - 120
Nitrobenzene-d5 (Surr)	65		30 - 120
2-Fluorophenol (Surr)	67		29 - 120
2-Fluorobiphenyl (Surr)	73		32 - 120
2,4,6-Tribromophenol (Surr)	44		10 - 120

Method: Organotins/GC - Organotins (GC/FPD)

Lab Sample ID: MB 200-119049/1-A
Matrix: Solid
Analysis Batch: 119464

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 119049

<u>Analyte</u>	MB MB		<u>RL</u>	<u>MDL</u>	<u>Unit</u>	<u>D</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
	<u>Result</u>	<u>Qualifier</u>							
Tetrabutyltin	<1.7		1.7	1.7	ug/Kg		07/27/17 15:35	08/07/17 17:31	1
Tributyltin	<1.5		1.5	1.5	ug/Kg		07/27/17 15:35	08/07/17 17:31	1
Dibutyltin	<1.3		1.3	1.3	ug/Kg		07/27/17 15:35	08/07/17 17:31	1
Monobutyltin	<20		20	20	ug/Kg		07/27/17 15:35	08/07/17 17:31	1

	MB MB					
<u>Surrogate</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
Tripentyltin	72		30 - 120	07/27/17 15:35	08/07/17 17:31	1

Lab Sample ID: MB 200-119049/1-A
Matrix: Solid
Analysis Batch: 119540

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 119049

<u>Analyte</u>	MB MB		<u>RL</u>	<u>MDL</u>	<u>Unit</u>	<u>D</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
	<u>Result</u>	<u>Qualifier</u>							
Tetrabutyltin	<1.7		1.7	1.7	ug/Kg		07/27/17 15:35	08/09/17 13:36	1
Tributyltin	<1.5		1.5	1.5	ug/Kg		07/27/17 15:35	08/09/17 13:36	1
Dibutyltin	<1.3		1.3	1.3	ug/Kg		07/27/17 15:35	08/09/17 13:36	1
Monobutyltin	<20		20	20	ug/Kg		07/27/17 15:35	08/09/17 13:36	1

	MB MB					
<u>Surrogate</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Dil Fac</u>
Tripentyltin	59		30 - 120	07/27/17 15:35	08/09/17 13:36	1

Lab Sample ID: LCS 200-119049/2-A
Matrix: Solid
Analysis Batch: 119464

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 119049

<u>Analyte</u>	<u>Spike Added</u>	LCS LCS		<u>Unit</u>	<u>D</u>	<u>%Rec</u>	<u>Limits</u>
		<u>Result</u>	<u>Qualifier</u>				
Tributyltin	14.7	6.87		ug/Kg		47	30 - 160

	LCS LCS		
<u>Surrogate</u>	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Tripentyltin	49		30 - 120

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Method: Organotins/GC - Organotins (GC/FPD) (Continued)

Lab Sample ID: LCS 200-119049/2-A

Matrix: Solid

Analysis Batch: 119540

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 119049

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Tetrabutyltin	16.5	10.1		ug/Kg		61	30 - 160
Dibutyltin	12.7	6.25		ug/Kg		49	30 - 160
Monobutyltin	51.1	<20		ug/Kg		26	10 - 48

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Tripentyltin	58		30 - 120

Lab Sample ID: LCSD 200-119049/3-A

Matrix: Solid

Analysis Batch: 119464

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 119049

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Tetrabutyltin	16.5	11.0		ug/Kg		67	30 - 160	6	30
Tributyltin	14.7	7.77		ug/Kg		53	30 - 160	12	30
Dibutyltin	12.7	8.62		ug/Kg		68	30 - 160	30	30
Monobutyltin	51.2	<20		ug/Kg		36	10 - 48	21	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Tripentyltin	57		30 - 120

Lab Sample ID: LCSD 200-119049/3-A

Matrix: Solid

Analysis Batch: 119540

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 119049

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Tripentyltin	70		30 - 120

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-287710/1-A

Matrix: Solid

Analysis Batch: 287901

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 287710

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<20		20	0.41	mg/Kg		07/18/17 13:51	07/19/17 16:59	1
Cadmium	<0.50		0.50	0.021	mg/Kg		07/18/17 13:51	07/19/17 16:59	1
Chromium	<1.0		1.0	0.075	mg/Kg		07/18/17 13:51	07/19/17 16:59	1
Silver	<1.0		1.0	0.063	mg/Kg		07/18/17 13:51	07/19/17 16:59	1
Arsenic	<1.5		1.5	0.41	mg/Kg		07/18/17 13:51	07/19/17 16:59	1
Lead	<1.0		1.0	0.20	mg/Kg		07/18/17 13:51	07/19/17 16:59	1
Selenium	<2.0		2.0	0.34	mg/Kg		07/18/17 13:51	07/19/17 16:59	1

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 240-287710/2-A
Matrix: Solid
Analysis Batch: 287901

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 287710

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	200	197		mg/Kg		98	80 - 120
Cadmium	5.00	4.98		mg/Kg		100	80 - 120
Chromium	20.0	19.6		mg/Kg		98	80 - 120
Silver	5.00	5.02		mg/Kg		100	80 - 120
Arsenic	200	202		mg/Kg		101	80 - 120
Lead	50.0	47.7		mg/Kg		95	80 - 120
Selenium	200	199		mg/Kg		99	80 - 120

Lab Sample ID: 240-82391-1 MS
Matrix: Solid
Analysis Batch: 287901

Client Sample ID: HB17-01
Prep Type: Total/NA
Prep Batch: 287710

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	85		326	397		mg/Kg	☼	96	75 - 125
Cadmium	0.30	J	8.15	8.06		mg/Kg	☼	95	75 - 125
Chromium	23		32.6	56.0		mg/Kg	☼	102	75 - 125
Silver	<1.8		8.15	7.90		mg/Kg	☼	97	75 - 125
Arsenic	5.2		326	318		mg/Kg	☼	96	75 - 125
Lead	33		81.5	98.0		mg/Kg	☼	80	75 - 125
Selenium	<3.7		326	302		mg/Kg	☼	93	75 - 125

Lab Sample ID: 240-82391-1 MSD
Matrix: Solid
Analysis Batch: 287901

Client Sample ID: HB17-01
Prep Type: Total/NA
Prep Batch: 287710

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Barium	85		326	397		mg/Kg	☼	95	75 - 125	0	20
Cadmium	0.30	J	8.15	8.07		mg/Kg	☼	95	75 - 125	0	20
Chromium	23		32.6	55.0		mg/Kg	☼	99	75 - 125	2	20
Silver	<1.8		8.15	7.90		mg/Kg	☼	97	75 - 125	0	20
Arsenic	5.2		326	315		mg/Kg	☼	95	75 - 125	1	20
Lead	33		81.5	101		mg/Kg	☼	83	75 - 125	3	20
Selenium	<3.7		326	300		mg/Kg	☼	92	75 - 125	1	20

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 240-287711/1-A
Matrix: Solid
Analysis Batch: 287842

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 287711

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	<0.10		0.10	0.018	mg/Kg		07/18/17 16:00	07/19/17 12:00	1

Lab Sample ID: LCS 240-287711/2-A
Matrix: Solid
Analysis Batch: 287842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 287711

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	0.833	0.790		mg/Kg		95	80 - 120

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Lab Sample ID: 240-82391-1 MS
Matrix: Solid
Analysis Batch: 287842

Client Sample ID: HB17-01
Prep Type: Total/NA
Prep Batch: 287711

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	0.13	J	0.326	0.436		mg/Kg	☼	95	80 - 120

Lab Sample ID: 240-82391-1 MSD
Matrix: Solid
Analysis Batch: 287842

Client Sample ID: HB17-01
Prep Type: Total/NA
Prep Batch: 287711

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	0.13	J	0.326	0.418		mg/Kg	☼	89	80 - 120	4	20

Method: 2320B-1997 - Alkalinity, Total

Lab Sample ID: LB 240-288077/1-A
Matrix: Solid
Analysis Batch: 288447

Client Sample ID: Method Blank
Prep Type: ASTM Leach

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	4.63	J	5.0	2.6	mg/L			07/24/17 11:03	1

Lab Sample ID: 240-82391-5 DU
Matrix: Solid
Analysis Batch: 288447

Client Sample ID: HB17-05
Prep Type: ASTM Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	Prepared	RPD	RPD Limit
Alkalinity	46	B	43.9		mg/L			4	20

Method: 2340C-1997 - Hardness, Total

Lab Sample ID: MB 240-288451/24
Matrix: Solid
Analysis Batch: 288451

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	<5.0		5.0	2.4	mg/L			07/24/17 12:27	1

Lab Sample ID: LCS 240-288451/26
Matrix: Solid
Analysis Batch: 288451

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hardness as calcium carbonate	170	180		mg/L		106	90 - 110

Lab Sample ID: LB 240-288077/1-A
Matrix: Solid
Analysis Batch: 288451

Client Sample ID: Method Blank
Prep Type: ASTM Leach

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	<5.0		5.0	2.4	mg/L			07/24/17 12:31	1

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Method: 2340C-1997 - Hardness, Total (Continued)

Lab Sample ID: 240-82391-1 MS
Matrix: Solid
Analysis Batch: 288451

Client Sample ID: HB17-01
Prep Type: ASTM Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hardness as calcium carbonate	72		200	290		mg/L		109	80 - 120

Lab Sample ID: 240-82391-1 MSD
Matrix: Solid
Analysis Batch: 288451

Client Sample ID: HB17-01
Prep Type: ASTM Leach

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hardness as calcium carbonate	72		200	290		mg/L		109	80 - 120	0	10

Lab Sample ID: 240-82391-1 DU
Matrix: Solid
Analysis Batch: 288451

Client Sample ID: HB17-01
Prep Type: ASTM Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Hardness as calcium carbonate	72		72.0		mg/L		0	20

Lab Sample ID: 240-82391-8 DU
Matrix: Solid
Analysis Batch: 288451

Client Sample ID: HB17-08
Prep Type: ASTM Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Hardness as calcium carbonate	110		104		mg/L		2	20

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 240-287742/1-A
Matrix: Solid
Analysis Batch: 287743

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<10		10	2.3	mg/Kg			07/19/17 07:39	1

Lab Sample ID: LCS 240-287742/2-A
Matrix: Solid
Analysis Batch: 287743

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	505	503		mg/Kg		100	90 - 110

Method: Moisture - Percent Moisture

Lab Sample ID: 240-82391-7 DU
Matrix: Solid
Analysis Batch: 287412

Client Sample ID: HB17-07
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Solids	76.4		76.8		%		0.6	20
Percent Moisture	23.6		23.2		%		2	20

TestAmerica Canton

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

GC/MS Semi VOA

Prep Batch: 287645

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	Total/NA	Solid	3540C	
240-82391-2	HB17-02	Total/NA	Solid	3540C	
240-82391-3	HB17-03	Total/NA	Solid	3540C	
240-82391-4	HB17-04	Total/NA	Solid	3540C	
240-82391-5	HB17-05	Total/NA	Solid	3540C	
240-82391-6	HB17-06	Total/NA	Solid	3540C	
240-82391-7	HB17-07	Total/NA	Solid	3540C	
240-82391-8	HB17-08	Total/NA	Solid	3540C	
MB 240-287645/22-A	Method Blank	Total/NA	Solid	3540C	
LCS 240-287645/23-A	Lab Control Sample	Total/NA	Solid	3540C	

Analysis Batch: 287974

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-5	HB17-05	Total/NA	Solid	8270D	287645
240-82391-6	HB17-06	Total/NA	Solid	8270D	287645
240-82391-8	HB17-08	Total/NA	Solid	8270D	287645
MB 240-287645/22-A	Method Blank	Total/NA	Solid	8270D	287645
LCS 240-287645/23-A	Lab Control Sample	Total/NA	Solid	8270D	287645

Analysis Batch: 288556

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-2	HB17-02	Total/NA	Solid	8270D	287645

Analysis Batch: 288723

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	Total/NA	Solid	8270D	287645
240-82391-3	HB17-03	Total/NA	Solid	8270D	287645
240-82391-4	HB17-04	Total/NA	Solid	8270D	287645
240-82391-7	HB17-07	Total/NA	Solid	8270D	287645

GC Semi VOA

Prep Batch: 119049

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	Total/NA	Solid	3550C	
240-82391-2	HB17-02	Total/NA	Solid	3550C	
240-82391-3	HB17-03	Total/NA	Solid	3550C	
240-82391-4	HB17-04	Total/NA	Solid	3550C	
240-82391-5	HB17-05	Total/NA	Solid	3550C	
240-82391-6	HB17-06	Total/NA	Solid	3550C	
240-82391-7	HB17-07	Total/NA	Solid	3550C	
240-82391-8	HB17-08	Total/NA	Solid	3550C	
MB 200-119049/1-A	Method Blank	Total/NA	Solid	3550C	
LCS 200-119049/2-A	Lab Control Sample	Total/NA	Solid	3550C	
LCSD 200-119049/3-A	Lab Control Sample Dup	Total/NA	Solid	3550C	

Analysis Batch: 119464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	Total/NA	Solid	Organotins/GC	119049
240-82391-3	HB17-03	Total/NA	Solid	Organotins/GC	119049

TestAmerica Canton

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

GC Semi VOA (Continued)

Analysis Batch: 119464 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-4	HB17-04	Total/NA	Solid	Organotins/GC	119049
240-82391-5	HB17-05	Total/NA	Solid	Organotins/GC	119049
240-82391-6	HB17-06	Total/NA	Solid	Organotins/GC	119049
240-82391-7	HB17-07	Total/NA	Solid	Organotins/GC	119049
MB 200-119049/1-A	Method Blank	Total/NA	Solid	Organotins/GC	119049
LCS 200-119049/2-A	Lab Control Sample	Total/NA	Solid	Organotins/GC	119049
LCSD 200-119049/3-A	Lab Control Sample Dup	Total/NA	Solid	Organotins/GC	119049

Analysis Batch: 119491

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-2	HB17-02	Total/NA	Solid	Organotins/GC	119049

Analysis Batch: 119540

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	Total/NA	Solid	Organotins/GC	119049
240-82391-2	HB17-02	Total/NA	Solid	Organotins/GC	119049
240-82391-3	HB17-03	Total/NA	Solid	Organotins/GC	119049
240-82391-4	HB17-04	Total/NA	Solid	Organotins/GC	119049
240-82391-5	HB17-05	Total/NA	Solid	Organotins/GC	119049
240-82391-6	HB17-06	Total/NA	Solid	Organotins/GC	119049
240-82391-8	HB17-08	Total/NA	Solid	Organotins/GC	119049
MB 200-119049/1-A	Method Blank	Total/NA	Solid	Organotins/GC	119049
LCS 200-119049/2-A	Lab Control Sample	Total/NA	Solid	Organotins/GC	119049
LCSD 200-119049/3-A	Lab Control Sample Dup	Total/NA	Solid	Organotins/GC	119049

Metals

Prep Batch: 287710

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	Total/NA	Solid	3050B	
240-82391-2	HB17-02	Total/NA	Solid	3050B	
240-82391-3	HB17-03	Total/NA	Solid	3050B	
240-82391-4	HB17-04	Total/NA	Solid	3050B	
240-82391-5	HB17-05	Total/NA	Solid	3050B	
240-82391-6	HB17-06	Total/NA	Solid	3050B	
240-82391-7	HB17-07	Total/NA	Solid	3050B	
240-82391-8	HB17-08	Total/NA	Solid	3050B	
MB 240-287710/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 240-287710/2-A	Lab Control Sample	Total/NA	Solid	3050B	
240-82391-1 MS	HB17-01	Total/NA	Solid	3050B	
240-82391-1 MSD	HB17-01	Total/NA	Solid	3050B	

Prep Batch: 287711

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	Total/NA	Solid	7471B	
240-82391-2	HB17-02	Total/NA	Solid	7471B	
240-82391-3	HB17-03	Total/NA	Solid	7471B	
240-82391-4	HB17-04	Total/NA	Solid	7471B	
240-82391-5	HB17-05	Total/NA	Solid	7471B	
240-82391-6	HB17-06	Total/NA	Solid	7471B	

TestAmerica Canton

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Metals (Continued)

Prep Batch: 287711 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-7	HB17-07	Total/NA	Solid	7471B	
240-82391-8	HB17-08	Total/NA	Solid	7471B	
MB 240-287711/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 240-287711/2-A	Lab Control Sample	Total/NA	Solid	7471B	
240-82391-1 MS	HB17-01	Total/NA	Solid	7471B	
240-82391-1 MSD	HB17-01	Total/NA	Solid	7471B	

Analysis Batch: 287842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	Total/NA	Solid	7471B	287711
240-82391-2	HB17-02	Total/NA	Solid	7471B	287711
240-82391-3	HB17-03	Total/NA	Solid	7471B	287711
240-82391-4	HB17-04	Total/NA	Solid	7471B	287711
240-82391-5	HB17-05	Total/NA	Solid	7471B	287711
240-82391-6	HB17-06	Total/NA	Solid	7471B	287711
240-82391-7	HB17-07	Total/NA	Solid	7471B	287711
240-82391-8	HB17-08	Total/NA	Solid	7471B	287711
MB 240-287711/1-A	Method Blank	Total/NA	Solid	7471B	287711
LCS 240-287711/2-A	Lab Control Sample	Total/NA	Solid	7471B	287711
240-82391-1 MS	HB17-01	Total/NA	Solid	7471B	287711
240-82391-1 MSD	HB17-01	Total/NA	Solid	7471B	287711

Analysis Batch: 287901

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	Total/NA	Solid	6010C	287710
240-82391-2	HB17-02	Total/NA	Solid	6010C	287710
240-82391-2	HB17-02	Total/NA	Solid	6010C	287710
240-82391-3	HB17-03	Total/NA	Solid	6010C	287710
240-82391-3	HB17-03	Total/NA	Solid	6010C	287710
240-82391-4	HB17-04	Total/NA	Solid	6010C	287710
240-82391-4	HB17-04	Total/NA	Solid	6010C	287710
240-82391-5	HB17-05	Total/NA	Solid	6010C	287710
240-82391-5	HB17-05	Total/NA	Solid	6010C	287710
240-82391-6	HB17-06	Total/NA	Solid	6010C	287710
240-82391-6	HB17-06	Total/NA	Solid	6010C	287710
240-82391-7	HB17-07	Total/NA	Solid	6010C	287710
240-82391-7	HB17-07	Total/NA	Solid	6010C	287710
240-82391-8	HB17-08	Total/NA	Solid	6010C	287710
240-82391-8	HB17-08	Total/NA	Solid	6010C	287710
MB 240-287710/1-A	Method Blank	Total/NA	Solid	6010C	287710
LCS 240-287710/2-A	Lab Control Sample	Total/NA	Solid	6010C	287710
240-82391-1 MS	HB17-01	Total/NA	Solid	6010C	287710
240-82391-1 MSD	HB17-01	Total/NA	Solid	6010C	287710

General Chemistry

Analysis Batch: 287412

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	Total/NA	Solid	Moisture	
240-82391-2	HB17-02	Total/NA	Solid	Moisture	

TestAmerica Canton

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

General Chemistry (Continued)

Analysis Batch: 287412 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-3	HB17-03	Total/NA	Solid	Moisture	
240-82391-4	HB17-04	Total/NA	Solid	Moisture	
240-82391-5	HB17-05	Total/NA	Solid	Moisture	
240-82391-6	HB17-06	Total/NA	Solid	Moisture	
240-82391-7	HB17-07	Total/NA	Solid	Moisture	
240-82391-8	HB17-08	Total/NA	Solid	Moisture	
240-82391-7 DU	HB17-07	Total/NA	Solid	Moisture	

Leach Batch: 287742

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	Soluble	Solid	DI Leach	
240-82391-2	HB17-02	Soluble	Solid	DI Leach	
240-82391-3	HB17-03	Soluble	Solid	DI Leach	
240-82391-4	HB17-04	Soluble	Solid	DI Leach	
240-82391-5	HB17-05	Soluble	Solid	DI Leach	
240-82391-6	HB17-06	Soluble	Solid	DI Leach	
240-82391-7	HB17-07	Soluble	Solid	DI Leach	
240-82391-8	HB17-08	Soluble	Solid	DI Leach	
MB 240-287742/1-A	Method Blank	Soluble	Solid	DI Leach	
LCS 240-287742/2-A	Lab Control Sample	Soluble	Solid	DI Leach	

Analysis Batch: 287743

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	Soluble	Solid	9056A	287742
240-82391-2	HB17-02	Soluble	Solid	9056A	287742
240-82391-3	HB17-03	Soluble	Solid	9056A	287742
240-82391-4	HB17-04	Soluble	Solid	9056A	287742
240-82391-5	HB17-05	Soluble	Solid	9056A	287742
240-82391-6	HB17-06	Soluble	Solid	9056A	287742
240-82391-7	HB17-07	Soluble	Solid	9056A	287742
240-82391-8	HB17-08	Soluble	Solid	9056A	287742
MB 240-287742/1-A	Method Blank	Soluble	Solid	9056A	287742
LCS 240-287742/2-A	Lab Control Sample	Soluble	Solid	9056A	287742

Leach Batch: 288077

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	ASTM Leach	Solid	D3987-85	
240-82391-2	HB17-02	ASTM Leach	Solid	D3987-85	
240-82391-3	HB17-03	ASTM Leach	Solid	D3987-85	
240-82391-4	HB17-04	ASTM Leach	Solid	D3987-85	
240-82391-5	HB17-05	ASTM Leach	Solid	D3987-85	
240-82391-6	HB17-06	ASTM Leach	Solid	D3987-85	
240-82391-7	HB17-07	ASTM Leach	Solid	D3987-85	
240-82391-8	HB17-08	ASTM Leach	Solid	D3987-85	
LB 240-288077/1-A	Method Blank	ASTM Leach	Solid	D3987-85	
240-82391-1 MS	HB17-01	ASTM Leach	Solid	D3987-85	
240-82391-1 MSD	HB17-01	ASTM Leach	Solid	D3987-85	
240-82391-1 DU	HB17-01	ASTM Leach	Solid	D3987-85	
240-82391-5 DU	HB17-05	ASTM Leach	Solid	D3987-85	
240-82391-8 DU	HB17-08	ASTM Leach	Solid	D3987-85	

TestAmerica Canton

QC Association Summary

Client: ARCADIS U.S. Inc
 Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

General Chemistry (Continued)

Analysis Batch: 288447

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	ASTM Leach	Solid	2320B-1997	288077
240-82391-2	HB17-02	ASTM Leach	Solid	2320B-1997	288077
240-82391-3	HB17-03	ASTM Leach	Solid	2320B-1997	288077
240-82391-4	HB17-04	ASTM Leach	Solid	2320B-1997	288077
240-82391-5	HB17-05	ASTM Leach	Solid	2320B-1997	288077
240-82391-6	HB17-06	ASTM Leach	Solid	2320B-1997	288077
240-82391-7	HB17-07	ASTM Leach	Solid	2320B-1997	288077
240-82391-8	HB17-08	ASTM Leach	Solid	2320B-1997	288077
LB 240-288077/1-A	Method Blank	ASTM Leach	Solid	2320B-1997	288077
240-82391-5 DU	HB17-05	ASTM Leach	Solid	2320B-1997	288077

Analysis Batch: 288451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-82391-1	HB17-01	ASTM Leach	Solid	2340C-1997	288077
240-82391-2	HB17-02	ASTM Leach	Solid	2340C-1997	288077
240-82391-3	HB17-03	ASTM Leach	Solid	2340C-1997	288077
240-82391-4	HB17-04	ASTM Leach	Solid	2340C-1997	288077
240-82391-5	HB17-05	ASTM Leach	Solid	2340C-1997	288077
240-82391-6	HB17-06	ASTM Leach	Solid	2340C-1997	288077
240-82391-7	HB17-07	ASTM Leach	Solid	2340C-1997	288077
240-82391-8	HB17-08	ASTM Leach	Solid	2340C-1997	288077
LB 240-288077/1-A	Method Blank	ASTM Leach	Solid	2340C-1997	288077
MB 240-288451/24	Method Blank	Total/NA	Solid	2340C-1997	
LCS 240-288451/26	Lab Control Sample	Total/NA	Solid	2340C-1997	
240-82391-1 MS	HB17-01	ASTM Leach	Solid	2340C-1997	288077
240-82391-1 MSD	HB17-01	ASTM Leach	Solid	2340C-1997	288077
240-82391-1 DU	HB17-01	ASTM Leach	Solid	2340C-1997	288077
240-82391-8 DU	HB17-08	ASTM Leach	Solid	2340C-1997	288077

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-01

Date Collected: 07/14/17 14:30

Date Received: 07/15/17 09:40

Lab Sample ID: 240-82391-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2320B-1997		1	288447	07/24/17 11:11	MM	TAL CAN
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2340C-1997		1	288451	07/24/17 12:43	TPH	TAL CAN
Total/NA	Analysis	Moisture		1	287412	07/17/17 15:31	PW	TAL CAN

Client Sample ID: HB17-01

Date Collected: 07/14/17 14:30

Date Received: 07/15/17 09:40

Lab Sample ID: 240-82391-1

Matrix: Solid

Percent Solids: 53.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3540C			287645	07/18/17 10:38	JT	TAL CAN
Total/NA	Analysis	8270D		1	288723	07/26/17 18:18	JMG	TAL CAN
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		1	119464	08/07/17 18:21	RRM	TAL BUR
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		1	119540	08/09/17 14:26	RRM	TAL BUR
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 17:07	KLC	TAL CAN
Total/NA	Prep	7471B			287711	07/18/17 16:00	DEE	TAL CAN
Total/NA	Analysis	7471B		1	287842	07/19/17 12:04	DTN	TAL CAN
Soluble	Leach	DI Leach			287742	07/18/17 17:00	JWW	TAL CAN
Soluble	Analysis	9056A		1	287743	07/19/17 09:39	LKG	TAL CAN

Client Sample ID: HB17-02

Date Collected: 07/14/17 14:30

Date Received: 07/15/17 09:40

Lab Sample ID: 240-82391-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2320B-1997		1	288447	07/24/17 11:20	MM	TAL CAN
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2340C-1997		1	288451	07/24/17 12:54	TPH	TAL CAN
Total/NA	Analysis	Moisture		1	287412	07/17/17 15:31	PW	TAL CAN

Client Sample ID: HB17-02

Date Collected: 07/14/17 14:30

Date Received: 07/15/17 09:40

Lab Sample ID: 240-82391-2

Matrix: Solid

Percent Solids: 54.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3540C			287645	07/18/17 10:38	JT	TAL CAN
Total/NA	Analysis	8270D		1	288556	07/26/17 00:48	JMG	TAL CAN
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR

TestAmerica Canton

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-02

Lab Sample ID: 240-82391-2

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 54.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Organotins/GC		3	119491	08/08/17 12:25	RRM	TAL BUR
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		3	119540	08/09/17 14:43	RRM	TAL BUR
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 15:21	KLC	TAL CAN
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 17:37	KLC	TAL CAN
Total/NA	Prep	7471B			287711	07/18/17 16:00	DEE	TAL CAN
Total/NA	Analysis	7471B		1	287842	07/19/17 12:15	DTN	TAL CAN
Soluble	Leach	DI Leach			287742	07/18/17 17:00	JWW	TAL CAN
Soluble	Analysis	9056A		1	287743	07/19/17 10:00	LKG	TAL CAN

Client Sample ID: HB17-03

Lab Sample ID: 240-82391-3

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2320B-1997		1	288447	07/24/17 11:28	MM	TAL CAN
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2340C-1997		1	288451	07/24/17 12:58	TPH	TAL CAN
Total/NA	Analysis	Moisture		1	287412	07/17/17 15:31	PW	TAL CAN

Client Sample ID: HB17-03

Lab Sample ID: 240-82391-3

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 46.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3540C			287645	07/18/17 10:38	JT	TAL CAN
Total/NA	Analysis	8270D		1	288723	07/26/17 17:31	JMG	TAL CAN
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		1	119464	08/07/17 18:55	RRM	TAL BUR
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		1	119540	08/09/17 15:00	RRM	TAL BUR
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 15:26	KLC	TAL CAN
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 17:41	KLC	TAL CAN
Total/NA	Prep	7471B			287711	07/18/17 16:00	DEE	TAL CAN
Total/NA	Analysis	7471B		1	287842	07/19/17 12:17	DTN	TAL CAN
Soluble	Leach	DI Leach			287742	07/18/17 17:00	JWW	TAL CAN
Soluble	Analysis	9056A		1	287743	07/19/17 10:20	LKG	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-04

Lab Sample ID: 240-82391-4

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2320B-1997		1	288447	07/24/17 11:36	MM	TAL CAN
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2340C-1997		1	288451	07/24/17 13:02	TPH	TAL CAN
Total/NA	Analysis	Moisture		1	287412	07/17/17 15:31	PW	TAL CAN

Client Sample ID: HB17-04

Lab Sample ID: 240-82391-4

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 52.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3540C			287645	07/18/17 10:38	JT	TAL CAN
Total/NA	Analysis	8270D		1	288723	07/26/17 17:54	JMG	TAL CAN
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		1	119464	08/07/17 19:11	RRM	TAL BUR
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		1	119540	08/09/17 15:16	RRM	TAL BUR
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 15:30	KLC	TAL CAN
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 17:45	KLC	TAL CAN
Total/NA	Prep	7471B			287711	07/18/17 16:00	DEE	TAL CAN
Total/NA	Analysis	7471B		1	287842	07/19/17 12:19	DTN	TAL CAN
Soluble	Leach	DI Leach			287742	07/18/17 17:00	JWW	TAL CAN
Soluble	Analysis	9056A		1	287743	07/19/17 10:40	LKG	TAL CAN

Client Sample ID: HB17-05

Lab Sample ID: 240-82391-5

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2320B-1997		1	288447	07/24/17 11:49	MM	TAL CAN
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2340C-1997		1	288451	07/24/17 13:05	TPH	TAL CAN
Total/NA	Analysis	Moisture		1	287412	07/17/17 15:31	PW	TAL CAN

Client Sample ID: HB17-05

Lab Sample ID: 240-82391-5

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 49.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3540C			287645	07/18/17 10:38	JT	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-05

Lab Sample ID: 240-82391-5

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 49.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8270D		1	287974	07/20/17 20:38	JMG	TAL CAN
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		1	119464	08/07/17 19:28	RRM	TAL BUR
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		1	119540	08/09/17 15:33	RRM	TAL BUR
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 15:43	KLC	TAL CAN
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 17:49	KLC	TAL CAN
Total/NA	Prep	7471B			287711	07/18/17 16:00	DEE	TAL CAN
Total/NA	Analysis	7471B		1	287842	07/19/17 12:22	DTN	TAL CAN
Soluble	Leach	DI Leach			287742	07/18/17 17:00	JWW	TAL CAN
Soluble	Analysis	9056A		1	287743	07/19/17 11:40	LKG	TAL CAN

Client Sample ID: HB17-06

Lab Sample ID: 240-82391-6

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2320B-1997		1	288447	07/24/17 12:05	MM	TAL CAN
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2340C-1997		1	288451	07/24/17 13:09	TPH	TAL CAN
Total/NA	Analysis	Moisture		1	287412	07/17/17 15:31	PW	TAL CAN

Client Sample ID: HB17-06

Lab Sample ID: 240-82391-6

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 57.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3540C			287645	07/18/17 10:38	JT	TAL CAN
Total/NA	Analysis	8270D		1	287974	07/20/17 21:02	JMG	TAL CAN
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		1	119464	08/07/17 19:45	RRM	TAL BUR
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		1	119540	08/09/17 15:50	RRM	TAL BUR
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 15:47	KLC	TAL CAN
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 17:54	KLC	TAL CAN
Total/NA	Prep	7471B			287711	07/18/17 16:00	DEE	TAL CAN
Total/NA	Analysis	7471B		1	287842	07/19/17 12:24	DTN	TAL CAN
Soluble	Leach	DI Leach			287742	07/18/17 17:00	JWW	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-06

Lab Sample ID: 240-82391-6

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 57.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Analysis	9056A		1	287743	07/19/17 12:00	LKG	TAL CAN

Client Sample ID: HB17-07

Lab Sample ID: 240-82391-7

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2320B-1997		1	288447	07/24/17 12:14	MM	TAL CAN
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2340C-1997		1	288451	07/24/17 13:13	TPH	TAL CAN
Total/NA	Analysis	Moisture		1	287412	07/17/17 15:31	PW	TAL CAN

Client Sample ID: HB17-07

Lab Sample ID: 240-82391-7

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 76.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3540C			287645	07/18/17 10:38	JT	TAL CAN
Total/NA	Analysis	8270D		1	288723	07/26/17 17:08	JMG	TAL CAN
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		1	119464	08/07/17 20:02	RRM	TAL BUR
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 15:51	KLC	TAL CAN
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 17:58	KLC	TAL CAN
Total/NA	Prep	7471B			287711	07/18/17 16:00	DEE	TAL CAN
Total/NA	Analysis	7471B		1	287842	07/19/17 12:26	DTN	TAL CAN
Soluble	Leach	DI Leach			287742	07/18/17 17:00	JWW	TAL CAN
Soluble	Analysis	9056A		1	287743	07/19/17 12:20	LKG	TAL CAN

Client Sample ID: HB17-08

Lab Sample ID: 240-82391-8

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2320B-1997		1	288447	07/24/17 12:22	MM	TAL CAN
ASTM Leach	Leach	D3987-85			288077	07/20/17 15:00	DRJ	TAL CAN
ASTM Leach	Analysis	2340C-1997		1	288451	07/24/17 13:21	TPH	TAL CAN
Total/NA	Analysis	Moisture		1	287412	07/17/17 15:33	PW	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Client Sample ID: HB17-08

Lab Sample ID: 240-82391-8

Date Collected: 07/14/17 14:30

Matrix: Solid

Date Received: 07/15/17 09:40

Percent Solids: 45.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3540C			287645	07/18/17 10:38	JT	TAL CAN
Total/NA	Analysis	8270D		1	287974	07/20/17 20:14	JMG	TAL CAN
Total/NA	Prep	3550C			119049	07/27/17 15:35	JM1	TAL BUR
Total/NA	Analysis	Organotins/GC		1	119540	08/09/17 16:07	RRM	TAL BUR
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 15:55	KLC	TAL CAN
Total/NA	Prep	3050B			287710	07/18/17 13:51	DEE	TAL CAN
Total/NA	Analysis	6010C		1	287901	07/19/17 18:02	KLC	TAL CAN
Total/NA	Prep	7471B			287711	07/18/17 16:00	DEE	TAL CAN
Total/NA	Analysis	7471B		1	287842	07/19/17 12:28	DTN	TAL CAN
Soluble	Leach	DI Leach			287742	07/18/17 17:00	JWW	TAL CAN
Soluble	Analysis	9056A		1	287743	07/19/17 12:41	LKG	TAL CAN

Laboratory References:

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396



Accreditation/Certification Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-82391-1

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-18
Connecticut	State Program	1	PH-0590	12-31-17 *
Florida	NELAP	4	E87225	06-30-18
Illinois	NELAP	5	200004	07-31-18
Kansas	NELAP	7	E-10336	01-31-18 *
Kentucky (UST)	State Program	4	58	02-23-18
Kentucky (WW)	State Program	4	98016	12-31-17 *
Minnesota	NELAP	5	039-999-348	12-31-17 *
Minnesota (Petrofund)	State Program	1	3506	07-31-17 *
Nevada	State Program	9	OH-000482008A	07-31-18
New Jersey	NELAP	2	OH001	06-30-18
New York	NELAP	2	10975	03-31-18
Ohio VAP	State Program	5	CL0024	09-14-17 *
Oregon	NELAP	10	4062	02-23-18
Pennsylvania	NELAP	3	68-00340	08-31-17 *
Texas	NELAP	6	T104704517-15-5	08-31-17 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-17 *
Washington	State Program	10	C971	01-12-18 *
West Virginia DEP	State Program	3	210	12-31-17 *
Wisconsin	State Program	5	999518190	08-31-17 *

Laboratory: TestAmerica Burlington

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Connecticut	State Program	1	PH-0751	09-30-17 *
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	NA	02-02-18
Florida	NELAP	4	E87467	06-30-18
L-A-B	DoD ELAP		L2336	02-25-20
Maine	State Program	1	VT00008	04-17-19
Minnesota	NELAP	5	050-999-436	12-31-17
New Hampshire	NELAP	1	2006	12-18-17
New Jersey	NELAP	2	VT972	06-30-18
New York	NELAP	2	10391	04-01-18
Pennsylvania	NELAP	3	68-00489	04-30-18
Rhode Island	State Program	1	LAO00298	12-30-17
US Fish & Wildlife	Federal		LE-058448-0	10-31-17
USDA	Federal		P330-11-00093	12-05-19
Vermont	State Program	1	VT-4000	12-31-17
Virginia	NELAP	3	460209	12-14-17

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Canton

3.11 CB.1



CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order # _____

ID#: _____

Page 1 of 1

Contact & Company Name: Dueñas / Andy Barner
 Telephone: 99-328-5597
 Address: _____
 City: _____ State: _____ Zip: _____
 E-mail Address: _____
 Project #: 169350010000.00013
 Sampler's Printed Name: Andy Barner
 Sampler's Signature: _____

Sample ID	Collection		Type (✓)		Matrix
	Date	Time	Comp	Grab	
HB17-01	7/14/17	14:30	✓	✓	SE
HB17-02			✓	✓	
HB17-03			✓	✓	
HB17-04			✓	✓	
HB17-05			✓	✓	
HB17-06			✓	✓	
HB17-07			✓	✓	
HB17-08			✓	✓	

Sample ID	Total PCBs		Total PAHs		Total PCBs		Total PAHs		Chloride		TriB. Wt. in		Hardness		Alkalinity		(SPLP leachate)	
	6010/7471	8270	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
HB17-01	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HB17-02	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HB17-03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HB17-04	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HB17-05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HB17-06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HB17-07	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HB17-08	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X



Special Instructions/Comments: Standard TAT

Special QA/QC Instructions (✓):

Laboratory Information and Receipt		Relinquished By		Received By		Relinquished By		Laboratory Received By	
Lab Name:		Printed Name:	Printed Name:	Printed Name:	Printed Name:	Printed Name:	Printed Name:	Printed Name:	Printed Name:
<input type="checkbox"/> Cooler packed with ice (✓)	<input type="checkbox"/> Intact <input type="checkbox"/> Not Intact	Signature:	Signature:	Signature:	Signature:	Signature:	Signature:	Signature:	Signature:
Specify Turnaround Requirements:	Sample Receipt	Firm:	Firm:	Firm:	Firm:	Firm:	Firm:	Firm:	Firm:
Shipping Tracking #:	Condition/Cooler Temp: _____	Date/Time:	Date/Time:	Date/Time:	Date/Time:	Date/Time:	Date/Time:	Date/Time:	Date/Time:

20730825 CoC AR Form 06.27.2015

Distribution: **WHITE** - Laboratory returns with results **YELLOW** - Lab copy **PINK** - Retained by Arcadis



TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 82391

Client <u>Accadis</u>	Site Name <u>Howard Bay</u>	Cooler unpacked by: <u>DO</u>
Cooler Received on <u>07/15/17</u>	Opened on <u>07/15/17</u>	
FedEx: 1 st Grd <input checked="" type="checkbox"/> UPS <input type="checkbox"/> FAS <input type="checkbox"/> Clipper <input type="checkbox"/> Client Drop Off <input type="checkbox"/> TestAmerica Courier <input type="checkbox"/> Other <input type="checkbox"/>		
Receipt After-hours: Drop-off Date/Time _____		Storage Location _____
TestAmerica Cooler # _____ Foam Box <input type="checkbox"/> Client Cooler <input checked="" type="checkbox"/> Box <input type="checkbox"/> Other <input type="checkbox"/>		
Packing material used: Bubble Wrap <input checked="" type="checkbox"/> Foam <input type="checkbox"/> Plastic Bag <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____		
COOLANT: Wet Ice <input checked="" type="checkbox"/> Blue Ice <input type="checkbox"/> Dry Ice <input type="checkbox"/> Water <input type="checkbox"/> None <input type="checkbox"/>		
1. Cooler temperature upon receipt <input type="checkbox"/> See Multiple Cooler Form		
IR GUN# IR-8 (CF -0.4 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C		
IR GUN #36 (CF +0°C) Observed Cooler Temp. <u>3.1</u> °C Corrected Cooler Temp. <u>3.1</u> °C		
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity <u>1</u> Yes No		
-Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA		
-Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No		
3. Shippers' packing slip attached to the cooler(s)? Yes No		
4. Did custody papers accompany the sample(s)? Yes No		
5. Were the custody papers relinquished & signed in the appropriate place? Yes No		
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No		
7. Did all bottles arrive in good condition (Unbroken)? Yes No		
8. Could all bottle labels be reconciled with the COC? Yes No		
9. Were correct bottle(s) used for the test(s) indicated? Yes No		
10. Sufficient quantity received to perform indicated analyses? Yes No		
11. Are these work share samples? Yes No		
If yes, Questions 11-15 have been checked at the originating laboratory.		
11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# <u>HC697954</u>		
12. Were VOAs on the COC? Yes No		
13. Were air bubbles >6 mm in any VOA vials? Larger than this. Yes No NA		
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No		
15. Was a LL Hg or Me Hg trip blank present? Yes No		
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____		
Concerning _____		

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES	Samples processed by: _____
<hr/>	

17. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

18. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

Ref: SOP-NC-SC-0005, Sample Receiving
 \\acorp\corp\QA\QA_Facilities\Canton-QA\Document-Management\Work-Instruction\Word Version Work Instructions\WT-NC-099-052317 Cooler Receipt Form.doc.djl

Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 240-82391-1

Login Number: 82391

List Source: TestAmerica Burlington

List Number: 2

List Creation: 07/18/17 12:41 PM

Creator: Lavigne, Scott M

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.2°C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



STEP 1 - SPLP



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

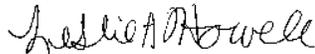
ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-81845-1
Client Project/Site: Howard's Bay
Revision: 1

For:
ARCADIS U.S. Inc
4915 Prospectus Drive
Suite F
Durham, North Carolina 27713

Attn: Andy Baumeister



Authorized for release by:
1/19/2018 10:46:59 AM

Leslie Howell, Project Manager I
(330)497-9396
leslie.howell@testamericainc.com

LINKS

Review your project
results through
Total Access

Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

- 1
- 2
- 3
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- 5
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Definitions/Glossary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Semi VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
cn	Refer to Case Narrative for further detail

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Job ID: 240-81845-1

Laboratory: TestAmerica Canton

Narrative

Job Narrative
240-81845-1
REVISED

Comments

Revised report 1-19-18: report was revised to remove the chain of custody that was mistakenly included with the original versions of the reports.

The Organotins analysis was performed at the TestAmerica Burlington Laboratory.

Receipt

The samples were received on 7/1/2017 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.4° C.

GC/MS Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA

Method(s) Organotins/GC: The laboratory control sample and/or the laboratory control sample duplicate (LCS/LCSD) for preparation batch 200-118369 and 200-118488 and analytical batch 200-118670 recovered outside control limits for the following analyte: Monobutyltin. Monobutyltin has been identified as a poor performing analyte when analyzed using this method; therefore, re-extraction/re-analysis was not performed.

In addition, the analysis for Organotins by SPLP/3510C is a deviation from the laboratory's Standard Operating Procedure and the suitability of the method for extraction of this compound is unknown.

The laboratory control limits are not based on historical performance and do not indicate expected performance of this analyte by this method. The laboratory does not use the performance of Monobutyltin as the basis for acceptance of the analytical batch. All analytical results, both detects and non-detects, are considered qualitative and are therefore flagged with a "cn" qualifier. The affected samples include: (LCS 200-118369/2-B) and (LCSD 200-118369/3-B).

Method(s) Organotins/GC: The closing continuing calibration verification (CCVC) associated with batch 200-118670 recovered above the upper control limit for Tributyltin. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Method	Method Description	Protocol	Laboratory
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CAN
Organotins/GC	Organotins (GC/FPD)	TestAmerica SOP	TAL BUR
6010B	Metals (ICP)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
TestAmerica SOP = TestAmerica, Inc., Standard Operating Procedure

Laboratory References:

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990
TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396



Sample Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-81845-1	HB17-01	Solid	06/30/17 16:00	07/01/17 09:30
240-81845-2	HB17-02	Solid	06/30/17 16:00	07/01/17 09:30
240-81845-3	HB17-03	Solid	06/30/17 16:00	07/01/17 09:30
240-81845-4	HB17-04	Solid	06/30/17 16:00	07/01/17 09:30
240-81845-5	HB17-05	Solid	06/30/17 16:00	07/01/17 09:30
240-81845-6	HB17-06	Solid	06/30/17 16:00	07/01/17 09:30
240-81845-7	HB17-07	Solid	06/30/17 16:00	07/01/17 09:30
240-81845-8	HB17-08	Solid	06/30/17 16:00	07/01/17 09:30

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-01

Lab Sample ID: 240-81845-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	0.15	J	50	0.044	ug/L	1		8270C	SPLP East
Phenanthrene	0.13	J	50	0.062	ug/L	1		8270C	SPLP East
Arsenic	0.0041	J	0.050	0.0033	mg/L	1		6010B	SPLP East
Barium	0.018	J	0.50	0.0024	mg/L	1		6010B	SPLP East
Chromium	0.0014	J	0.050	0.00055	mg/L	1		6010B	SPLP East

Client Sample ID: HB17-02

Lab Sample ID: 240-81845-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	0.11	J	50	0.063	ug/L	1		8270C	SPLP East
Phenanthrene	0.31	J	50	0.062	ug/L	1		8270C	SPLP East
Barium	0.013	J	0.50	0.0024	mg/L	1		6010B	SPLP East
Cadmium	0.00033	J B	0.050	0.00029	mg/L	1		6010B	SPLP East
Chromium	0.0016	J	0.050	0.00055	mg/L	1		6010B	SPLP East

Client Sample ID: HB17-03

Lab Sample ID: 240-81845-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Phenanthrene	0.16	J	50	0.062	ug/L	1		8270C	SPLP East
Arsenic	0.0046	J	0.050	0.0033	mg/L	1		6010B	SPLP East
Barium	0.017	J	0.50	0.0024	mg/L	1		6010B	SPLP East
Cadmium	0.00037	J B	0.050	0.00029	mg/L	1		6010B	SPLP East
Chromium	0.0028	J	0.050	0.00055	mg/L	1		6010B	SPLP East
Lead	0.0039	J	0.050	0.0019	mg/L	1		6010B	SPLP East

Client Sample ID: HB17-04

Lab Sample ID: 240-81845-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoranthene	0.10	J	50	0.045	ug/L	1		8270C	SPLP East
Phenanthrene	0.18	J	50	0.062	ug/L	1		8270C	SPLP East
Pyrene	0.092	J	50	0.042	ug/L	1		8270C	SPLP East
Arsenic	0.0040	J	0.050	0.0033	mg/L	1		6010B	SPLP East
Barium	0.017	J	0.50	0.0024	mg/L	1		6010B	SPLP East
Cadmium	0.00033	J B	0.050	0.00029	mg/L	1		6010B	SPLP East
Chromium	0.0022	J	0.050	0.00055	mg/L	1		6010B	SPLP East
Lead	0.0021	J	0.050	0.0019	mg/L	1		6010B	SPLP East

Client Sample ID: HB17-05

Lab Sample ID: 240-81845-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Phenanthrene	0.19	J	50	0.062	ug/L	1		8270C	SPLP East
Arsenic	0.0037	J	0.050	0.0033	mg/L	1		6010B	SPLP East
Barium	0.021	J	0.50	0.0024	mg/L	1		6010B	SPLP East
Chromium	0.0025	J	0.050	0.00055	mg/L	1		6010B	SPLP East
Lead	0.0027	J	0.050	0.0019	mg/L	1		6010B	SPLP East

Client Sample ID: HB17-06

Lab Sample ID: 240-81845-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0036	J	0.050	0.0033	mg/L	1		6010B	SPLP East

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-06 (Continued)

Lab Sample ID: 240-81845-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.015	J	0.50	0.0024	mg/L	1		6010B	SPLP East
Cadmium	0.00033	J B	0.050	0.00029	mg/L	1		6010B	SPLP East
Chromium	0.0021	J	0.050	0.00055	mg/L	1		6010B	SPLP East

Client Sample ID: HB17-07

Lab Sample ID: 240-81845-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoranthene	0.12	J	50	0.045	ug/L	1		8270C	SPLP East
Phenanthrene	0.18	J	50	0.062	ug/L	1		8270C	SPLP East
Arsenic	0.0076	J	0.050	0.0033	mg/L	1		6010B	SPLP East
Barium	0.027	J	0.50	0.0024	mg/L	1		6010B	SPLP East
Cadmium	0.00043	J B	0.050	0.00029	mg/L	1		6010B	SPLP East
Chromium	0.0063	J	0.050	0.00055	mg/L	1		6010B	SPLP East
Lead	0.0037	J	0.050	0.0019	mg/L	1		6010B	SPLP East

Client Sample ID: HB17-08

Lab Sample ID: 240-81845-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	0.22	J	50	0.044	ug/L	1		8270C	SPLP East
Fluoranthene	0.12	J	50	0.045	ug/L	1		8270C	SPLP East
Phenanthrene	0.20	J	50	0.062	ug/L	1		8270C	SPLP East
Pyrene	0.070	J	50	0.042	ug/L	1		8270C	SPLP East
Barium	0.031	J	0.50	0.0024	mg/L	1		6010B	SPLP East
Chromium	0.00093	J	0.050	0.00055	mg/L	1		6010B	SPLP East

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-01

Date Collected: 06/30/17 16:00

Date Received: 07/01/17 09:30

Lab Sample ID: 240-81845-1

Matrix: Solid

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.15	J	50	0.044	ug/L		07/12/17 08:06	07/17/17 15:04	1
Acenaphthylene	<50		50	0.048	ug/L		07/12/17 08:06	07/17/17 15:04	1
Anthracene	<50		50	0.088	ug/L		07/12/17 08:06	07/17/17 15:04	1
Benzo[a]anthracene	<50		50	0.030	ug/L		07/12/17 08:06	07/17/17 15:04	1
Benzo[b]fluoranthene	<50		50	0.039	ug/L		07/12/17 08:06	07/17/17 15:04	1
Benzo[k]fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 15:04	1
Benzo[g,h,i]perylene	<50		50	0.046	ug/L		07/12/17 08:06	07/17/17 15:04	1
Benzo[a]pyrene	<50		50	0.051	ug/L		07/12/17 08:06	07/17/17 15:04	1
Chrysene	<50		50	0.050	ug/L		07/12/17 08:06	07/17/17 15:04	1
Dibenz(a,h)anthracene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 15:04	1
Fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 15:04	1
Fluorene	<50		50	0.041	ug/L		07/12/17 08:06	07/17/17 15:04	1
Indeno[1,2,3-cd]pyrene	<50		50	0.043	ug/L		07/12/17 08:06	07/17/17 15:04	1
1-Methylnaphthalene	<50		50	0.034	ug/L		07/12/17 08:06	07/17/17 15:04	1
Naphthalene	<50		50	0.063	ug/L		07/12/17 08:06	07/17/17 15:04	1
Phenanthrene	0.13	J	50	0.062	ug/L		07/12/17 08:06	07/17/17 15:04	1
Pyrene	<50		50	0.042	ug/L		07/12/17 08:06	07/17/17 15:04	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	67		38 - 120	07/12/17 08:06	07/17/17 15:04	1
Nitrobenzene-d5 (Surr)	58		32 - 120	07/12/17 08:06	07/17/17 15:04	1
Terphenyl-d14 (Surr)	71		23 - 127	07/12/17 08:06	07/17/17 15:04	1

Method: Organotins/GC - Organotins (GC/FPD) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<0.051		0.051	0.051	ug/Kg		07/13/17 10:55	07/18/17 17:08	1
Tributyltin	<0.045		0.045	0.045	ug/Kg		07/13/17 10:55	07/18/17 17:08	1
Dibutyltin	<0.039		0.039	0.039	ug/Kg		07/13/17 10:55	07/18/17 17:08	1
Monobutyltin	<0.62	* cn	0.62	0.62	ug/Kg		07/13/17 10:55	07/18/17 17:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tripentyltin	76		30 - 120	07/13/17 10:55	07/18/17 17:08	1

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0041	J	0.050	0.0033	mg/L		07/12/17 14:00	07/13/17 19:17	1
Barium	0.018	J	0.50	0.0024	mg/L		07/12/17 14:00	07/13/17 19:17	1
Cadmium	<0.050		0.050	0.00029	mg/L		07/12/17 14:00	07/13/17 19:17	1
Chromium	0.0014	J	0.050	0.00055	mg/L		07/12/17 14:00	07/13/17 19:17	1
Lead	<0.050		0.050	0.0019	mg/L		07/12/17 14:00	07/13/17 19:17	1
Selenium	<0.050		0.050	0.0051	mg/L		07/12/17 14:00	07/13/17 19:17	1
Silver	<0.050		0.050	0.00092	mg/L		07/12/17 14:00	07/13/17 19:17	1
Thallium	<2.0		2.0	0.0021	mg/L		07/12/17 14:00	07/13/17 19:17	1

Method: 7470A - Mercury (CVAA) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0020		0.0020	0.00013	mg/L		07/12/17 14:00	07/13/17 11:08	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-02

Lab Sample ID: 240-81845-2

Date Collected: 06/30/17 16:00

Matrix: Solid

Date Received: 07/01/17 09:30

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<50		50	0.044	ug/L		07/12/17 08:06	07/17/17 14:16	1
Acenaphthylene	<50		50	0.048	ug/L		07/12/17 08:06	07/17/17 14:16	1
Anthracene	<50		50	0.088	ug/L		07/12/17 08:06	07/17/17 14:16	1
Benzo[a]anthracene	<50		50	0.030	ug/L		07/12/17 08:06	07/17/17 14:16	1
Benzo[b]fluoranthene	<50		50	0.039	ug/L		07/12/17 08:06	07/17/17 14:16	1
Benzo[k]fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 14:16	1
Benzo[g,h,i]perylene	<50		50	0.046	ug/L		07/12/17 08:06	07/17/17 14:16	1
Benzo[a]pyrene	<50		50	0.051	ug/L		07/12/17 08:06	07/17/17 14:16	1
Chrysene	<50		50	0.050	ug/L		07/12/17 08:06	07/17/17 14:16	1
Dibenz(a,h)anthracene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 14:16	1
Fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 14:16	1
Fluorene	<50		50	0.041	ug/L		07/12/17 08:06	07/17/17 14:16	1
Indeno[1,2,3-cd]pyrene	<50		50	0.043	ug/L		07/12/17 08:06	07/17/17 14:16	1
1-Methylnaphthalene	<50		50	0.034	ug/L		07/12/17 08:06	07/17/17 14:16	1
Naphthalene	0.11	J	50	0.063	ug/L		07/12/17 08:06	07/17/17 14:16	1
Phenanthrene	0.31	J	50	0.062	ug/L		07/12/17 08:06	07/17/17 14:16	1
Pyrene	<50		50	0.042	ug/L		07/12/17 08:06	07/17/17 14:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	69		38 - 120	07/12/17 08:06	07/17/17 14:16	1
Nitrobenzene-d5 (Surr)	60		32 - 120	07/12/17 08:06	07/17/17 14:16	1
Terphenyl-d14 (Surr)	78		23 - 127	07/12/17 08:06	07/17/17 14:16	1

Method: Organotins/GC - Organotins (GC/FPD) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<0.054		0.054	0.054	ug/Kg		07/13/17 10:55	07/18/17 17:25	1
Tributyltin	<0.047		0.047	0.047	ug/Kg		07/13/17 10:55	07/18/17 17:25	1
Dibutyltin	<0.041		0.041	0.041	ug/Kg		07/13/17 10:55	07/18/17 17:25	1
Monobutyltin	<0.65	* cn	0.65	0.65	ug/Kg		07/13/17 10:55	07/18/17 17:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tripentyltin	62		30 - 120	07/13/17 10:55	07/18/17 17:25	1

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.050		0.050	0.0033	mg/L		07/12/17 14:00	07/13/17 19:21	1
Barium	0.013	J	0.50	0.0024	mg/L		07/12/17 14:00	07/13/17 19:21	1
Cadmium	0.00033	J B	0.050	0.00029	mg/L		07/12/17 14:00	07/13/17 19:21	1
Chromium	0.0016	J	0.050	0.00055	mg/L		07/12/17 14:00	07/13/17 19:21	1
Lead	<0.050		0.050	0.0019	mg/L		07/12/17 14:00	07/13/17 19:21	1
Selenium	<0.050		0.050	0.0051	mg/L		07/12/17 14:00	07/13/17 19:21	1
Silver	<0.050		0.050	0.00092	mg/L		07/12/17 14:00	07/13/17 19:21	1
Thallium	<2.0		2.0	0.0021	mg/L		07/12/17 14:00	07/13/17 19:21	1

Method: 7470A - Mercury (CVAA) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0020		0.0020	0.00013	mg/L		07/12/17 14:00	07/13/17 11:10	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-03

Lab Sample ID: 240-81845-3

Date Collected: 06/30/17 16:00

Matrix: Solid

Date Received: 07/01/17 09:30

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<50		50	0.044	ug/L		07/12/17 08:06	07/17/17 17:26	1
Acenaphthylene	<50		50	0.048	ug/L		07/12/17 08:06	07/17/17 17:26	1
Anthracene	<50		50	0.088	ug/L		07/12/17 08:06	07/17/17 17:26	1
Benzo[a]anthracene	<50		50	0.030	ug/L		07/12/17 08:06	07/17/17 17:26	1
Benzo[b]fluoranthene	<50		50	0.039	ug/L		07/12/17 08:06	07/17/17 17:26	1
Benzo[k]fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 17:26	1
Benzo[g,h,i]perylene	<50		50	0.046	ug/L		07/12/17 08:06	07/17/17 17:26	1
Benzo[a]pyrene	<50		50	0.051	ug/L		07/12/17 08:06	07/17/17 17:26	1
Chrysene	<50		50	0.050	ug/L		07/12/17 08:06	07/17/17 17:26	1
Dibenz(a,h)anthracene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 17:26	1
Fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 17:26	1
Fluorene	<50		50	0.041	ug/L		07/12/17 08:06	07/17/17 17:26	1
Indeno[1,2,3-cd]pyrene	<50		50	0.043	ug/L		07/12/17 08:06	07/17/17 17:26	1
1-Methylnaphthalene	<50		50	0.034	ug/L		07/12/17 08:06	07/17/17 17:26	1
Naphthalene	<50		50	0.063	ug/L		07/12/17 08:06	07/17/17 17:26	1
Phenanthrene	0.16	J	50	0.062	ug/L		07/12/17 08:06	07/17/17 17:26	1
Pyrene	<50		50	0.042	ug/L		07/12/17 08:06	07/17/17 17:26	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	61		38 - 120	07/12/17 08:06	07/17/17 17:26	1
Nitrobenzene-d5 (Surr)	53		32 - 120	07/12/17 08:06	07/17/17 17:26	1
Terphenyl-d14 (Surr)	76		23 - 127	07/12/17 08:06	07/17/17 17:26	1

Method: Organotins/GC - Organotins (GC/FPD) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<0.057		0.057	0.057	ug/Kg		07/13/17 10:55	07/18/17 17:42	1
Tributyltin	<0.050		0.050	0.050	ug/Kg		07/13/17 10:55	07/18/17 17:42	1
Dibutyltin	<0.043		0.043	0.043	ug/Kg		07/13/17 10:55	07/18/17 17:42	1
Monobutyltin	<0.69	* cn	0.69	0.69	ug/Kg		07/13/17 10:55	07/18/17 17:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tripentyltin	51		30 - 120	07/13/17 10:55	07/18/17 17:42	1

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0046	J	0.050	0.0033	mg/L		07/12/17 14:00	07/13/17 19:26	1
Barium	0.017	J	0.50	0.0024	mg/L		07/12/17 14:00	07/13/17 19:26	1
Cadmium	0.00037	J B	0.050	0.00029	mg/L		07/12/17 14:00	07/13/17 19:26	1
Chromium	0.0028	J	0.050	0.00055	mg/L		07/12/17 14:00	07/13/17 19:26	1
Lead	0.0039	J	0.050	0.0019	mg/L		07/12/17 14:00	07/13/17 19:26	1
Selenium	<0.050		0.050	0.0051	mg/L		07/12/17 14:00	07/13/17 19:26	1
Silver	<0.050		0.050	0.00092	mg/L		07/12/17 14:00	07/13/17 19:26	1
Thallium	<2.0		2.0	0.0021	mg/L		07/12/17 14:00	07/13/17 19:26	1

Method: 7470A - Mercury (CVAA) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0020		0.0020	0.00013	mg/L		07/12/17 14:00	07/13/17 11:12	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-04

Lab Sample ID: 240-81845-4

Date Collected: 06/30/17 16:00

Matrix: Solid

Date Received: 07/01/17 09:30

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<50		50	0.044	ug/L		07/12/17 08:06	07/17/17 17:02	1
Acenaphthylene	<50		50	0.048	ug/L		07/12/17 08:06	07/17/17 17:02	1
Anthracene	<50		50	0.088	ug/L		07/12/17 08:06	07/17/17 17:02	1
Benzo[a]anthracene	<50		50	0.030	ug/L		07/12/17 08:06	07/17/17 17:02	1
Benzo[b]fluoranthene	<50		50	0.039	ug/L		07/12/17 08:06	07/17/17 17:02	1
Benzo[k]fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 17:02	1
Benzo[g,h,i]perylene	<50		50	0.046	ug/L		07/12/17 08:06	07/17/17 17:02	1
Benzo[a]pyrene	<50		50	0.051	ug/L		07/12/17 08:06	07/17/17 17:02	1
Chrysene	<50		50	0.050	ug/L		07/12/17 08:06	07/17/17 17:02	1
Dibenz(a,h)anthracene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 17:02	1
Fluoranthene	0.10	J	50	0.045	ug/L		07/12/17 08:06	07/17/17 17:02	1
Fluorene	<50		50	0.041	ug/L		07/12/17 08:06	07/17/17 17:02	1
Indeno[1,2,3-cd]pyrene	<50		50	0.043	ug/L		07/12/17 08:06	07/17/17 17:02	1
1-Methylnaphthalene	<50		50	0.034	ug/L		07/12/17 08:06	07/17/17 17:02	1
Naphthalene	<50		50	0.063	ug/L		07/12/17 08:06	07/17/17 17:02	1
Phenanthrene	0.18	J	50	0.062	ug/L		07/12/17 08:06	07/17/17 17:02	1
Pyrene	0.092	J	50	0.042	ug/L		07/12/17 08:06	07/17/17 17:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	66		38 - 120	07/12/17 08:06	07/17/17 17:02	1
Nitrobenzene-d5 (Surr)	58		32 - 120	07/12/17 08:06	07/17/17 17:02	1
Terphenyl-d14 (Surr)	67		23 - 127	07/12/17 08:06	07/17/17 17:02	1

Method: Organotins/GC - Organotins (GC/FPD) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<0.052		0.052	0.052	ug/Kg		07/13/17 10:55	07/18/17 17:59	1
Tributyltin	<0.045		0.045	0.045	ug/Kg		07/13/17 10:55	07/18/17 17:59	1
Dibutyltin	<0.039		0.039	0.039	ug/Kg		07/13/17 10:55	07/18/17 17:59	1
Monobutyltin	<0.63	* cn	0.63	0.63	ug/Kg		07/13/17 10:55	07/18/17 17:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tripentyltin	90		30 - 120	07/13/17 10:55	07/18/17 17:59	1

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0040	J	0.050	0.0033	mg/L		07/12/17 14:00	07/13/17 19:38	1
Barium	0.017	J	0.50	0.0024	mg/L		07/12/17 14:00	07/13/17 19:38	1
Cadmium	0.00033	J B	0.050	0.00029	mg/L		07/12/17 14:00	07/13/17 19:38	1
Chromium	0.0022	J	0.050	0.00055	mg/L		07/12/17 14:00	07/13/17 19:38	1
Lead	0.0021	J	0.050	0.0019	mg/L		07/12/17 14:00	07/13/17 19:38	1
Selenium	<0.050		0.050	0.0051	mg/L		07/12/17 14:00	07/13/17 19:38	1
Silver	<0.050		0.050	0.00092	mg/L		07/12/17 14:00	07/13/17 19:38	1
Thallium	<2.0		2.0	0.0021	mg/L		07/12/17 14:00	07/13/17 19:38	1

Method: 7470A - Mercury (CVAA) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0020		0.0020	0.00013	mg/L		07/12/17 14:00	07/13/17 11:14	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-05

Date Collected: 06/30/17 16:00

Date Received: 07/01/17 09:30

Lab Sample ID: 240-81845-5

Matrix: Solid

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<50		50	0.044	ug/L		07/12/17 08:06	07/17/17 16:39	1
Acenaphthylene	<50		50	0.048	ug/L		07/12/17 08:06	07/17/17 16:39	1
Anthracene	<50		50	0.088	ug/L		07/12/17 08:06	07/17/17 16:39	1
Benzo[a]anthracene	<50		50	0.030	ug/L		07/12/17 08:06	07/17/17 16:39	1
Benzo[b]fluoranthene	<50		50	0.039	ug/L		07/12/17 08:06	07/17/17 16:39	1
Benzo[k]fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 16:39	1
Benzo[g,h,i]perylene	<50		50	0.046	ug/L		07/12/17 08:06	07/17/17 16:39	1
Benzo[a]pyrene	<50		50	0.051	ug/L		07/12/17 08:06	07/17/17 16:39	1
Chrysene	<50		50	0.050	ug/L		07/12/17 08:06	07/17/17 16:39	1
Dibenz(a,h)anthracene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 16:39	1
Fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 16:39	1
Fluorene	<50		50	0.041	ug/L		07/12/17 08:06	07/17/17 16:39	1
Indeno[1,2,3-cd]pyrene	<50		50	0.043	ug/L		07/12/17 08:06	07/17/17 16:39	1
1-Methylnaphthalene	<50		50	0.034	ug/L		07/12/17 08:06	07/17/17 16:39	1
Naphthalene	<50		50	0.063	ug/L		07/12/17 08:06	07/17/17 16:39	1
Phenanthrene	0.19	J	50	0.062	ug/L		07/12/17 08:06	07/17/17 16:39	1
Pyrene	<50		50	0.042	ug/L		07/12/17 08:06	07/17/17 16:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	58		38 - 120	07/12/17 08:06	07/17/17 16:39	1
Nitrobenzene-d5 (Surr)	52		32 - 120	07/12/17 08:06	07/17/17 16:39	1
Terphenyl-d14 (Surr)	75		23 - 127	07/12/17 08:06	07/17/17 16:39	1

Method: Organotins/GC - Organotins (GC/FPD) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<0.053		0.053	0.053	ug/Kg		07/13/17 10:55	07/18/17 18:15	1
Tributyltin	<0.047		0.047	0.047	ug/Kg		07/13/17 10:55	07/18/17 18:15	1
Dibutyltin	<0.041		0.041	0.041	ug/Kg		07/13/17 10:55	07/18/17 18:15	1
Monobutyltin	<0.65	* cn	0.65	0.65	ug/Kg		07/13/17 10:55	07/18/17 18:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tripentyltin	54		30 - 120	07/13/17 10:55	07/18/17 18:15	1

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0037	J	0.050	0.0033	mg/L		07/12/17 14:00	07/13/17 19:43	1
Barium	0.021	J	0.50	0.0024	mg/L		07/12/17 14:00	07/13/17 19:43	1
Cadmium	<0.050		0.050	0.00029	mg/L		07/12/17 14:00	07/13/17 19:43	1
Chromium	0.0025	J	0.050	0.00055	mg/L		07/12/17 14:00	07/13/17 19:43	1
Lead	0.0027	J	0.050	0.0019	mg/L		07/12/17 14:00	07/13/17 19:43	1
Selenium	<0.050		0.050	0.0051	mg/L		07/12/17 14:00	07/13/17 19:43	1
Silver	<0.050		0.050	0.00092	mg/L		07/12/17 14:00	07/13/17 19:43	1
Thallium	<2.0		2.0	0.0021	mg/L		07/12/17 14:00	07/13/17 19:43	1

Method: 7470A - Mercury (CVAA) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0020		0.0020	0.00013	mg/L		07/12/17 14:00	07/13/17 11:16	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-06

Lab Sample ID: 240-81845-6

Date Collected: 06/30/17 16:00

Matrix: Solid

Date Received: 07/01/17 09:30

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<50		50	0.044	ug/L		07/12/17 08:06	07/17/17 16:15	1
Acenaphthylene	<50		50	0.048	ug/L		07/12/17 08:06	07/17/17 16:15	1
Anthracene	<50		50	0.088	ug/L		07/12/17 08:06	07/17/17 16:15	1
Benzo[a]anthracene	<50		50	0.030	ug/L		07/12/17 08:06	07/17/17 16:15	1
Benzo[b]fluoranthene	<50		50	0.039	ug/L		07/12/17 08:06	07/17/17 16:15	1
Benzo[k]fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 16:15	1
Benzo[g,h,i]perylene	<50		50	0.046	ug/L		07/12/17 08:06	07/17/17 16:15	1
Benzo[a]pyrene	<50		50	0.051	ug/L		07/12/17 08:06	07/17/17 16:15	1
Chrysene	<50		50	0.050	ug/L		07/12/17 08:06	07/17/17 16:15	1
Dibenz(a,h)anthracene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 16:15	1
Fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 16:15	1
Fluorene	<50		50	0.041	ug/L		07/12/17 08:06	07/17/17 16:15	1
Indeno[1,2,3-cd]pyrene	<50		50	0.043	ug/L		07/12/17 08:06	07/17/17 16:15	1
1-Methylnaphthalene	<50		50	0.034	ug/L		07/12/17 08:06	07/17/17 16:15	1
Naphthalene	<50		50	0.063	ug/L		07/12/17 08:06	07/17/17 16:15	1
Phenanthrene	<50		50	0.062	ug/L		07/12/17 08:06	07/17/17 16:15	1
Pyrene	<50		50	0.042	ug/L		07/12/17 08:06	07/17/17 16:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	68		38 - 120	07/12/17 08:06	07/17/17 16:15	1
Nitrobenzene-d5 (Surr)	60		32 - 120	07/12/17 08:06	07/17/17 16:15	1
Terphenyl-d14 (Surr)	71		23 - 127	07/12/17 08:06	07/17/17 16:15	1

Method: Organotins/GC - Organotins (GC/FPD) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<0.053		0.053	0.053	ug/Kg		07/13/17 10:55	07/18/17 18:32	1
Tributyltin	<0.047		0.047	0.047	ug/Kg		07/13/17 10:55	07/18/17 18:32	1
Dibutyltin	<0.041		0.041	0.041	ug/Kg		07/13/17 10:55	07/18/17 18:32	1
Monobutyltin	<0.65	* cn	0.65	0.65	ug/Kg		07/13/17 10:55	07/18/17 18:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tripentyltin	72		30 - 120	07/13/17 10:55	07/18/17 18:32	1

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0036	J	0.050	0.0033	mg/L		07/12/17 14:00	07/13/17 19:47	1
Barium	0.015	J	0.50	0.0024	mg/L		07/12/17 14:00	07/13/17 19:47	1
Cadmium	0.00033	J B	0.050	0.00029	mg/L		07/12/17 14:00	07/13/17 19:47	1
Chromium	0.0021	J	0.050	0.00055	mg/L		07/12/17 14:00	07/13/17 19:47	1
Lead	<0.050		0.050	0.0019	mg/L		07/12/17 14:00	07/13/17 19:47	1
Selenium	<0.050		0.050	0.0051	mg/L		07/12/17 14:00	07/13/17 19:47	1
Silver	<0.050		0.050	0.00092	mg/L		07/12/17 14:00	07/13/17 19:47	1
Thallium	<2.0		2.0	0.0021	mg/L		07/12/17 14:00	07/13/17 19:47	1

Method: 7470A - Mercury (CVAA) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0020		0.0020	0.00013	mg/L		07/12/17 14:00	07/13/17 11:18	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-07

Lab Sample ID: 240-81845-7

Date Collected: 06/30/17 16:00

Matrix: Solid

Date Received: 07/01/17 09:30

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<50		50	0.044	ug/L		07/12/17 08:06	07/17/17 15:51	1
Acenaphthylene	<50		50	0.048	ug/L		07/12/17 08:06	07/17/17 15:51	1
Anthracene	<50		50	0.088	ug/L		07/12/17 08:06	07/17/17 15:51	1
Benzo[a]anthracene	<50		50	0.030	ug/L		07/12/17 08:06	07/17/17 15:51	1
Benzo[b]fluoranthene	<50		50	0.039	ug/L		07/12/17 08:06	07/17/17 15:51	1
Benzo[k]fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 15:51	1
Benzo[g,h,i]perylene	<50		50	0.046	ug/L		07/12/17 08:06	07/17/17 15:51	1
Benzo[a]pyrene	<50		50	0.051	ug/L		07/12/17 08:06	07/17/17 15:51	1
Chrysene	<50		50	0.050	ug/L		07/12/17 08:06	07/17/17 15:51	1
Dibenz(a,h)anthracene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 15:51	1
Fluoranthene	0.12	J	50	0.045	ug/L		07/12/17 08:06	07/17/17 15:51	1
Fluorene	<50		50	0.041	ug/L		07/12/17 08:06	07/17/17 15:51	1
Indeno[1,2,3-cd]pyrene	<50		50	0.043	ug/L		07/12/17 08:06	07/17/17 15:51	1
1-Methylnaphthalene	<50		50	0.034	ug/L		07/12/17 08:06	07/17/17 15:51	1
Naphthalene	<50		50	0.063	ug/L		07/12/17 08:06	07/17/17 15:51	1
Phenanthrene	0.18	J	50	0.062	ug/L		07/12/17 08:06	07/17/17 15:51	1
Pyrene	<50		50	0.042	ug/L		07/12/17 08:06	07/17/17 15:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	71		38 - 120	07/12/17 08:06	07/17/17 15:51	1
Nitrobenzene-d5 (Surr)	61		32 - 120	07/12/17 08:06	07/17/17 15:51	1
Terphenyl-d14 (Surr)	77		23 - 127	07/12/17 08:06	07/17/17 15:51	1

Method: Organotins/GC - Organotins (GC/FPD) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<0.054		0.054	0.054	ug/Kg		07/13/17 10:55	07/18/17 18:49	1
Tributyltin	<0.047		0.047	0.047	ug/Kg		07/13/17 10:55	07/18/17 18:49	1
Dibutyltin	<0.041		0.041	0.041	ug/Kg		07/13/17 10:55	07/18/17 18:49	1
Monobutyltin	<0.65	* cn	0.65	0.65	ug/Kg		07/13/17 10:55	07/18/17 18:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tripentyltin	74		30 - 120	07/13/17 10:55	07/18/17 18:49	1

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0076	J	0.050	0.0033	mg/L		07/12/17 14:00	07/13/17 18:56	1
Barium	0.027	J	0.50	0.0024	mg/L		07/12/17 14:00	07/13/17 18:56	1
Cadmium	0.00043	J B	0.050	0.00029	mg/L		07/12/17 14:00	07/13/17 18:56	1
Chromium	0.0063	J	0.050	0.00055	mg/L		07/12/17 14:00	07/13/17 18:56	1
Lead	0.0037	J	0.050	0.0019	mg/L		07/12/17 14:00	07/13/17 18:56	1
Selenium	<0.050		0.050	0.0051	mg/L		07/12/17 14:00	07/13/17 18:56	1
Silver	<0.050		0.050	0.00092	mg/L		07/12/17 14:00	07/13/17 18:56	1
Thallium	<2.0		2.0	0.0021	mg/L		07/12/17 14:00	07/13/17 18:56	1

Method: 7470A - Mercury (CVAA) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0020		0.0020	0.00013	mg/L		07/12/17 14:00	07/13/17 10:56	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-08

Lab Sample ID: 240-81845-8

Date Collected: 06/30/17 16:00

Matrix: Solid

Date Received: 07/01/17 09:30

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.22	J	50	0.044	ug/L		07/12/17 08:06	07/17/17 15:27	1
Acenaphthylene	<50		50	0.048	ug/L		07/12/17 08:06	07/17/17 15:27	1
Anthracene	<50		50	0.088	ug/L		07/12/17 08:06	07/17/17 15:27	1
Benzo[a]anthracene	<50		50	0.030	ug/L		07/12/17 08:06	07/17/17 15:27	1
Benzo[b]fluoranthene	<50		50	0.039	ug/L		07/12/17 08:06	07/17/17 15:27	1
Benzo[k]fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 15:27	1
Benzo[g,h,i]perylene	<50		50	0.046	ug/L		07/12/17 08:06	07/17/17 15:27	1
Benzo[a]pyrene	<50		50	0.051	ug/L		07/12/17 08:06	07/17/17 15:27	1
Chrysene	<50		50	0.050	ug/L		07/12/17 08:06	07/17/17 15:27	1
Dibenz(a,h)anthracene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 15:27	1
Fluoranthene	0.12	J	50	0.045	ug/L		07/12/17 08:06	07/17/17 15:27	1
Fluorene	<50		50	0.041	ug/L		07/12/17 08:06	07/17/17 15:27	1
Indeno[1,2,3-cd]pyrene	<50		50	0.043	ug/L		07/12/17 08:06	07/17/17 15:27	1
1-Methylnaphthalene	<50		50	0.034	ug/L		07/12/17 08:06	07/17/17 15:27	1
Naphthalene	<50		50	0.063	ug/L		07/12/17 08:06	07/17/17 15:27	1
Phenanthrene	0.20	J	50	0.062	ug/L		07/12/17 08:06	07/17/17 15:27	1
Pyrene	0.070	J	50	0.042	ug/L		07/12/17 08:06	07/17/17 15:27	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	62		38 - 120				07/12/17 08:06	07/17/17 15:27	1
Nitrobenzene-d5 (Surr)	57		32 - 120				07/12/17 08:06	07/17/17 15:27	1
Terphenyl-d14 (Surr)	70		23 - 127				07/12/17 08:06	07/17/17 15:27	1

Method: Organotins/GC - Organotins (GC/FPD) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<0.052		0.052	0.052	ug/Kg		07/13/17 10:55	07/18/17 19:06	1
Tributyltin	<0.046		0.046	0.046	ug/Kg		07/13/17 10:55	07/18/17 19:06	1
Dibutyltin	<0.040		0.040	0.040	ug/Kg		07/13/17 10:55	07/18/17 19:06	1
Monobutyltin	<0.63	* cn	0.63	0.63	ug/Kg		07/13/17 10:55	07/18/17 19:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	82		30 - 120				07/13/17 10:55	07/18/17 19:06	1

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.050		0.050	0.0033	mg/L		07/12/17 14:00	07/13/17 19:51	1
Barium	0.031	J	0.50	0.0024	mg/L		07/12/17 14:00	07/13/17 19:51	1
Cadmium	<0.050		0.050	0.00029	mg/L		07/12/17 14:00	07/13/17 19:51	1
Chromium	0.00093	J	0.050	0.00055	mg/L		07/12/17 14:00	07/13/17 19:51	1
Lead	<0.050		0.050	0.0019	mg/L		07/12/17 14:00	07/13/17 19:51	1
Selenium	<0.050		0.050	0.0051	mg/L		07/12/17 14:00	07/13/17 19:51	1
Silver	<0.050		0.050	0.00092	mg/L		07/12/17 14:00	07/13/17 19:51	1
Thallium	<2.0		2.0	0.0021	mg/L		07/12/17 14:00	07/13/17 19:51	1

Method: 7470A - Mercury (CVAA) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0020		0.0020	0.00013	mg/L		07/12/17 14:00	07/13/17 11:20	1

TestAmerica Canton

Surrogate Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		FBP (38-120)	NBZ (32-120)	TPH (23-127)
LCS 240-286813/11-A	Lab Control Sample	72	65	79
MB 240-286813/10-A	Method Blank	66	60	79

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)

NBZ = Nitrobenzene-d5 (Surr)

TPH = Terphenyl-d14 (Surr)

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: SPLP East

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		FBP (38-120)	NBZ (32-120)	TPH (23-127)
240-81845-1	HB17-01	67	58	71
240-81845-2	HB17-02	69	60	78
240-81845-2 MS	HB17-02	76	68	64
240-81845-3	HB17-03	61	53	76
240-81845-4	HB17-04	66	58	67
240-81845-5	HB17-05	58	52	75
240-81845-6	HB17-06	68	60	71
240-81845-7	HB17-07	71	61	77
240-81845-8	HB17-08	62	57	70

Surrogate Legend

FBP = 2-Fluorobiphenyl (Surr)

NBZ = Nitrobenzene-d5 (Surr)

TPH = Terphenyl-d14 (Surr)

Method: Organotins/GC - Organotins (GC/FPD)

Matrix: Solid

Prep Type: SPLP East

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TPT2
		(30-120)
240-81845-1	HB17-01	76
240-81845-2	HB17-02	62
240-81845-3	HB17-03	51
240-81845-4	HB17-04	90
240-81845-5	HB17-05	54
240-81845-6	HB17-06	72
240-81845-7	HB17-07	74
240-81845-8	HB17-08	82
LCS 200-118369/2-B	Lab Control Sample	74
LCSD 200-118369/3-B	Lab Control Sample Dup	75
MB 200-118369/1-B	Method Blank	68

Surrogate Legend

TPT = Tripentyltin

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-286813/10-A
Matrix: Solid
Analysis Batch: 287454

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 286813

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<50		50	0.044	ug/L		07/12/17 08:06	07/17/17 11:54	1
Acenaphthylene	<50		50	0.048	ug/L		07/12/17 08:06	07/17/17 11:54	1
Anthracene	<50		50	0.088	ug/L		07/12/17 08:06	07/17/17 11:54	1
Benzo[a]anthracene	<50		50	0.030	ug/L		07/12/17 08:06	07/17/17 11:54	1
Benzo[b]fluoranthene	<50		50	0.039	ug/L		07/12/17 08:06	07/17/17 11:54	1
Benzo[k]fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 11:54	1
Benzo[g,h,i]perylene	<50		50	0.046	ug/L		07/12/17 08:06	07/17/17 11:54	1
Benzo[a]pyrene	<50		50	0.051	ug/L		07/12/17 08:06	07/17/17 11:54	1
Chrysene	<50		50	0.050	ug/L		07/12/17 08:06	07/17/17 11:54	1
Dibenz(a,h)anthracene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 11:54	1
Fluoranthene	<50		50	0.045	ug/L		07/12/17 08:06	07/17/17 11:54	1
Fluorene	<50		50	0.041	ug/L		07/12/17 08:06	07/17/17 11:54	1
Indeno[1,2,3-cd]pyrene	<50		50	0.043	ug/L		07/12/17 08:06	07/17/17 11:54	1
1-Methylnaphthalene	<50		50	0.034	ug/L		07/12/17 08:06	07/17/17 11:54	1
Naphthalene	<50		50	0.063	ug/L		07/12/17 08:06	07/17/17 11:54	1
Phenanthrene	<50		50	0.062	ug/L		07/12/17 08:06	07/17/17 11:54	1
Pyrene	<50		50	0.042	ug/L		07/12/17 08:06	07/17/17 11:54	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl (Surr)	66		38 - 120	07/12/17 08:06	07/17/17 11:54	1
Nitrobenzene-d5 (Surr)	60		32 - 120	07/12/17 08:06	07/17/17 11:54	1
Terphenyl-d14 (Surr)	79		23 - 127	07/12/17 08:06	07/17/17 11:54	1

Lab Sample ID: LCS 240-286813/11-A
Matrix: Solid
Analysis Batch: 287454

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 286813

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Acenaphthene	20.0	14.2	J	ug/L		71	54 - 120
Acenaphthylene	20.0	14.1	J	ug/L		71	53 - 120
Anthracene	20.0	16.3	J	ug/L		82	56 - 120
Benzo[a]anthracene	20.0	15.1	J	ug/L		76	54 - 120
Benzo[b]fluoranthene	20.0	14.5	J	ug/L		73	53 - 120
Benzo[k]fluoranthene	20.0	14.2	J	ug/L		71	55 - 120
Benzo[g,h,i]perylene	20.0	13.0	J	ug/L		65	55 - 120
Benzo[a]pyrene	20.0	14.7	J	ug/L		73	54 - 120
Chrysene	20.0	15.1	J	ug/L		75	56 - 120
Dibenz(a,h)anthracene	20.0	13.9	J	ug/L		69	52 - 120
Fluoranthene	20.0	16.1	J	ug/L		80	58 - 120
Fluorene	20.0	14.8	J	ug/L		74	56 - 120
Indeno[1,2,3-cd]pyrene	20.0	13.5	J	ug/L		68	54 - 120
1-Methylnaphthalene	20.0	14.8	J	ug/L		74	54 - 120
Naphthalene	20.0	13.8	J	ug/L		69	53 - 120
Phenanthrene	20.0	16.0	J	ug/L		80	55 - 120
Pyrene	20.0	16.0	J	ug/L		80	57 - 120

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-286813/11-A
Matrix: Solid
Analysis Batch: 287454

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 286813

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2-Fluorobiphenyl (Surr)	72		38 - 120
Nitrobenzene-d5 (Surr)	65		32 - 120
Terphenyl-d14 (Surr)	79		23 - 127

Lab Sample ID: 240-81845-2 MS
Matrix: Solid
Analysis Batch: 287454

Client Sample ID: HB17-02
Prep Type: SPLP East
Prep Batch: 286813

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	Limits
				Result	Qualifier				
Acenaphthene	<50		20.0	13.9	J	ug/L		70	35 - 120
Acenaphthylene	<50		20.0	14.1	J	ug/L		71	36 - 120
Anthracene	<50		20.0	14.7	J	ug/L		74	35 - 120
Benzo[a]anthracene	<50		20.0	12.4	J	ug/L		62	16 - 120
Benzo[b]fluoranthene	<50		20.0	10.9	J	ug/L		55	10 - 120
Benzo[k]fluoranthene	<50		20.0	10.2	J	ug/L		51	10 - 120
Benzo[g,h,i]perylene	<50		20.0	10.1	J	ug/L		51	10 - 120
Benzo[a]pyrene	<50		20.0	10.8	J	ug/L		54	10 - 120
Chrysene	<50		20.0	11.9	J	ug/L		60	14 - 120
Dibenz(a,h)anthracene	<50		20.0	10.3	J	ug/L		52	10 - 120
Fluoranthene	<50		20.0	14.3	J	ug/L		71	28 - 120
Fluorene	<50		20.0	14.5	J	ug/L		72	36 - 120
Indeno[1,2,3-cd]pyrene	<50		20.0	10.1	J	ug/L		51	10 - 120
1-Methylnaphthalene	<50		20.0	14.3	J	ug/L		71	48 - 120
Naphthalene	0.11	J	20.0	13.8	J	ug/L		69	32 - 120
Phenanthrene	0.31	J	20.0	14.9	J	ug/L		73	36 - 120
Pyrene	<50		20.0	14.2	J	ug/L		71	28 - 120

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
2-Fluorobiphenyl (Surr)	76		38 - 120
Nitrobenzene-d5 (Surr)	68		32 - 120
Terphenyl-d14 (Surr)	64		23 - 127

Method: Organotins/GC - Organotins (GC/FPD)

Lab Sample ID: MB 200-118369/1-B
Matrix: Solid
Analysis Batch: 118670

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 118488

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Tetrabutyltin	<0.051		0.051	0.051	ug/Kg		07/13/17 10:55	07/18/17 16:18	1
Tributyltin	<0.045		0.045	0.045	ug/Kg		07/13/17 10:55	07/18/17 16:18	1
Dibutyltin	<0.039		0.039	0.039	ug/Kg		07/13/17 10:55	07/18/17 16:18	1
Monobutyltin	<0.62	cn	0.62	0.62	ug/Kg		07/13/17 10:55	07/18/17 16:18	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Triphenyltin	68		30 - 120	07/13/17 10:55	07/18/17 16:18	1

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Method: Organotins/GC - Organotins (GC/FPD) (Continued)

Lab Sample ID: LCS 200-118369/2-B
Matrix: Solid
Analysis Batch: 118670

Client Sample ID: Lab Control Sample
Prep Type: SPLP East
Prep Batch: 118488

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Tetrabutyltin	0.490	0.477		ug/Kg		97	30 - 160
Tributyltin	0.436	0.262		ug/Kg		60	30 - 160
Dibutyltin	0.377	0.361		ug/Kg		96	30 - 160
Monobutyltin	1.52	<0.61	* cn	ug/Kg		0	10 - 48

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Tripentyltin	74		30 - 120

Lab Sample ID: LCSD 200-118369/3-B
Matrix: Solid
Analysis Batch: 118670

Client Sample ID: Lab Control Sample Dup
Prep Type: SPLP East
Prep Batch: 118488

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Tetrabutyltin	0.481	0.513		ug/Kg		107	30 - 160	7	30
Tributyltin	0.428	0.232		ug/Kg		54	30 - 160	12	30
Dibutyltin	0.370	0.285		ug/Kg		77	30 - 160	24	30
Monobutyltin	1.49	<0.60	* cn	ug/Kg		0	10 - 48	NC	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Tripentyltin	75		30 - 120

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 240-286852/2-A
Matrix: Solid
Analysis Batch: 287191

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 286852

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.050		0.050	0.0033	mg/L		07/12/17 14:00	07/13/17 18:47	1
Barium	<0.50		0.50	0.0024	mg/L		07/12/17 14:00	07/13/17 18:47	1
Cadmium	<0.050		0.050	0.00029	mg/L		07/12/17 14:00	07/13/17 18:47	1
Chromium	<0.050		0.050	0.00055	mg/L		07/12/17 14:00	07/13/17 18:47	1
Lead	<0.050		0.050	0.0019	mg/L		07/12/17 14:00	07/13/17 18:47	1
Selenium	<0.050		0.050	0.0051	mg/L		07/12/17 14:00	07/13/17 18:47	1
Silver	<0.050		0.050	0.00092	mg/L		07/12/17 14:00	07/13/17 18:47	1
Thallium	<2.0		2.0	0.0021	mg/L		07/12/17 14:00	07/13/17 18:47	1

Lab Sample ID: LCS 240-286852/3-A
Matrix: Solid
Analysis Batch: 287191

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 286852

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	2.00	2.08		mg/L		104	50 - 150
Barium	2.00	2.03		mg/L		101	50 - 150
Cadmium	0.0500	0.0517		mg/L		103	50 - 150
Chromium	0.200	0.198		mg/L		99	50 - 150
Lead	0.500	0.490		mg/L		98	50 - 150

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCS 240-286852/3-A
Matrix: Solid
Analysis Batch: 287191

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 286852
%Rec.

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Selenium	2.00	2.04		mg/L		102	50 - 150
Silver	0.0500	0.0505		mg/L		101	50 - 150
Thallium	2.00	1.96	J	mg/L		98	50 - 150

Lab Sample ID: LB 240-286747/1-B
Matrix: Solid
Analysis Batch: 287191

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 286852

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.050		0.050	0.0033	mg/L		07/12/17 14:00	07/13/17 18:35	1
Barium	<0.50		0.50	0.0024	mg/L		07/12/17 14:00	07/13/17 18:35	1
Cadmium	0.000291	J	0.050	0.00029	mg/L		07/12/17 14:00	07/13/17 18:35	1
Chromium	<0.050		0.050	0.00055	mg/L		07/12/17 14:00	07/13/17 18:35	1
Lead	<0.050		0.050	0.0019	mg/L		07/12/17 14:00	07/13/17 18:35	1
Selenium	<0.050		0.050	0.0051	mg/L		07/12/17 14:00	07/13/17 18:35	1
Silver	<0.050		0.050	0.00092	mg/L		07/12/17 14:00	07/13/17 18:35	1
Thallium	<2.0		2.0	0.0021	mg/L		07/12/17 14:00	07/13/17 18:35	1

Lab Sample ID: 240-81845-7 MS
Matrix: Solid
Analysis Batch: 287191

Client Sample ID: HB17-07
Prep Type: SPLP East
Prep Batch: 286852
%Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	0.0076	J	5.00	5.04		mg/L		101	75 - 125
Barium	0.027	J	50.0	48.6		mg/L		97	75 - 125
Cadmium	0.00043	J B	1.00	1.02		mg/L		102	75 - 125
Chromium	0.0063	J	5.00	4.94		mg/L		99	75 - 125
Lead	0.0037	J	5.00	5.03		mg/L		101	75 - 125
Selenium	<0.050		1.00	1.02		mg/L		102	75 - 125
Silver	<0.050		1.00	1.00		mg/L		100	75 - 125
Thallium	<2.0		2.00	2.01	J	mg/L		101	75 - 125

Lab Sample ID: 240-81845-7 MSD
Matrix: Solid
Analysis Batch: 287191

Client Sample ID: HB17-07
Prep Type: SPLP East
Prep Batch: 286852
%Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	0.0076	J	5.00	5.07		mg/L		101	75 - 125	1	20
Barium	0.027	J	50.0	49.3		mg/L		99	75 - 125	1	20
Cadmium	0.00043	J B	1.00	1.03		mg/L		103	75 - 125	1	20
Chromium	0.0063	J	5.00	4.94		mg/L		99	75 - 125	0	20
Lead	0.0037	J	5.00	5.08		mg/L		102	75 - 125	1	20
Selenium	<0.050		1.00	1.02		mg/L		102	75 - 125	0	20
Silver	<0.050		1.00	1.00		mg/L		100	75 - 125	0	20
Thallium	<2.0		2.00	2.01	J	mg/L		100	75 - 125	0	20

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-286858/2-A
Matrix: Solid
Analysis Batch: 287165

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 286858

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0020		0.0020	0.00013	mg/L		07/12/17 14:00	07/13/17 10:53	1

Lab Sample ID: LCS 240-286858/3-A
Matrix: Solid
Analysis Batch: 287165

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 286858

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	0.00500	0.00481		mg/L		96	80 - 120

Lab Sample ID: LB 240-286747/1-C
Matrix: Solid
Analysis Batch: 287165

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 286858

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.0020		0.0020	0.00013	mg/L		07/12/17 14:00	07/13/17 10:51	1

Lab Sample ID: 240-81845-7 MS
Matrix: Solid
Analysis Batch: 287165

Client Sample ID: HB17-07
Prep Type: SPLP East
Prep Batch: 286858

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	<0.0020		0.00500	0.00500		mg/L		100	80 - 120

Lab Sample ID: 240-81845-7 MSD
Matrix: Solid
Analysis Batch: 287165

Client Sample ID: HB17-07
Prep Type: SPLP East
Prep Batch: 286858

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	<0.0020		0.00500	0.00494		mg/L		99	80 - 120	1	20

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

GC/MS Semi VOA

Leach Batch: 286747

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81845-1	HB17-01	SPLP East	Solid	1312	
240-81845-2	HB17-02	SPLP East	Solid	1312	
240-81845-3	HB17-03	SPLP East	Solid	1312	
240-81845-4	HB17-04	SPLP East	Solid	1312	
240-81845-5	HB17-05	SPLP East	Solid	1312	
240-81845-6	HB17-06	SPLP East	Solid	1312	
240-81845-7	HB17-07	SPLP East	Solid	1312	
240-81845-8	HB17-08	SPLP East	Solid	1312	
240-81845-2 MS	HB17-02	SPLP East	Solid	1312	

Prep Batch: 286813

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81845-1	HB17-01	SPLP East	Solid	3510C	286747
240-81845-2	HB17-02	SPLP East	Solid	3510C	286747
240-81845-3	HB17-03	SPLP East	Solid	3510C	286747
240-81845-4	HB17-04	SPLP East	Solid	3510C	286747
240-81845-5	HB17-05	SPLP East	Solid	3510C	286747
240-81845-6	HB17-06	SPLP East	Solid	3510C	286747
240-81845-7	HB17-07	SPLP East	Solid	3510C	286747
240-81845-8	HB17-08	SPLP East	Solid	3510C	286747
MB 240-286813/10-A	Method Blank	Total/NA	Solid	3510C	
LCS 240-286813/11-A	Lab Control Sample	Total/NA	Solid	3510C	
240-81845-2 MS	HB17-02	SPLP East	Solid	3510C	286747

Analysis Batch: 287454

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81845-1	HB17-01	SPLP East	Solid	8270C	286813
240-81845-2	HB17-02	SPLP East	Solid	8270C	286813
240-81845-3	HB17-03	SPLP East	Solid	8270C	286813
240-81845-4	HB17-04	SPLP East	Solid	8270C	286813
240-81845-5	HB17-05	SPLP East	Solid	8270C	286813
240-81845-6	HB17-06	SPLP East	Solid	8270C	286813
240-81845-7	HB17-07	SPLP East	Solid	8270C	286813
240-81845-8	HB17-08	SPLP East	Solid	8270C	286813
MB 240-286813/10-A	Method Blank	Total/NA	Solid	8270C	286813
LCS 240-286813/11-A	Lab Control Sample	Total/NA	Solid	8270C	286813
240-81845-2 MS	HB17-02	SPLP East	Solid	8270C	286813

GC Semi VOA

Leach Batch: 118369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81845-1	HB17-01	SPLP East	Solid	1312	
240-81845-2	HB17-02	SPLP East	Solid	1312	
240-81845-3	HB17-03	SPLP East	Solid	1312	
240-81845-4	HB17-04	SPLP East	Solid	1312	
240-81845-5	HB17-05	SPLP East	Solid	1312	
240-81845-6	HB17-06	SPLP East	Solid	1312	
240-81845-7	HB17-07	SPLP East	Solid	1312	
240-81845-8	HB17-08	SPLP East	Solid	1312	

TestAmerica Canton

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

GC Semi VOA (Continued)

Leach Batch: 118369 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 200-118369/1-B	Method Blank	SPLP East	Solid	1312	
LCS 200-118369/2-B	Lab Control Sample	SPLP East	Solid	1312	
LCSD 200-118369/3-B	Lab Control Sample Dup	SPLP East	Solid	1312	

Prep Batch: 118488

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81845-1	HB17-01	SPLP East	Solid	3510C	118369
240-81845-2	HB17-02	SPLP East	Solid	3510C	118369
240-81845-3	HB17-03	SPLP East	Solid	3510C	118369
240-81845-4	HB17-04	SPLP East	Solid	3510C	118369
240-81845-5	HB17-05	SPLP East	Solid	3510C	118369
240-81845-6	HB17-06	SPLP East	Solid	3510C	118369
240-81845-7	HB17-07	SPLP East	Solid	3510C	118369
240-81845-8	HB17-08	SPLP East	Solid	3510C	118369
MB 200-118369/1-B	Method Blank	SPLP East	Solid	3510C	118369
LCS 200-118369/2-B	Lab Control Sample	SPLP East	Solid	3510C	118369
LCSD 200-118369/3-B	Lab Control Sample Dup	SPLP East	Solid	3510C	118369

Analysis Batch: 118670

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81845-1	HB17-01	SPLP East	Solid	Organotins/GC	118488
240-81845-2	HB17-02	SPLP East	Solid	Organotins/GC	118488
240-81845-3	HB17-03	SPLP East	Solid	Organotins/GC	118488
240-81845-4	HB17-04	SPLP East	Solid	Organotins/GC	118488
240-81845-5	HB17-05	SPLP East	Solid	Organotins/GC	118488
240-81845-6	HB17-06	SPLP East	Solid	Organotins/GC	118488
240-81845-7	HB17-07	SPLP East	Solid	Organotins/GC	118488
240-81845-8	HB17-08	SPLP East	Solid	Organotins/GC	118488
MB 200-118369/1-B	Method Blank	SPLP East	Solid	Organotins/GC	118488
LCS 200-118369/2-B	Lab Control Sample	SPLP East	Solid	Organotins/GC	118488
LCSD 200-118369/3-B	Lab Control Sample Dup	SPLP East	Solid	Organotins/GC	118488

Metals

Leach Batch: 286747

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81845-1	HB17-01	SPLP East	Solid	1312	
240-81845-2	HB17-02	SPLP East	Solid	1312	
240-81845-3	HB17-03	SPLP East	Solid	1312	
240-81845-4	HB17-04	SPLP East	Solid	1312	
240-81845-5	HB17-05	SPLP East	Solid	1312	
240-81845-6	HB17-06	SPLP East	Solid	1312	
240-81845-7	HB17-07	SPLP East	Solid	1312	
240-81845-8	HB17-08	SPLP East	Solid	1312	
LB 240-286747/1-B	Method Blank	SPLP East	Solid	1312	
LB 240-286747/1-C	Method Blank	SPLP East	Solid	1312	
240-81845-7 MS	HB17-07	SPLP East	Solid	1312	
240-81845-7 MSD	HB17-07	SPLP East	Solid	1312	

TestAmerica Canton

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Metals (Continued)

Prep Batch: 286852

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81845-1	HB17-01	SPLP East	Solid	3010A	286747
240-81845-2	HB17-02	SPLP East	Solid	3010A	286747
240-81845-3	HB17-03	SPLP East	Solid	3010A	286747
240-81845-4	HB17-04	SPLP East	Solid	3010A	286747
240-81845-5	HB17-05	SPLP East	Solid	3010A	286747
240-81845-6	HB17-06	SPLP East	Solid	3010A	286747
240-81845-7	HB17-07	SPLP East	Solid	3010A	286747
240-81845-8	HB17-08	SPLP East	Solid	3010A	286747
LB 240-286747/1-B	Method Blank	SPLP East	Solid	3010A	286747
MB 240-286852/2-A	Method Blank	Total/NA	Solid	3010A	
LCS 240-286852/3-A	Lab Control Sample	Total/NA	Solid	3010A	
240-81845-7 MS	HB17-07	SPLP East	Solid	3010A	286747
240-81845-7 MSD	HB17-07	SPLP East	Solid	3010A	286747

Prep Batch: 286858

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81845-1	HB17-01	SPLP East	Solid	7470A	286747
240-81845-2	HB17-02	SPLP East	Solid	7470A	286747
240-81845-3	HB17-03	SPLP East	Solid	7470A	286747
240-81845-4	HB17-04	SPLP East	Solid	7470A	286747
240-81845-5	HB17-05	SPLP East	Solid	7470A	286747
240-81845-6	HB17-06	SPLP East	Solid	7470A	286747
240-81845-7	HB17-07	SPLP East	Solid	7470A	286747
240-81845-8	HB17-08	SPLP East	Solid	7470A	286747
LB 240-286747/1-C	Method Blank	SPLP East	Solid	7470A	286747
MB 240-286858/2-A	Method Blank	Total/NA	Solid	7470A	
LCS 240-286858/3-A	Lab Control Sample	Total/NA	Solid	7470A	
240-81845-7 MS	HB17-07	SPLP East	Solid	7470A	286747
240-81845-7 MSD	HB17-07	SPLP East	Solid	7470A	286747

Analysis Batch: 287165

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81845-1	HB17-01	SPLP East	Solid	7470A	286858
240-81845-2	HB17-02	SPLP East	Solid	7470A	286858
240-81845-3	HB17-03	SPLP East	Solid	7470A	286858
240-81845-4	HB17-04	SPLP East	Solid	7470A	286858
240-81845-5	HB17-05	SPLP East	Solid	7470A	286858
240-81845-6	HB17-06	SPLP East	Solid	7470A	286858
240-81845-7	HB17-07	SPLP East	Solid	7470A	286858
240-81845-8	HB17-08	SPLP East	Solid	7470A	286858
LB 240-286747/1-C	Method Blank	SPLP East	Solid	7470A	286858
MB 240-286858/2-A	Method Blank	Total/NA	Solid	7470A	286858
LCS 240-286858/3-A	Lab Control Sample	Total/NA	Solid	7470A	286858
240-81845-7 MS	HB17-07	SPLP East	Solid	7470A	286858
240-81845-7 MSD	HB17-07	SPLP East	Solid	7470A	286858

Analysis Batch: 287191

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81845-1	HB17-01	SPLP East	Solid	6010B	286852
240-81845-2	HB17-02	SPLP East	Solid	6010B	286852
240-81845-3	HB17-03	SPLP East	Solid	6010B	286852

TestAmerica Canton

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Metals (Continued)

Analysis Batch: 287191 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-81845-4	HB17-04	SPLP East	Solid	6010B	286852
240-81845-5	HB17-05	SPLP East	Solid	6010B	286852
240-81845-6	HB17-06	SPLP East	Solid	6010B	286852
240-81845-7	HB17-07	SPLP East	Solid	6010B	286852
240-81845-8	HB17-08	SPLP East	Solid	6010B	286852
LB 240-286747/1-B	Method Blank	SPLP East	Solid	6010B	286852
MB 240-286852/2-A	Method Blank	Total/NA	Solid	6010B	286852
LCS 240-286852/3-A	Lab Control Sample	Total/NA	Solid	6010B	286852
240-81845-7 MS	HB17-07	SPLP East	Solid	6010B	286852
240-81845-7 MSD	HB17-07	SPLP East	Solid	6010B	286852

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-01

Date Collected: 06/30/17 16:00

Date Received: 07/01/17 09:30

Lab Sample ID: 240-81845-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3510C			286813	07/12/17 08:06	BMB	TAL CAN
SPLP East	Analysis	8270C		1	287454	07/17/17 15:04	JMG	TAL CAN
SPLP East	Leach	1312			118369	07/10/17 17:00	JM1	TAL BUR
SPLP East	Prep	3510C			118488	07/13/17 10:55	JM1	TAL BUR
SPLP East	Analysis	Organotins/GC		1	118670	07/18/17 17:08	RRM	TAL BUR
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3010A			286852	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	6010B		1	287191	07/13/17 19:17	RKT	TAL CAN
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	7470A			286858	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	7470A		1	287165	07/13/17 11:08	DTN	TAL CAN

Client Sample ID: HB17-02

Date Collected: 06/30/17 16:00

Date Received: 07/01/17 09:30

Lab Sample ID: 240-81845-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3510C			286813	07/12/17 08:06	BMB	TAL CAN
SPLP East	Analysis	8270C		1	287454	07/17/17 14:16	JMG	TAL CAN
SPLP East	Leach	1312			118369	07/10/17 17:00	JM1	TAL BUR
SPLP East	Prep	3510C			118488	07/13/17 10:55	JM1	TAL BUR
SPLP East	Analysis	Organotins/GC		1	118670	07/18/17 17:25	RRM	TAL BUR
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3010A			286852	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	6010B		1	287191	07/13/17 19:21	RKT	TAL CAN
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	7470A			286858	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	7470A		1	287165	07/13/17 11:10	DTN	TAL CAN

Client Sample ID: HB17-03

Date Collected: 06/30/17 16:00

Date Received: 07/01/17 09:30

Lab Sample ID: 240-81845-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3510C			286813	07/12/17 08:06	BMB	TAL CAN
SPLP East	Analysis	8270C		1	287454	07/17/17 17:26	JMG	TAL CAN
SPLP East	Leach	1312			118369	07/10/17 17:00	JM1	TAL BUR
SPLP East	Prep	3510C			118488	07/13/17 10:55	JM1	TAL BUR
SPLP East	Analysis	Organotins/GC		1	118670	07/18/17 17:42	RRM	TAL BUR
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3010A			286852	07/12/17 14:00	WKD	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-03

Lab Sample ID: 240-81845-3

Date Collected: 06/30/17 16:00

Matrix: Solid

Date Received: 07/01/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Analysis	6010B		1	287191	07/13/17 19:26	RKT	TAL CAN
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	7470A			286858	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	7470A		1	287165	07/13/17 11:12	DTN	TAL CAN

Client Sample ID: HB17-04

Lab Sample ID: 240-81845-4

Date Collected: 06/30/17 16:00

Matrix: Solid

Date Received: 07/01/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3510C			286813	07/12/17 08:06	BMB	TAL CAN
SPLP East	Analysis	8270C		1	287454	07/17/17 17:02	JMG	TAL CAN
SPLP East	Leach	1312			118369	07/10/17 17:00	JM1	TAL BUR
SPLP East	Prep	3510C			118488	07/13/17 10:55	JM1	TAL BUR
SPLP East	Analysis	Organotins/GC		1	118670	07/18/17 17:59	RRM	TAL BUR
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3010A			286852	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	6010B		1	287191	07/13/17 19:38	RKT	TAL CAN
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	7470A			286858	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	7470A		1	287165	07/13/17 11:14	DTN	TAL CAN

Client Sample ID: HB17-05

Lab Sample ID: 240-81845-5

Date Collected: 06/30/17 16:00

Matrix: Solid

Date Received: 07/01/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3510C			286813	07/12/17 08:06	BMB	TAL CAN
SPLP East	Analysis	8270C		1	287454	07/17/17 16:39	JMG	TAL CAN
SPLP East	Leach	1312			118369	07/10/17 17:00	JM1	TAL BUR
SPLP East	Prep	3510C			118488	07/13/17 10:55	JM1	TAL BUR
SPLP East	Analysis	Organotins/GC		1	118670	07/18/17 18:15	RRM	TAL BUR
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3010A			286852	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	6010B		1	287191	07/13/17 19:43	RKT	TAL CAN
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	7470A			286858	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	7470A		1	287165	07/13/17 11:16	DTN	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Client Sample ID: HB17-06

Lab Sample ID: 240-81845-6

Date Collected: 06/30/17 16:00

Matrix: Solid

Date Received: 07/01/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3510C			286813	07/12/17 08:06	BMB	TAL CAN
SPLP East	Analysis	8270C		1	287454	07/17/17 16:15	JMG	TAL CAN
SPLP East	Leach	1312			118369	07/10/17 17:00	JM1	TAL BUR
SPLP East	Prep	3510C			118488	07/13/17 10:55	JM1	TAL BUR
SPLP East	Analysis	Organotins/GC		1	118670	07/18/17 18:32	RRM	TAL BUR
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3010A			286852	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	6010B		1	287191	07/13/17 19:47	RKT	TAL CAN
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	7470A			286858	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	7470A		1	287165	07/13/17 11:18	DTN	TAL CAN

Client Sample ID: HB17-07

Lab Sample ID: 240-81845-7

Date Collected: 06/30/17 16:00

Matrix: Solid

Date Received: 07/01/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3510C			286813	07/12/17 08:06	BMB	TAL CAN
SPLP East	Analysis	8270C		1	287454	07/17/17 15:51	JMG	TAL CAN
SPLP East	Leach	1312			118369	07/10/17 17:00	JM1	TAL BUR
SPLP East	Prep	3510C			118488	07/13/17 10:55	JM1	TAL BUR
SPLP East	Analysis	Organotins/GC		1	118670	07/18/17 18:49	RRM	TAL BUR
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3010A			286852	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	6010B		1	287191	07/13/17 18:56	RKT	TAL CAN
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	7470A			286858	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	7470A		1	287165	07/13/17 10:56	DTN	TAL CAN

Client Sample ID: HB17-08

Lab Sample ID: 240-81845-8

Date Collected: 06/30/17 16:00

Matrix: Solid

Date Received: 07/01/17 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3510C			286813	07/12/17 08:06	BMB	TAL CAN
SPLP East	Analysis	8270C		1	287454	07/17/17 15:27	JMG	TAL CAN
SPLP East	Leach	1312			118369	07/10/17 17:00	JM1	TAL BUR
SPLP East	Prep	3510C			118488	07/13/17 10:55	JM1	TAL BUR
SPLP East	Analysis	Organotins/GC		1	118670	07/18/17 19:06	RRM	TAL BUR
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	3010A			286852	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	6010B		1	287191	07/13/17 19:51	RKT	TAL CAN

TestAmerica Canton

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			286747	07/11/17 15:45	MH	TAL CAN
SPLP East	Prep	7470A			286858	07/12/17 14:00	WKD	TAL CAN
SPLP East	Analysis	7470A		1	287165	07/13/17 11:20	DTN	TAL CAN

Laboratory References:

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

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Accreditation/Certification Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-81845-1

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-18
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-18
Illinois	NELAP	5	200004	07-31-17 *
Kansas	NELAP	7	E-10336	01-31-18
Kentucky (UST)	State Program	4	58	02-23-18
Kentucky (WW)	State Program	4	98016	12-31-17
Minnesota	NELAP	5	039-999-348	12-31-17
Minnesota (Petrofund)	State Program	1	3506	07-31-17 *
Nevada	State Program	9	OH-000482008A	07-31-17 *
New Jersey	NELAP	2	OH001	06-30-18
New York	NELAP	2	10975	03-31-18
Ohio VAP	State Program	5	CL0024	09-14-17 *
Oregon	NELAP	10	4062	02-23-18
Pennsylvania	NELAP	3	68-00340	08-31-17 *
Texas	NELAP	6	T104704517-15-5	08-31-17 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-17 *
Washington	State Program	10	C971	01-12-18
West Virginia DEP	State Program	3	210	12-31-17
Wisconsin	State Program	5	999518190	08-31-17 *

Laboratory: TestAmerica Burlington

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Connecticut	State Program	1	PH-0751	09-30-17
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	NA	02-02-18
Florida	NELAP	4	E87467	06-30-18
L-A-B	DoD ELAP		L2336	02-25-20
Maine	State Program	1	VT00008	04-17-19
Minnesota	NELAP	5	050-999-436	12-31-17
New Hampshire	NELAP	1	2006	12-18-17
New Jersey	NELAP	2	VT972	06-30-18
New York	NELAP	2	10391	04-01-18
Pennsylvania	NELAP	3	68-00489	04-30-18
Rhode Island	State Program	1	LAO00298	12-30-17
US Fish & Wildlife	Federal		LE-058448-0	10-31-17
USDA	Federal		P330-11-00093	12-05-19
Vermont	State Program	1	VT-4000	12-31-17
Virginia	NELAP	3	460209	12-14-17

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Canton



ID#:

0.9/0.9

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Lab Work Order #

Page 1 of 1

Contact & Company Name: DAVE LILES, Arcadis Address: City: State: Zip: Telephone: 919 328 5574 Fax: E-mail Address: david.liles@arcadis.com		Send Results to: Project Name/Location (City, State): Howards Bay Treat Study Sample's Printed Name: DAVE LILES Project #: 16935001.000.0001 Sample's Signature: David S. Giles		Preservative Filtered (✓) # of Containers: 1 Container Information: 8		PARAMETER ANALYSIS & METHOD PAHs (SPLP) 8270 Metals (SPLP) 6010 Tri-butyl/tin (SPLP)		Keys Preservation Key: A. H ₂ SO ₄ B. HCL C. HNO ₃ D. NaOH E. None F. Other: G. Other: H. Other: Matrix Key: SE - Sediment SO - Soil W - Water T - Tissue NL - NAPL/Oil SW - Sample Wipe A - Air Other:		
Sample ID	Collection Date	Time	Type (✓)	Comp	Grab	Matrix	REMARKS			
HB17-01	6/30/17	16:00	X		X	SE	240-81845 Chain of Custody			
HB17-02			X		X					
HB17-03			X		X					
HB17-04			X		X					
HB17-05			X		X					
HB17-06			X		X					
HB17-07			X		X					
HB17-08			X		X					
Special Instructions/Comments: <input type="checkbox"/> Special QA/QC Instructions (✓): metals list is RCRA metals + thallium										
Laboratory Information and Receipt Lab Name: DAVE LILES <input type="checkbox"/> Cooler packed with ice (✓) <input type="checkbox"/> Intact <input type="checkbox"/> Not Intact Sample Receipt: Condition/Cooler Temp:			Relinquished By Printed Name: Dave Liles Signature: [Signature] Firm: ARCADIS Date/Time: 6/30/17 16:00			Received By Printed Name: [Name] Signature: [Signature] Firm/Courier: [Firm] Date/Time: 07/01/17			Relinquished By Printed Name: Signature: Firm: Date/Time:	
Shipping Tracking #			Distribution:			WHITE - Laboratory returns with results			YELLOW - Lab copy	



TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 81845

Client Accadis Site Name Howards Bay Cooler unpacked by: DSJ
 Cooler Received on 07/01/17 Opened on 07/01/17
 FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____
 Packing material used: Bubble ~~Wrap~~ Foam Plastic Bag None Other _____
 COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF -0.4 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN #36 (CF +0 °C) Observed Cooler Temp. 0.4 °C Corrected Cooler Temp. 0.4 °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
 -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
 4. Did custody papers accompany the sample(s)? Yes No
 5. Were the custody papers relinquished & signed in the appropriate place? Yes No
 6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
 7. Did all bottles arrive in good condition (Unbroken)? Yes No
 8. Could all bottle labels be reconciled with the COC? Yes No
 9. Were correct bottle(s) used for the test(s) indicated? Yes No
 10. Sufficient quantity received to perform indicated analyses? Yes No
 11. Are these work share samples? Yes No
 If yes, Questions 11-15 have been checked at the originating laboratory.
11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC697954
 12. Were VOAs on the COC? Yes No NA
 13. Were air bubbles >6 mm in any VOA vials? Yes No NA  ← Larger than this.
 14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No NA
 15. Was a LL Hg or Me Hg trip blank present? Yes No NA
- Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

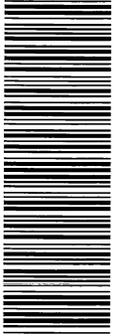
16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by: _____

17. SAMPLE CONDITION
 Sample(s) _____ were received after the recommended holding time had expired.
 Sample(s) _____ were received in a broken container.
 Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

18. SAMPLE PRESERVATION
 Sample(s) _____ were further preserved in the laboratory.
 Time preserved: _____ Preservative(s) added/Lot number(s): _____

Ref: SOP NC-SC-0005, Sample Receiving
 (\\ncorp\corp\QA\QA_Facilities\Canton-QA\Document-Management\Work-Instruction\Work_Revision\Work_Instructions\WI-NC-099-052317 Cooler Receipt Form.doc djl)

Chain of Custody Record



Client Information (Sub Contract Lab)		Lab PM: Howell, Leslie	COC No: 240-73261.1
Client Contact: Shipping/Receiving		Phone: E-Mail: leslie.howell@testamericainc.com	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		State of Origin: Wisconsin	Job #: 240-81845-1
Address: 30 Community Drive, Suite 11,		Preservation Codes:	
City: South Burlington		A - HCL	
State, Zip: VT, 05403		M - Hexane	
Phone: 802-660-1990(Tel) 802-660-1919(Fax)		N - None	
Email:		O - AsNaO2	
Project #: 24018568		P - Na2OAS	
Site: Howard's Bay		Q - Na2SO3	
		R - Na2SO4	
		S - H2SO4	
		T - TSP Dodecahydrate	
		U - Acetone	
		V - MCAA	
		W - pH 4-5	
		L - EDA	
		Z - other (specify)	
		Other:	
		Total Number of Containers	
		Special Instructions/Note:	
		Organolins_GC/1312.m	
		Field Filtered Sample (Yes or No)	
		Analysis Requested	
		Matrix (W=water, S=solid, O=wastewater)	
		Sample Type (C=comp, G=grab)	
		Sample Time	
		Sample Date	
		Preservation Code	
		HB17-01 (240-81845-1)	
		HB17-02 (240-81845-2)	
		HB17-03 (240-81845-3)	
		HB17-04 (240-81845-4)	
		HB17-05 (240-81845-5)	
		HB17-06 (240-81845-6)	
		HB17-07 (240-81845-7)	
		HB17-08 (240-81845-8)	
<p>Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.</p>			
Possible Hazard Identification			
Unconfirmed			
Deliverable Requested: I, II, III, IV, Other (specify)			
Primary Deliverable Rank: 2			
Empty Kit Relinquished by:			
Date:			
Relinquished by: <i>R. Abic</i>			
Date/Time: 7/17/17 16:30			
Relinquished by:			
Date/Time:			
Relinquished by:			
Date/Time:			
Custody Seals Intact: Custody Seal No.:			
<input type="checkbox"/> Yes <input type="checkbox"/> No			
Cooler Temperature(s) °C and Other Remarks: S.O			
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)			
<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Special Instructions/QC Requirements:			
Method of Shipment:			
Date/Time: 7/18/17 09:45			
Date/Time:			
Date/Time:			
Company: TA Bud			
Company:			
Company:			



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Part # 150470-434 RIT2 EXP 04/18

ORIGIN ID:PHDA (330) 966-9677
AL HAIDET
TESTAMERICA
4101 SHUFFEL DR

SHIP DATE: 07JUL17
ACTWGT: 23.20 LB
CAD: 507102/CAFE3011

NORTH CANTON, OH 44720
UNITED STATES US

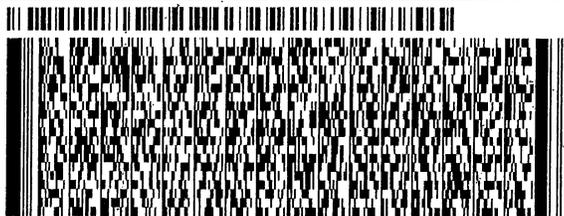
BILL RECIPIENT

TO ENVIRONMENTAL SAMPLE RECEIPT
TESTAMERICA BURLINGTON
30 COMMUNITY DRIVE

SOUTH BURLINGTON VT 05403

(802) 660-1990
DEPT: AL HAIDET

REF: S240-44087



FedEx
Express



TRK# 7420 8478 9550
0201

SATURDAY 12:00P
PRIORITY OVERNIGHT

XO BTVA

05403
VT-US BTV



Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 240-81845-1

Login Number: 81845
List Number: 2
Creator: Johnson, Eleanor E

List Source: TestAmerica Burlington
List Creation: 07/08/17 10:05 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.0°C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	No analysis requiring residual chlorine check assigned.

STEP 4 - GENERAL



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

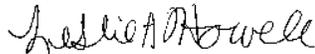
ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-85314-1
Client Project/Site: Howard's Bay
Revision: 2

For:
ARCADIS U.S. Inc
4915 Prospectus Drive
Suite G
Durham, North Carolina 27713

Attn: Andy Baumeister



Authorized for release by:
1/11/2018 3:44:31 PM

Leslie Howell, Project Manager I
(330)497-9396
leslie.howell@testamericainc.com

LINKS

Review your project
results through
Total Access

Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Job ID: 240-85314-1

Laboratory: TestAmerica Canton

Narrative

Job Narrative
240-85314-1
REVISED

Comments

Revised Report 10-11-17: Report has been revised to include 1-methylnaphthalene and adjust the units for Chloride.

All analysis were performed at TestAmerica Pittsburgh Laboratory.

Receipt

The samples were received on 9/19/2017 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.4° C.

GC/MS Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Geotechnical

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

Method(s) 3520C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with 224319.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Method	Method Description	Protocol	Laboratory
8270C	Semivolatile Organic Compounds (GC/MS)	SW846	TAL PIT
9056A	Anions, Ion Chromatography	SW846	TAL PIT
6010B	Metals (ICP)	SW846	TAL PIT
7470A	Mercury (CVAA)	SW846	TAL PIT
9045D	pH	SW846	TAL PIT
SM 2320B	Alkalinity	SM	TAL PIT

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Sample Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-85314-1	STEP 4 MIX-1	Solid	09/18/17 15:30	09/19/17 09:15
240-85314-2	STEP 4 MIX-2	Solid	09/18/17 15:30	09/19/17 09:15

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Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Client Sample ID: STEP 4 MIX-1

Lab Sample ID: 240-85314-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	1.1		1.0	0.71	mg/L	1		9056A	SPLP East
Arsenic	0.0041	J	0.010	0.0041	mg/L	1		6010B	SPLP East
Barium	0.17	J B	0.20	0.0011	mg/L	1		6010B	SPLP East
Chromium	0.0041	J	0.0050	0.00078	mg/L	1		6010B	SPLP East
Calcium	220		5.0	0.088	mg/L	1		6010B	SPLP East
Calcium hardness as CaCO3	540		13	0.22	mg/L	1		6010B	SPLP East
pH	12.3	HF	0.1	0.1	SU	1		9045D	Total/NA
Alkalinity	720		5.0	5.0	mg/L	1		SM 2320B	ASTM Leach

Client Sample ID: STEP 4 MIX-2

Lab Sample ID: 240-85314-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	0.90	J	1.0	0.71	mg/L	1		9056A	SPLP East
Arsenic	0.0050	J	0.010	0.0041	mg/L	1		6010B	SPLP East
Barium	0.077	J B	0.20	0.0011	mg/L	1		6010B	SPLP East
Chromium	0.0066		0.0050	0.00078	mg/L	1		6010B	SPLP East
Calcium	120		5.0	0.088	mg/L	1		6010B	SPLP East
Calcium hardness as CaCO3	300		13	0.22	mg/L	1		6010B	SPLP East
pH	12.2	HF	0.1	0.1	SU	1		9045D	Total/NA
Alkalinity	290		5.0	5.0	mg/L	1		SM 2320B	ASTM Leach

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Client Sample ID: STEP 4 MIX-1

Lab Sample ID: 240-85314-1

Date Collected: 09/18/17 15:30

Matrix: Solid

Date Received: 09/19/17 09:15

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<0.0018		0.0018	0.00069	mg/L		09/28/17 11:47	09/29/17 19:20	1
Acenaphthylene	<0.0018		0.0018	0.00057	mg/L		09/28/17 11:47	09/29/17 19:20	1
Anthracene	<0.0018		0.0018	0.00053	mg/L		09/28/17 11:47	09/29/17 19:20	1
Benzo[a]anthracene	<0.0018		0.0018	0.0011	mg/L		09/28/17 11:47	09/29/17 19:20	1
Benzo[b]fluoranthene	<0.0018		0.0018	0.00063	mg/L		09/28/17 11:47	09/29/17 19:20	1
Benzo[k]fluoranthene	<0.0018		0.0018	0.0018	mg/L		09/28/17 11:47	09/29/17 19:20	1
Benzo[g,h,i]perylene	<0.0018		0.0018	0.00078	mg/L		09/28/17 11:47	09/29/17 19:20	1
Benzo[a]pyrene	<0.0018		0.0018	0.00085	mg/L		09/28/17 11:47	09/29/17 19:20	1
Chrysene	<0.0018		0.0018	0.00080	mg/L		09/28/17 11:47	09/29/17 19:20	1
Dibenz(a,h)anthracene	<0.0018		0.0018	0.00074	mg/L		09/28/17 11:47	09/29/17 19:20	1
Fluoranthene	<0.0018		0.0018	0.0011	mg/L		09/28/17 11:47	09/29/17 19:20	1
Fluorene	<0.0018		0.0018	0.0011	mg/L		09/28/17 11:47	09/29/17 19:20	1
Indeno[1,2,3-cd]pyrene	<0.0018		0.0018	0.00073	mg/L		09/28/17 11:47	09/29/17 19:20	1
Naphthalene	<0.0018		0.0018	0.0017	mg/L		09/28/17 11:47	09/29/17 19:20	1
Phenanthrene	<0.0018		0.0018	0.0012	mg/L		09/28/17 11:47	09/29/17 19:20	1
Pyrene	<0.0018		0.0018	0.00087	mg/L		09/28/17 11:47	09/29/17 19:20	1
1-Methylnaphthalene	<0.0018		0.0018	0.00083	mg/L		09/28/17 11:47	09/29/17 19:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorophenol (Surr)	64		28 - 100				09/28/17 11:47	09/29/17 19:20	1
2,4,6-Tribromophenol (Surr)	102		33 - 103				09/28/17 11:47	09/29/17 19:20	1
Nitrobenzene-d5 (Surr)	76		36 - 100				09/28/17 11:47	09/29/17 19:20	1
Phenol-d5 (Surr)	64		33 - 100				09/28/17 11:47	09/29/17 19:20	1
Terphenyl-d14 (Surr)	48		20 - 106				09/28/17 11:47	09/29/17 19:20	1

Method: 9056A - Anions, Ion Chromatography - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.1		1.0	0.71	mg/L			09/29/17 09:52	1

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	<0.0050		0.0050	0.00085	mg/L		09/28/17 09:02	09/29/17 10:14	1
Arsenic	0.0041	J	0.010	0.0041	mg/L		09/28/17 09:02	09/29/17 10:14	1
Barium	0.17	J B	0.20	0.0011	mg/L		09/28/17 09:02	09/29/17 10:14	1
Cadmium	<0.0050		0.0050	0.00016	mg/L		09/28/17 09:02	09/29/17 10:14	1
Chromium	0.0041	J	0.0050	0.00078	mg/L		09/28/17 09:02	09/29/17 10:14	1
Lead	<0.010		0.010	0.0029	mg/L		09/28/17 09:02	09/29/17 10:14	1
Selenium	<0.010		0.010	0.0036	mg/L		09/28/17 09:02	09/29/17 10:14	1
Thallium	<0.020		0.020	0.0029	mg/L		09/28/17 09:02	09/29/17 10:14	1
Calcium	220		5.0	0.088	mg/L		09/28/17 09:02	09/29/17 10:14	1
Magnesium	<5.0		5.0	0.045	mg/L		09/28/17 09:02	09/29/17 10:14	1
Calcium hardness as CaCO3	540		13	0.22	mg/L		09/28/17 09:02	09/29/17 10:14	1

Method: 7470A - Mercury (CVAA) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000065	mg/L		09/27/17 13:50	09/28/17 09:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	12.3	HF	0.1	0.1	SU			09/25/17 15:07	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Client Sample ID: STEP 4 MIX-1

Lab Sample ID: 240-85314-1

Date Collected: 09/18/17 15:30

Matrix: Solid

Date Received: 09/19/17 09:15

General Chemistry - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	720		5.0	5.0	mg/L			09/28/17 14:00	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Client Sample ID: STEP 4 MIX-2

Lab Sample ID: 240-85314-2

Date Collected: 09/18/17 15:30

Matrix: Solid

Date Received: 09/19/17 09:15

Method: 8270C - Semivolatile Organic Compounds (GC/MS) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<0.0018		0.0018	0.00069	mg/L		09/28/17 11:48	09/29/17 19:47	1
Acenaphthylene	<0.0018		0.0018	0.00057	mg/L		09/28/17 11:48	09/29/17 19:47	1
Anthracene	<0.0018		0.0018	0.00053	mg/L		09/28/17 11:48	09/29/17 19:47	1
Benzo[a]anthracene	<0.0018		0.0018	0.0011	mg/L		09/28/17 11:48	09/29/17 19:47	1
Benzo[b]fluoranthene	<0.0018		0.0018	0.00063	mg/L		09/28/17 11:48	09/29/17 19:47	1
Benzo[k]fluoranthene	<0.0018		0.0018	0.0018	mg/L		09/28/17 11:48	09/29/17 19:47	1
Benzo[g,h,i]perylene	<0.0018		0.0018	0.00078	mg/L		09/28/17 11:48	09/29/17 19:47	1
Benzo[a]pyrene	<0.0018		0.0018	0.00085	mg/L		09/28/17 11:48	09/29/17 19:47	1
Chrysene	<0.0018		0.0018	0.00080	mg/L		09/28/17 11:48	09/29/17 19:47	1
Dibenz(a,h)anthracene	<0.0018		0.0018	0.00074	mg/L		09/28/17 11:48	09/29/17 19:47	1
Fluoranthene	<0.0018		0.0018	0.0011	mg/L		09/28/17 11:48	09/29/17 19:47	1
Fluorene	<0.0018		0.0018	0.0011	mg/L		09/28/17 11:48	09/29/17 19:47	1
Indeno[1,2,3-cd]pyrene	<0.0018		0.0018	0.00073	mg/L		09/28/17 11:48	09/29/17 19:47	1
Naphthalene	<0.0018		0.0018	0.0017	mg/L		09/28/17 11:48	09/29/17 19:47	1
Phenanthrene	<0.0018		0.0018	0.0012	mg/L		09/28/17 11:48	09/29/17 19:47	1
Pyrene	<0.0018		0.0018	0.00087	mg/L		09/28/17 11:48	09/29/17 19:47	1
1-Methylnaphthalene	<0.0018		0.0018	0.00083	mg/L		09/28/17 11:48	09/29/17 19:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Fluorophenol (Surr)	61		28 - 100				09/28/17 11:48	09/29/17 19:47	1
2,4,6-Tribromophenol (Surr)	96		33 - 103				09/28/17 11:48	09/29/17 19:47	1
Nitrobenzene-d5 (Surr)	73		36 - 100				09/28/17 11:48	09/29/17 19:47	1
Phenol-d5 (Surr)	60		33 - 100				09/28/17 11:48	09/29/17 19:47	1
Terphenyl-d14 (Surr)	43		20 - 106				09/28/17 11:48	09/29/17 19:47	1

Method: 9056A - Anions, Ion Chromatography - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.90	J	1.0	0.71	mg/L			09/29/17 08:48	1

Method: 6010B - Metals (ICP) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	<0.0050		0.0050	0.00085	mg/L		09/28/17 09:02	09/29/17 10:20	1
Arsenic	0.0050	J	0.010	0.0041	mg/L		09/28/17 09:02	09/29/17 10:20	1
Barium	0.077	J B	0.20	0.0011	mg/L		09/28/17 09:02	09/29/17 10:20	1
Cadmium	<0.0050		0.0050	0.00016	mg/L		09/28/17 09:02	09/29/17 10:20	1
Chromium	0.0066		0.0050	0.00078	mg/L		09/28/17 09:02	09/29/17 10:20	1
Lead	<0.010		0.010	0.0029	mg/L		09/28/17 09:02	09/29/17 10:20	1
Selenium	<0.010		0.010	0.0036	mg/L		09/28/17 09:02	09/29/17 10:20	1
Thallium	<0.020		0.020	0.0029	mg/L		09/28/17 09:02	09/29/17 10:20	1
Calcium	120		5.0	0.088	mg/L		09/28/17 09:02	09/29/17 10:20	1
Magnesium	<5.0		5.0	0.045	mg/L		09/28/17 09:02	09/29/17 10:20	1
Calcium hardness as CaCO3	300		13	0.22	mg/L		09/28/17 09:02	09/29/17 10:20	1

Method: 7470A - Mercury (CVAA) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000065	mg/L		09/27/17 13:50	09/28/17 09:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	12.2	HF	0.1	0.1	SU			09/25/17 15:08	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Client Sample ID: STEP 4 MIX-2

Lab Sample ID: 240-85314-2

Date Collected: 09/18/17 15:30

Matrix: Solid

Date Received: 09/19/17 09:15

General Chemistry - ASTM Leach

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	290		5.0	5.0	mg/L			09/28/17 14:00	1

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

Surrogate Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	2FP (28-100)	TBP (33-103)	NBZ (36-100)	PHL (33-100)	TPHL (20-106)
LCS 180-224319/2-A	Lab Control Sample	67	90	72	66	69
LCSD 180-224319/3-A	Lab Control Sample Dup	68	92	71	69	72
MB 180-224319/1-A	Method Blank	71	90	78	71	77

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: SPLP East

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	2FP (28-100)	TBP (33-103)	NBZ (36-100)	PHL (33-100)	TPHL (20-106)
240-85314-1	STEP 4 MIX-1	64	102	76	64	48
240-85314-2	STEP 4 MIX-2	61	96	73	60	43
LB 180-224042/1-D	Method Blank	65	86	70	67	83

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPHL = Terphenyl-d14 (Surr)

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 180-224319/1-A

Matrix: Solid

Analysis Batch: 224448

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 224319

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	<0.0019		0.0019	0.00072	mg/L		09/28/17 11:47	09/29/17 12:05	1
Acenaphthylene	<0.0019		0.0019	0.00060	mg/L		09/28/17 11:47	09/29/17 12:05	1
Anthracene	<0.0019		0.0019	0.00056	mg/L		09/28/17 11:47	09/29/17 12:05	1
Benzo[a]anthracene	<0.0019		0.0019	0.0012	mg/L		09/28/17 11:47	09/29/17 12:05	1
Benzo[b]fluoranthene	<0.0019		0.0019	0.00066	mg/L		09/28/17 11:47	09/29/17 12:05	1
Benzo[k]fluoranthene	<0.0019		0.0019	0.0018	mg/L		09/28/17 11:47	09/29/17 12:05	1
Benzo[g,h,i]perylene	<0.0019		0.0019	0.00082	mg/L		09/28/17 11:47	09/29/17 12:05	1
Benzo[a]pyrene	<0.0019		0.0019	0.00089	mg/L		09/28/17 11:47	09/29/17 12:05	1
Chrysene	<0.0019		0.0019	0.00084	mg/L		09/28/17 11:47	09/29/17 12:05	1
Dibenz(a,h)anthracene	<0.0019		0.0019	0.00078	mg/L		09/28/17 11:47	09/29/17 12:05	1
Fluoranthene	<0.0019		0.0019	0.0012	mg/L		09/28/17 11:47	09/29/17 12:05	1
Fluorene	<0.0019		0.0019	0.0011	mg/L		09/28/17 11:47	09/29/17 12:05	1
Indeno[1,2,3-cd]pyrene	<0.0019		0.0019	0.00077	mg/L		09/28/17 11:47	09/29/17 12:05	1
Naphthalene	<0.0019		0.0019	0.0018	mg/L		09/28/17 11:47	09/29/17 12:05	1
Phenanthrene	<0.0019		0.0019	0.0013	mg/L		09/28/17 11:47	09/29/17 12:05	1
Pyrene	<0.0019		0.0019	0.00092	mg/L		09/28/17 11:47	09/29/17 12:05	1
1-Methylnaphthalene	<0.0019		0.0019	0.00087	mg/L		09/28/17 11:47	09/29/17 12:05	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorophenol (Surr)	71		28 - 100	09/28/17 11:47	09/29/17 12:05	1
2,4,6-Tribromophenol (Surr)	90		33 - 103	09/28/17 11:47	09/29/17 12:05	1
Nitrobenzene-d5 (Surr)	78		36 - 100	09/28/17 11:47	09/29/17 12:05	1
Phenol-d5 (Surr)	71		33 - 100	09/28/17 11:47	09/29/17 12:05	1
Terphenyl-d14 (Surr)	77		20 - 106	09/28/17 11:47	09/29/17 12:05	1

Lab Sample ID: LCS 180-224319/2-A

Matrix: Solid

Analysis Batch: 224448

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 224319

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Acenaphthene	0.200	0.143		mg/L		71	40 - 100
Acenaphthylene	0.200	0.137		mg/L		68	36 - 100
Anthracene	0.200	0.145		mg/L		72	52 - 100
Benzo[a]anthracene	0.200	0.142		mg/L		71	51 - 100
Benzo[b]fluoranthene	0.200	0.132		mg/L		66	43 - 108
Benzo[k]fluoranthene	0.200	0.145		mg/L		73	51 - 100
Benzo[g,h,i]perylene	0.200	0.148		mg/L		74	51 - 100
Benzo[a]pyrene	0.200	0.140		mg/L		70	53 - 100
Chrysene	0.200	0.142		mg/L		71	51 - 100
Dibenz(a,h)anthracene	0.200	0.145		mg/L		73	52 - 100
Fluoranthene	0.200	0.157		mg/L		79	54 - 100
Fluorene	0.200	0.147		mg/L		73	41 - 100
Indeno[1,2,3-cd]pyrene	0.200	0.148		mg/L		74	50 - 100
Naphthalene	0.200	0.137		mg/L		68	34 - 100
Phenanthrene	0.200	0.141		mg/L		70	55 - 100
Pyrene	0.200	0.133		mg/L		66	53 - 100
1-Methylnaphthalene	0.200	0.145		mg/L		73	42 - 100

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 180-224319/2-A
Matrix: Solid
Analysis Batch: 224448

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 224319

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2-Fluorophenol (Surr)	67		28 - 100
2,4,6-Tribromophenol (Surr)	90		33 - 103
Nitrobenzene-d5 (Surr)	72		36 - 100
Phenol-d5 (Surr)	66		33 - 100
Terphenyl-d14 (Surr)	69		20 - 106

Lab Sample ID: LCSD 180-224319/3-A
Matrix: Solid
Analysis Batch: 224448

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 224319

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec.		RPD	Limit
							Limits	RPD		
Acenaphthene	0.200	0.147		mg/L		73	40 - 100	3	15	
Acenaphthylene	0.200	0.141		mg/L		70	36 - 100	3	15	
Anthracene	0.200	0.153		mg/L		77	52 - 100	5	15	
Benzo[a]anthracene	0.200	0.146		mg/L		73	51 - 100	3	15	
Benzo[b]fluoranthene	0.200	0.134		mg/L		67	43 - 108	2	17	
Benzo[k]fluoranthene	0.200	0.148		mg/L		74	51 - 100	1	16	
Benzo[g,h,i]perylene	0.200	0.151		mg/L		76	51 - 100	2	21	
Benzo[a]pyrene	0.200	0.142		mg/L		71	53 - 100	1	16	
Chrysene	0.200	0.146		mg/L		73	51 - 100	3	15	
Dibenz(a,h)anthracene	0.200	0.146		mg/L		73	52 - 100	1	21	
Fluoranthene	0.200	0.161		mg/L		81	54 - 100	3	18	
Fluorene	0.200	0.151		mg/L		76	41 - 100	3	20	
Indeno[1,2,3-cd]pyrene	0.200	0.150		mg/L		75	50 - 100	2	21	
Naphthalene	0.200	0.139		mg/L		69	34 - 100	1	15	
Phenanthrene	0.200	0.146		mg/L		73	55 - 100	4	15	
Pyrene	0.200	0.137		mg/L		68	53 - 100	3	15	
1-Methylnaphthalene	0.200	0.147		mg/L		74	42 - 100	1	15	

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
2-Fluorophenol (Surr)	68		28 - 100
2,4,6-Tribromophenol (Surr)	92		33 - 103
Nitrobenzene-d5 (Surr)	71		36 - 100
Phenol-d5 (Surr)	69		33 - 100
Terphenyl-d14 (Surr)	72		20 - 106

Lab Sample ID: LB 180-224042/1-D
Matrix: Solid
Analysis Batch: 224448

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 224319

Analyte	LB LB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Acenaphthene	<0.0018		0.0018	0.00068	mg/L		09/28/17 11:48	09/29/17 14:45	1
Acenaphthylene	<0.0018		0.0018	0.00057	mg/L		09/28/17 11:48	09/29/17 14:45	1
Anthracene	<0.0018		0.0018	0.00053	mg/L		09/28/17 11:48	09/29/17 14:45	1
Benzo[a]anthracene	<0.0018		0.0018	0.0011	mg/L		09/28/17 11:48	09/29/17 14:45	1
Benzo[b]fluoranthene	<0.0018		0.0018	0.00062	mg/L		09/28/17 11:48	09/29/17 14:45	1
Benzo[k]fluoranthene	<0.0018		0.0018	0.0017	mg/L		09/28/17 11:48	09/29/17 14:45	1
Benzo[g,h,i]perylene	<0.0018		0.0018	0.00077	mg/L		09/28/17 11:48	09/29/17 14:45	1

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Method: 8270C - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LB 180-224042/1-D
Matrix: Solid
Analysis Batch: 224448

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 224319

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]pyrene	<0.0018		0.0018	0.00084	mg/L		09/28/17 11:48	09/29/17 14:45	1
Chrysene	<0.0018		0.0018	0.00079	mg/L		09/28/17 11:48	09/29/17 14:45	1
Dibenz(a,h)anthracene	<0.0018		0.0018	0.00073	mg/L		09/28/17 11:48	09/29/17 14:45	1
Fluoranthene	<0.0018		0.0018	0.0011	mg/L		09/28/17 11:48	09/29/17 14:45	1
Fluorene	<0.0018		0.0018	0.0011	mg/L		09/28/17 11:48	09/29/17 14:45	1
Indeno[1,2,3-cd]pyrene	<0.0018		0.0018	0.00073	mg/L		09/28/17 11:48	09/29/17 14:45	1
Naphthalene	<0.0018		0.0018	0.0017	mg/L		09/28/17 11:48	09/29/17 14:45	1
Phenanthrene	<0.0018		0.0018	0.0012	mg/L		09/28/17 11:48	09/29/17 14:45	1
Pyrene	<0.0018		0.0018	0.00086	mg/L		09/28/17 11:48	09/29/17 14:45	1
1-Methylnaphthalene	<0.0018		0.0018	0.00082	mg/L		09/28/17 11:48	09/29/17 14:45	1

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorophenol (Surr)	65		28 - 100	09/28/17 11:48	09/29/17 14:45	1
2,4,6-Tribromophenol (Surr)	86		33 - 103	09/28/17 11:48	09/29/17 14:45	1
Nitrobenzene-d5 (Surr)	70		36 - 100	09/28/17 11:48	09/29/17 14:45	1
Phenol-d5 (Surr)	67		33 - 100	09/28/17 11:48	09/29/17 14:45	1
Terphenyl-d14 (Surr)	83		20 - 106	09/28/17 11:48	09/29/17 14:45	1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-224377/6
Matrix: Solid
Analysis Batch: 224377

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.0		1.0	0.71	mg/L			09/29/17 06:40	1

Lab Sample ID: LCS 180-224377/5
Matrix: Solid
Analysis Batch: 224377

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	25.0	25.0		mg/L		100	80 - 120

Lab Sample ID: LB 180-224042/1-A
Matrix: Solid
Analysis Batch: 224377

Client Sample ID: Method Blank
Prep Type: SPLP East

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.0		1.0	0.71	mg/L			09/29/17 08:33	1

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 180-224267/1-A
Matrix: Solid
Analysis Batch: 224466

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 224267

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	<0.0050		0.0050	0.00085	mg/L		09/28/17 09:02	09/29/17 09:54	1
Arsenic	<0.010		0.010	0.0041	mg/L		09/28/17 09:02	09/29/17 09:54	1
Barium	<0.20		0.20	0.0011	mg/L		09/28/17 09:02	09/29/17 09:54	1
Cadmium	<0.0050		0.0050	0.00016	mg/L		09/28/17 09:02	09/29/17 09:54	1
Chromium	<0.0050		0.0050	0.00078	mg/L		09/28/17 09:02	09/29/17 09:54	1
Lead	<0.010		0.010	0.0029	mg/L		09/28/17 09:02	09/29/17 09:54	1
Selenium	<0.010		0.010	0.0036	mg/L		09/28/17 09:02	09/29/17 09:54	1
Thallium	<0.020		0.020	0.0029	mg/L		09/28/17 09:02	09/29/17 09:54	1
Calcium	<5.0		5.0	0.088	mg/L		09/28/17 09:02	09/29/17 09:54	1
Magnesium	<5.0		5.0	0.045	mg/L		09/28/17 09:02	09/29/17 09:54	1
Calcium hardness as CaCO3	<13		13	0.22	mg/L		09/28/17 09:02	09/29/17 09:54	1

Lab Sample ID: LCS 180-224267/2-A
Matrix: Solid
Analysis Batch: 224466

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 224267

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Silver	0.0500	0.0526		mg/L		105	80 - 120
Arsenic	0.500	0.517		mg/L		103	80 - 120
Barium	2.00	1.99		mg/L		100	80 - 120
Cadmium	0.0500	0.0503		mg/L		101	80 - 120
Chromium	0.200	0.203		mg/L		101	80 - 120
Lead	0.500	0.506		mg/L		101	80 - 120
Selenium	0.500	0.520		mg/L		104	80 - 120
Thallium	0.500	0.500		mg/L		100	80 - 120
Calcium	50.0	52.2		mg/L		104	80 - 120
Magnesium	50.0	51.7		mg/L		103	80 - 120

Lab Sample ID: LCSD 180-224267/3-A
Matrix: Solid
Analysis Batch: 224466

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 224267

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Silver	0.0500	0.0533		mg/L		107	80 - 120	1	20
Arsenic	0.500	0.521		mg/L		104	80 - 120	1	20
Barium	2.00	2.00		mg/L		100	80 - 120	0	20
Cadmium	0.0500	0.0504		mg/L		101	80 - 120	0	20
Chromium	0.200	0.203		mg/L		101	80 - 120	0	20
Lead	0.500	0.507		mg/L		101	80 - 120	0	20
Selenium	0.500	0.523		mg/L		105	80 - 120	0	20
Thallium	0.500	0.503		mg/L		101	80 - 120	1	20
Calcium	50.0	52.3		mg/L		105	80 - 120	0	20
Magnesium	50.0	52.0		mg/L		104	80 - 120	1	20

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LB 180-224042/1-C
Matrix: Solid
Analysis Batch: 224466

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 224267

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	<0.0050		0.0050	0.00085	mg/L		09/28/17 09:02	09/29/17 10:09	1
Arsenic	<0.010		0.010	0.0041	mg/L		09/28/17 09:02	09/29/17 10:09	1
Barium	0.00136	J	0.20	0.0011	mg/L		09/28/17 09:02	09/29/17 10:09	1
Cadmium	<0.0050		0.0050	0.00016	mg/L		09/28/17 09:02	09/29/17 10:09	1
Chromium	<0.0050		0.0050	0.00078	mg/L		09/28/17 09:02	09/29/17 10:09	1
Lead	<0.010		0.010	0.0029	mg/L		09/28/17 09:02	09/29/17 10:09	1
Selenium	<0.010		0.010	0.0036	mg/L		09/28/17 09:02	09/29/17 10:09	1
Thallium	<0.020		0.020	0.0029	mg/L		09/28/17 09:02	09/29/17 10:09	1
Calcium	<5.0		5.0	0.088	mg/L		09/28/17 09:02	09/29/17 10:09	1
Magnesium	<5.0		5.0	0.045	mg/L		09/28/17 09:02	09/29/17 10:09	1
Calcium hardness as CaCO3	<13		13	0.22	mg/L		09/28/17 09:02	09/29/17 10:09	1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 180-224191/1-A
Matrix: Solid
Analysis Batch: 224284

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 224191

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000065	mg/L		09/27/17 13:50	09/28/17 09:38	1

Lab Sample ID: LCS 180-224191/2-A
Matrix: Solid
Analysis Batch: 224284

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 224191

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	0.00250	0.00255		mg/L		102	80 - 120

Lab Sample ID: LCSD 180-224191/3-A
Matrix: Solid
Analysis Batch: 224284

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 224191

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	0.00250	0.00241		mg/L		96	80 - 120	6	20

Lab Sample ID: LB 180-224042/1-B
Matrix: Solid
Analysis Batch: 224284

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 224191

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00020		0.00020	0.000065	mg/L		09/27/17 13:50	09/28/17 09:44	1

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Method: 9045D - pH

Lab Sample ID: LCS 180-223871/1
Matrix: Solid
Analysis Batch: 223871

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.1		SU		101	99 - 101

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 180-224358/2
Matrix: Solid
Analysis Batch: 224358

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<5.0		5.0	5.0	mg/L			09/28/17 14:00	1

Lab Sample ID: LCS 180-224358/1
Matrix: Solid
Analysis Batch: 224358

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	249	274		mg/L		110	85 - 115

Lab Sample ID: LB 180-224044/1-A
Matrix: Solid
Analysis Batch: 224358

Client Sample ID: Method Blank
Prep Type: ASTM Leach

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	<5.0		5.0	5.0	mg/L			09/28/17 14:00	1

Lab Sample ID: 240-85314-1 DU
Matrix: Solid
Analysis Batch: 224358

Client Sample ID: STEP 4 MIX-1
Prep Type: ASTM Leach

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Alkalinity	720		745		mg/L		3	20

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

GC/MS Semi VOA

Leach Batch: 224042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	1312	
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	1312	
LB 180-224042/1-D	Method Blank	SPLP East	Solid	1312	

Prep Batch: 224319

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	3520C	224042
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	3520C	224042
LB 180-224042/1-D	Method Blank	SPLP East	Solid	3520C	224042
MB 180-224319/1-A	Method Blank	Total/NA	Solid	3520C	
LCS 180-224319/2-A	Lab Control Sample	Total/NA	Solid	3520C	
LCSD 180-224319/3-A	Lab Control Sample Dup	Total/NA	Solid	3520C	

Analysis Batch: 224448

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	8270C	224319
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	8270C	224319
LB 180-224042/1-D	Method Blank	SPLP East	Solid	8270C	224319
MB 180-224319/1-A	Method Blank	Total/NA	Solid	8270C	224319
LCS 180-224319/2-A	Lab Control Sample	Total/NA	Solid	8270C	224319
LCSD 180-224319/3-A	Lab Control Sample Dup	Total/NA	Solid	8270C	224319

HPLC/IC

Leach Batch: 224042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	1312	
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	1312	
LB 180-224042/1-A	Method Blank	SPLP East	Solid	1312	

Analysis Batch: 224377

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	9056A	224042
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	9056A	224042
LB 180-224042/1-A	Method Blank	SPLP East	Solid	9056A	224042
MB 180-224377/6	Method Blank	Total/NA	Solid	9056A	
LCS 180-224377/5	Lab Control Sample	Total/NA	Solid	9056A	

Metals

Leach Batch: 224042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	1312	
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	1312	
LB 180-224042/1-B	Method Blank	SPLP East	Solid	1312	
LB 180-224042/1-C	Method Blank	SPLP East	Solid	1312	

Prep Batch: 224191

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	7470A	224042

TestAmerica Canton

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Metals (Continued)

Prep Batch: 224191 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	7470A	224042
LB 180-224042/1-B	Method Blank	SPLP East	Solid	7470A	224042
MB 180-224191/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 180-224191/2-A	Lab Control Sample	Total/NA	Solid	7470A	
LCSD 180-224191/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	

Prep Batch: 224267

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	3010A	224042
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	3010A	224042
LB 180-224042/1-C	Method Blank	SPLP East	Solid	3010A	224042
MB 180-224267/1-A	Method Blank	Total/NA	Solid	3010A	
LCS 180-224267/2-A	Lab Control Sample	Total/NA	Solid	3010A	
LCSD 180-224267/3-A	Lab Control Sample Dup	Total/NA	Solid	3010A	

Analysis Batch: 224284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	7470A	224191
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	7470A	224191
LB 180-224042/1-B	Method Blank	SPLP East	Solid	7470A	224191
MB 180-224191/1-A	Method Blank	Total/NA	Solid	7470A	224191
LCS 180-224191/2-A	Lab Control Sample	Total/NA	Solid	7470A	224191
LCSD 180-224191/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	224191

Analysis Batch: 224466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	6010B	224267
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	6010B	224267
LB 180-224042/1-C	Method Blank	SPLP East	Solid	6010B	224267
MB 180-224267/1-A	Method Blank	Total/NA	Solid	6010B	224267
LCS 180-224267/2-A	Lab Control Sample	Total/NA	Solid	6010B	224267
LCSD 180-224267/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	224267

General Chemistry

Analysis Batch: 223871

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	Total/NA	Solid	9045D	
240-85314-2	STEP 4 MIX-2	Total/NA	Solid	9045D	
LCS 180-223871/1	Lab Control Sample	Total/NA	Solid	9045D	

Leach Batch: 224044

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	ASTM Leach	Solid	D3987-85	
240-85314-2	STEP 4 MIX-2	ASTM Leach	Solid	D3987-85	
LB 180-224044/1-A	Method Blank	ASTM Leach	Solid	D3987-85	
240-85314-1 DU	STEP 4 MIX-1	ASTM Leach	Solid	D3987-85	

TestAmerica Canton

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

General Chemistry (Continued)

Analysis Batch: 224358

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	ASTM Leach	Solid	SM 2320B	224044
240-85314-2	STEP 4 MIX-2	ASTM Leach	Solid	SM 2320B	224044
LB 180-224044/1-A	Method Blank	ASTM Leach	Solid	SM 2320B	224044
MB 180-224358/2	Method Blank	Total/NA	Solid	SM 2320B	
LCS 180-224358/1	Lab Control Sample	Total/NA	Solid	SM 2320B	
240-85314-1 DU	STEP 4 MIX-1	ASTM Leach	Solid	SM 2320B	224044

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Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Client Sample ID: STEP 4 MIX-1

Date Collected: 09/18/17 15:30

Date Received: 09/19/17 09:15

Lab Sample ID: 240-85314-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			224042	09/26/17 15:30	JPM	TAL PIT
SPLP East	Prep	3520C			224319	09/28/17 11:47	BJT	TAL PIT
SPLP East	Analysis	8270C		1	224448	09/29/17 19:20	VVP	TAL PIT
SPLP East	Leach	1312			224042	09/26/17 15:30	JPM	TAL PIT
SPLP East	Analysis	9056A		1	224377	09/29/17 09:52	MJH	TAL PIT
SPLP East	Leach	1312			224042	09/26/17 15:30	JPM	TAL PIT
SPLP East	Prep	3010A			224267	09/28/17 09:02	KA	TAL PIT
SPLP East	Analysis	6010B		1	224466	09/29/17 10:14	RJG	TAL PIT
SPLP East	Leach	1312			224042	09/26/17 15:30	JPM	TAL PIT
SPLP East	Prep	7470A			224191	09/27/17 13:50	RJR	TAL PIT
SPLP East	Analysis	7470A		1	224284	09/28/17 09:46	RJR	TAL PIT
Total/NA	Analysis	9045D		1	223871	09/25/17 15:07	RMA	TAL PIT
ASTM Leach	Leach	D3987-85			224044	09/26/17 15:30	JPM	TAL PIT
ASTM Leach	Analysis	SM 2320B		1	224358	09/28/17 14:00	CLL	TAL PIT

Client Sample ID: STEP 4 MIX-2

Date Collected: 09/18/17 15:30

Date Received: 09/19/17 09:15

Lab Sample ID: 240-85314-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			224042	09/26/17 15:30	JPM	TAL PIT
SPLP East	Prep	3520C			224319	09/28/17 11:48	BJT	TAL PIT
SPLP East	Analysis	8270C		1	224448	09/29/17 19:47	VVP	TAL PIT
SPLP East	Leach	1312			224042	09/26/17 15:30	JPM	TAL PIT
SPLP East	Analysis	9056A		1	224377	09/29/17 08:48	MJH	TAL PIT
SPLP East	Leach	1312			224042	09/26/17 15:30	JPM	TAL PIT
SPLP East	Prep	3010A			224267	09/28/17 09:02	KA	TAL PIT
SPLP East	Analysis	6010B		1	224466	09/29/17 10:20	RJG	TAL PIT
SPLP East	Leach	1312			224042	09/26/17 15:30	JPM	TAL PIT
SPLP East	Prep	7470A			224191	09/27/17 13:50	RJR	TAL PIT
SPLP East	Analysis	7470A		1	224284	09/28/17 09:48	RJR	TAL PIT
Total/NA	Analysis	9045D		1	223871	09/25/17 15:08	RMA	TAL PIT
ASTM Leach	Leach	D3987-85			224044	09/26/17 15:30	JPM	TAL PIT
ASTM Leach	Analysis	SM 2320B		1	224358	09/28/17 14:00	CLL	TAL PIT

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Accreditation/Certification Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-1

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-18 *
Connecticut	State Program	1	PH-0590	12-31-17 *
Florida	NELAP	4	E87225	06-30-18
Illinois	NELAP	5	200004	07-31-18
Kansas	NELAP	7	E-10336	01-31-18 *
Kentucky (UST)	State Program	4	58	02-23-18 *
Kentucky (WW)	State Program	4	98016	12-31-17 *
Minnesota	NELAP	5	039-999-348	12-31-18
Minnesota (Petrofund)	State Program	1	3506	07-31-18
Nevada	State Program	9	OH-000482008A	07-31-18
New Jersey	NELAP	2	OH001	06-30-18
New York	NELAP	2	10975	03-31-18 *
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-18 *
Pennsylvania	NELAP	3	68-00340	08-31-18
Texas	NELAP	6	T104704517-17-9	08-31-18
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18
Washington	State Program	10	C971	01-12-18 *
West Virginia DEP	State Program	3	210	12-31-18

Laboratory: TestAmerica Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	A2LA		PA00164	07-31-18
Arkansas DEQ	State Program	6	88-0690	06-27-18
California	State Program	9	2891	03-31-18
Connecticut	State Program	1	PH-0688	09-30-18
Florida	NELAP	4	E871008	06-30-18
Illinois	NELAP	5	200005	06-30-18
Kansas	NELAP	7	E-10350	01-31-18
Louisiana	NELAP	6	04041	06-30-18
Nevada	State Program	9	PA00164	07-31-18
New Hampshire	NELAP	1	2030	04-04-18
New Jersey	NELAP	2	PA005	06-30-18
New York	NELAP	2	11182	03-31-18
North Carolina (WW/SW)	State Program	4	434	12-31-18
Pennsylvania	NELAP	3	02-00416	04-30-18
South Carolina	State Program	4	89014	04-30-18
Texas	NELAP	6	T104704528-15-2	03-31-18
US Fish & Wildlife	Federal		LE94312A-1	07-31-18
USDA	Federal		P330-16-00211	06-26-19
Utah	NELAP	8	PA001462015-4	05-31-18
Virginia	NELAP	3	460189	09-14-18
West Virginia DEP	State Program	3	142	01-31-18
Wisconsin	State Program	5	998027800	08-31-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Canton

TestAmerica Canton Sample Receipt Form/Narrative

Login # : 85214

Canton Facility

Client ARCADIS Site Name _____

Cooler unpacked by: [Signature]

Cooler Received on 9/19/17 Opened on 9/19/17

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____
 Packing material used: Bubble Wrap Foam Plastic Bag None Other _____
 COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
 IR GUN# IR-8 (CF +0 °C) Observed Cooler Temp. 0.4 °C Corrected Cooler Temp. 0.4 °C
 IR GUN #36 (CF +0.3 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN # 627 (CF -1.3 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____ Yes No
 -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No NA
 -Were tamper/custody seals intact and uncompromised? Yes No

3. Shippers' packing slip attached to the cooler(s)? Yes No
 4. Did custody papers accompany the sample(s)? Yes No
 5. Were the custody papers relinquished & signed in the appropriate place? Yes No
 6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
 7. Did all bottles arrive in good condition (Unbroken)? Yes No
 8. Could all bottle labels be reconciled with the COC? Yes No
 9. Were correct bottle(s) used for the test(s) indicated? Yes No
 10. Sufficient quantity received to perform indicated analyses? Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

11. Are these work share samples? If yes, Questions 11-15 have been checked at the originating laboratory.
 11. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC697954
 12. Were VOAs on the COC? Yes No
 13. Were air bubbles >6 mm in any VOA vials? Yes No Larger than this.
 14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
 15. Was a LL Hg or Me Hg trip blank present? Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____

Concerning _____

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: _____

17. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
 Sample(s) _____ were received in a broken container.
 Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

18. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
 Time preserved: _____ Preservative(s) added/Lot number(s): _____

Ref: SOP NC-SC-0005, Sample Receiving
 \\nacorp\corp\QA\QA_Facilities\Canton-QA\Document-Management\Work-Instruction\Word Version Work Instructions\WI-NC-099-091117 Cooler Receipt Form (3).doc djl

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FedEx Express

Temperature Controlled

IF TEMPERATURE CONTROLLED

IS NOT TO BE OPENED IN TRANSIT, STORE AS INDICATED.

Healthcare

Room 15' to 18' F

Refrigerated 2' to 8' F

Frozen -25' to -10' F

167074 REV 3/15

RT 97
FZ B02
6
15:00
1525
09:22
A



ORIGIN ID: PHDA (330) 966-9677
AL HAIDET
TESTAMERICA
4101 SHUFFEL DR
NORTH CANTON, OH 44720
UNITED STATES US

SHIP DATE: 21SEP17
ACTWGT: 17.40 LB
CAD: 507102/CAFE3011

BILL RECIPIENT

TO ENVIRONMENTAL SAMPLE RECEIPT
TESTAMERICA PITTSBURGH
301 ALPHA DRIVE
RIDC PARK
PITTSBURGH PA 15238

(412) 963-7069 REF: S240-45787
DEPT: AL HAIDET

FedEx Express

TRK# 7420 8483 1525
0201

FRI - 22 SEP 3:00P
STANDARD OVERNIGHT

65 AGCA

15238
PA-US PIT

Uncorrected temp 3.5 °C
Thermometer ID TL

CF 0 Initials TS

PT-WI-SR-001 effective 7/26/13

TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone (330) 497-9396 Fax (330) 497-0772

Chain of Custody Record



TestAmerica
IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab) Shipping/Receiving TestAmerica Laboratories, Inc. Address: 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238 Phone: 412-963-7058 (Tel) 412-963-2468 (Fax) Email:		Lab PM: Howell, Leslie E-Mail: leslie.howell@testamericainc.com Accreditations Required (See note): Wisconsin	
Client Information (Sub Contract Lab) 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238 Phone: 412-963-7058 (Tel) 412-963-2468 (Fax) Email:		Job #: 240-85314-1 Page 1 of 1	
Due Date Requested: 9/29/2017 TAT Requested (days):		Analysis Requested 9056A_ORGFM_28D/1312_E (MOD) Chloride 8270C/1312_E PAH Analyte List 2320B/ASTM_LEACH_NP Alkalinity 2340C/1315_WC 6010B/1312_E_M (MOD) SPLP Metals 7470A/1312_E_Hg TCLP Mercury	
Sample Identification - Client ID (Lab ID) STEP 4 MIX-1 (240-85314-1) STEP 4 MIX-2 (240-85314-2)		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Anichlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:	
Sample Date 9/18/17 9/18/17		Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/>	
Sample Time 15:30 Central 15:30 Central		Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/>	
Sample Type (C=Comp, G=grab) Solid Solid		Total Number of Containers 1 1	
Matrix (W=water, S=solid, D=wastmill, B1=TOXUS, A=As) Solid Solid		Special Instructions/Note:	
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.			
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify)			
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Special Instructions/QC Requirements:			
Empty Kit Relinquished by:		Method of Shipment:	
Relinquished by: <i>[Signature]</i>		Date/Time: 9-22-17 Company: TAT	
Relinquished by:		Date/Time: 9/05 Company:	
Relinquished by:		Date/Time:	
Custody Seals Intact A Yes A No		Cooler Temperature(s) °C and Other Remarks:	

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Chain of Custody Record



240-85314 Chain of Custody

Client Information (Sub Contract Lab)		Lab PM: Howell, Leslie	COC No: 240-77045.1				
Client Contact: Shipping/Receiving		E-Mail: leslie.howell@testamericainc.com	Page: Page 1 of 1				
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):	Job #: 240-85314-1				
Address: 30 Community Drive, Suite 11, South Burlington, VT, 05403		Due Date Requested: 9/29/2017	Analysis Requested				
State, Zip: VT, 05403		TAT Requested (days):					
Phone: 802-660-1990(Tel) 802-660-1919(Fax)		PO #:	Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2OAS Q - Na2SO3 R - Na2SO4 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 L - EDTA Z - other (specify) Other:				
Email:		WO #:					
Project Name: Howard's Bay		Project #: 24018568	Special Instructions/Note: WI compliance needed. WI compliance needed.				
Site:		SSOW#:					
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Organotins GC/1312 E	Total Number of Containers
STEP 4 MIX-1 (240-85314-1)	9/18/17	15:30 Central	Solid	Solid	X	X	1
STEP 4 MIX-2 (240-85314-2)	9/18/17	15:30 Central	Solid	Solid	X	X	1
<p>Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.</p>							
Possible Hazard Identification							
<input type="checkbox"/> Unconfirmed <input type="checkbox"/> Deliverable Requested: I, II, III, IV, Other (specify) _____							
<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab _____ Archive For _____ Months							
<input type="checkbox"/> Empty Kit Relinquished by: _____ Date: _____ Time: _____ Method of Shipment: _____							
<input type="checkbox"/> Relinquished by: _____ Date/Time: 9/22/17 Company: TAB 02L <input type="checkbox"/> Relinquished by: _____ Date/Time: _____ Company: _____ <input type="checkbox"/> Relinquished by: _____ Date/Time: _____ Company: _____							
Custody Seals Intact: _____ Δ Yes Δ No							
Cooler Temperature(s) °C and Other Remarks: 3.1							



ORIGIN ID: PHDA (330) 966-9677
AL HAIDET
TESTAMERICA
4101 SHUFFEL DR

SHIP DATE: 21SEP17
ACTWGT: 15.15 LB
CAD: 507102/CAFE3011

NORTH CANTON, OH 44720
UNITED STATES US

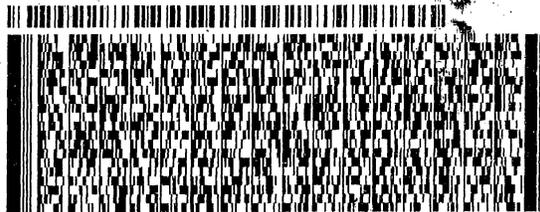
BILL RECIPIENT

TO **ENVIRONMENTAL SAMPLE RECEIPT**
TESTAMERICA BURLINGTON
30 COMMUNITY DRIVE

SOUTH BURLINGTON VT 05403

(802) 660-1990
DEPT: AL HAIDET

REF: S240-45787



FedEx
Express



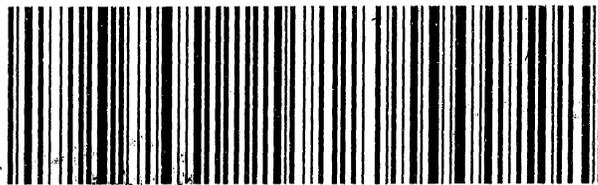
J16121610100131

TRK# 7420 8483 1514
0201

FRI - 22 SEP 3:00P
STANDARD OVERNIGHT

NC BTVA

05403
VT-US **BTVA**



Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 240-85314-1

Login Number: 85314
List Number: 2
Creator: Watson, Debbie

List Source: TestAmerica Pittsburgh
List Creation: 09/22/17 12:41 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

STEP 4 - ORGANOTINS



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-85314-2
Client Project/Site: Howard's Bay

For:
ARCADIS U.S. Inc
4915 Prospectus Drive
Suite F
Durham, North Carolina 27713

Attn: Andy Baumeister



Authorized for release by:
11/7/2017 4:37:03 PM

Leslie Howell, Project Manager I
(330)497-9396
leslie.howell@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-2

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
*	RPD of the LCS and LCSD exceeds the control limits
*	LCS or LCSD is outside acceptance limits.
cn	Refer to Case Narrative for further detail

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-2

Job ID: 240-85314-2

Laboratory: TestAmerica Canton

Narrative

**Job Narrative
240-85314-2**

Comments

No additional comments.

Receipt

The samples were received on 9/19/2017 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.4° C.

GC/MS Semi VOA

Method(s) Organotins/GCMS: Monobutyltin has been identified as a poor performing analyte when analyzed using this method. The laboratory control limits are not based on historical performance and do not indicate expected performance of this analyte by this method. The laboratory does not use the performance of Monobutyltin as the basis for acceptance of the analytical batch. All analytical results, both detects and non-detects, are considered qualitative and are therefore flagged with a "cn" qualifier. The affected samples include: STEP 4 MIX-1 (240-85314-1), STEP 4 MIX-2 (240-85314-2), (LB 200-121609/1-B), (LCS 200-121609/2-B) and (LCSD 200-121609/3-B).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method(s) 1312: A deviation from the Standard Operating Procedure (SOP) occurred. Details are as follows: The container for sample 240-85314-1 only contained about 70 g of sample. 100 g of sample is required for this method. The volume of SPLP fluid added to the sample was scaled down to 1400 mL instead of 2000 mL to account for the smaller amount of sample.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-2

Method	Method Description	Protocol	Laboratory
Organotins/GCMS	Organotins (GC/MS)	TAL SOP	TAL BUR

Protocol References:

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

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Sample Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-85314-1	STEP 4 MIX-1	Solid	09/18/17 15:30	09/19/17 09:15
240-85314-2	STEP 4 MIX-2	Solid	09/18/17 15:30	09/19/17 09:15

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Detection Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-2

Client Sample ID: STEP 4 MIX-1

Lab Sample ID: 240-85314-1

No Detections.

Client Sample ID: STEP 4 MIX-2

Lab Sample ID: 240-85314-2

No Detections.

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This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-2

Client Sample ID: STEP 4 MIX-1

Lab Sample ID: 240-85314-1

Date Collected: 09/18/17 15:30

Matrix: Solid

Date Received: 09/19/17 09:15

Method: Organotins/GCMS - Organotins (GC/MS) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<0.054		0.054	0.054	ug/Kg		10/09/17 17:15	11/02/17 14:34	1
Tributyltin	<0.048		0.048	0.048	ug/Kg		10/09/17 17:15	11/02/17 14:34	1
Dibutyltin	<0.041	*	0.041	0.041	ug/Kg		10/09/17 17:15	11/02/17 14:34	1
Monobutyltin	<0.66	* cn	0.66	0.66	ug/Kg		10/09/17 17:15	11/02/17 14:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	68		30 - 120				10/09/17 17:15	11/02/17 14:34	1

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-2

Client Sample ID: STEP 4 MIX-2

Lab Sample ID: 240-85314-2

Date Collected: 09/18/17 15:30

Matrix: Solid

Date Received: 09/19/17 09:15

Method: Organotins/GCMS - Organotins (GC/MS) - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<0.050		0.050	0.050	ug/Kg		10/09/17 17:15	11/02/17 14:56	1
Tributyltin	<0.044		0.044	0.044	ug/Kg		10/09/17 17:15	11/02/17 14:56	1
Dibutyltin	<0.038	*	0.038	0.038	ug/Kg		10/09/17 17:15	11/02/17 14:56	1
Monobutyltin	<0.61	* cn	0.61	0.61	ug/Kg		10/09/17 17:15	11/02/17 14:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	72		30 - 120				10/09/17 17:15	11/02/17 14:56	1

Surrogate Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-2

Method: Organotins/GCMS - Organotins (GC/MS)

Matrix: Solid

Prep Type: SPLP East

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	TPT (30-120)
240-85314-1	STEP 4 MIX-1	68
240-85314-2	STEP 4 MIX-2	72
LB 200-121609/1-B	Method Blank	53
LCS 200-121609/2-B	Lab Control Sample	64
LCSD 200-121609/3-B	Lab Control Sample Dup	60

Surrogate Legend

TPT = Triphenyltin

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QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-2

Method: Organotins/GCMS - Organotins (GC/MS)

Lab Sample ID: LB 200-121609/1-B
Matrix: Solid
Analysis Batch: 122993

Client Sample ID: Method Blank
Prep Type: SPLP East
Prep Batch: 121933

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrabutyltin	<0.049		0.049	0.049	ug/Kg		10/09/17 17:15	11/02/17 13:28	1
Tributyltin	<0.043		0.043	0.043	ug/Kg		10/09/17 17:15	11/02/17 13:28	1
Dibutyltin	<0.037		0.037	0.037	ug/Kg		10/09/17 17:15	11/02/17 13:28	1
Monobutyltin	<0.59	cn	0.59	0.59	ug/Kg		10/09/17 17:15	11/02/17 13:28	1

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tripentyltin	53		30 - 120	10/09/17 17:15	11/02/17 13:28	1

Lab Sample ID: LCS 200-121609/2-B
Matrix: Solid
Analysis Batch: 122993

Client Sample ID: Lab Control Sample
Prep Type: SPLP East
Prep Batch: 121933

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Tetrabutyltin	0.479	0.376		ug/Kg		79	30 - 160
Tributyltin	0.426	0.153		ug/Kg		36	30 - 160
Dibutyltin	0.369	0.143		ug/Kg		39	30 - 160
Monobutyltin	1.48	<0.59	* cn	ug/Kg		8	10 - 48

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Tripentyltin	64		30 - 120

Lab Sample ID: LCSD 200-121609/3-B
Matrix: Solid
Analysis Batch: 122993

Client Sample ID: Lab Control Sample Dup
Prep Type: SPLP East
Prep Batch: 121933

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Tetrabutyltin	0.479	0.423		ug/Kg		88	30 - 160	12	30
Tributyltin	0.426	0.156		ug/Kg		37	30 - 160	2	30
Dibutyltin	0.369	0.209	*	ug/Kg		57	30 - 160	38	30
Monobutyltin	1.48	<0.59	cn	ug/Kg		10	10 - 48	15	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Tripentyltin	60		30 - 120

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-2

GC/MS Semi VOA

Leach Batch: 121609

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	1312	
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	1312	
LB 200-121609/1-B	Method Blank	SPLP East	Solid	1312	
LCS 200-121609/2-B	Lab Control Sample	SPLP East	Solid	1312	
LCSD 200-121609/3-B	Lab Control Sample Dup	SPLP East	Solid	1312	

Prep Batch: 121933

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	3510C	121609
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	3510C	121609
LB 200-121609/1-B	Method Blank	SPLP East	Solid	3510C	121609
LCS 200-121609/2-B	Lab Control Sample	SPLP East	Solid	3510C	121609
LCSD 200-121609/3-B	Lab Control Sample Dup	SPLP East	Solid	3510C	121609

Analysis Batch: 122993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-85314-1	STEP 4 MIX-1	SPLP East	Solid	Organotins/GCM S	121933
240-85314-2	STEP 4 MIX-2	SPLP East	Solid	Organotins/GCM S	121933
LB 200-121609/1-B	Method Blank	SPLP East	Solid	Organotins/GCM S	121933
LCS 200-121609/2-B	Lab Control Sample	SPLP East	Solid	Organotins/GCM S	121933
LCSD 200-121609/3-B	Lab Control Sample Dup	SPLP East	Solid	Organotins/GCM S	121933

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-2

Client Sample ID: STEP 4 MIX-1

Date Collected: 09/18/17 15:30

Date Received: 09/19/17 09:15

Lab Sample ID: 240-85314-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			121609	10/02/17 17:30	JM1	TAL BUR
SPLP East	Prep	3510C			121933	10/09/17 17:15	JM1	TAL BUR
SPLP East	Analysis	Organotins/GCMS		1	122993	11/02/17 14:34	DJB	TAL BUR

Client Sample ID: STEP 4 MIX-2

Date Collected: 09/18/17 15:30

Date Received: 09/19/17 09:15

Lab Sample ID: 240-85314-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			121609	10/02/17 17:30	JM1	TAL BUR
SPLP East	Prep	3510C			121933	10/09/17 17:15	JM1	TAL BUR
SPLP East	Analysis	Organotins/GCMS		1	122993	11/02/17 14:56	DJB	TAL BUR

Laboratory References:

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Accreditation/Certification Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 240-85314-2

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-18
Connecticut	State Program	1	PH-0590	12-31-17 *
Florida	NELAP	4	E87225	06-30-18
Illinois	NELAP	5	200004	07-31-18
Kansas	NELAP	7	E-10336	01-31-18 *
Kentucky (UST)	State Program	4	58	02-23-18
Kentucky (WW)	State Program	4	98016	12-31-17 *
Minnesota	NELAP	5	039-999-348	12-31-17 *
Minnesota (Petrofund)	State Program	1	3506	07-31-18
Nevada	State Program	9	OH-000482008A	07-31-18
New Jersey	NELAP	2	OH001	06-30-18
New York	NELAP	2	10975	03-31-18
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-18
Pennsylvania	NELAP	3	68-00340	08-31-18
Texas	NELAP	6	T104704517-17-9	08-31-18
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18
Washington	State Program	10	C971	01-12-18 *
West Virginia DEP	State Program	3	210	12-31-17 *

Laboratory: TestAmerica Burlington

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	NA	02-02-18
Florida	NELAP	4	E87467	06-30-18
L-A-B	DoD ELAP		L2336	02-25-20
Maine	State Program	1	VT00008	04-17-19
Minnesota	NELAP	5	050-999-436	12-31-17
New Hampshire	NELAP	1	2006	12-18-17
New Jersey	NELAP	2	VT972	06-30-18
New York	NELAP	2	10391	04-01-18
Pennsylvania	NELAP	3	68-00489	04-30-18
Rhode Island	State Program	1	LAO00298	12-30-17
US Fish & Wildlife	Federal		LE-058448-0	07-31-18
USDA	Federal		P330-11-00093	12-05-19
Vermont	State Program	1	VT-4000	12-31-17
Virginia	NELAP	3	460209	12-14-17

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Canton Sample Receipt Form/Narrative

Login #: 85214

Canton Facility

Client ARCADIS Site Name

Cooler unpacked by: [Signature]

Cooler Received on 9/19/17 Opened on 9/19/17

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # Foam Box Client Cooler Box Other
Packing material used: Bubble Wrap Foam Plastic Bag None Other
COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt
IR GUN# IR-8 (CF +0 °C) Observed Cooler Temp. 0.4 °C Corrected Cooler Temp. 0.4 °C
IR GUN #36 (CF +0.3 °C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
IR GUN # 627 (CF -1.3 °C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity Yes No
-Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No NA
-Were tamper/custody seals intact and uncompromised? Yes No NA

3. Shippers' packing slip attached to the cooler(s)? Yes No

4. Did custody papers accompany the sample(s)? Yes No

5. Were the custody papers relinquished & signed in the appropriate place? Yes No

6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No

7. Did all bottles arrive in good condition (Unbroken)? Yes No

8. Could all bottle labels be reconciled with the COC? Yes No

9. Were correct bottle(s) used for the test(s) indicated? Yes No

10. Sufficient quantity received to perform indicated analyses? Yes No

11. Are these work share samples? Yes No

If yes, Questions 11-15 have been checked at the originating laboratory.

11. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC697954

12. Were VOAs on the COC? Yes No

13. Were air bubbles >6 mm in any VOA vials? Yes No NA Larger than this.

14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Yes No

15. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving: VOAs Oil and Grease TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by:

[Blank lines for Chain of Custody]

17. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

18. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

Ref: SOP NC-SC-0005, Sample Receiving
\\nacorp\corp\QA\QA_Facilities\Canton-QA\Document-Management\Work-Instruction\Word Version Work Instructions\WI-NC-099-091117 Cooler Receipt Form (3).doc djl

FedEx Express

Temperature Controlled

IF TEMPERATURE CONTROLLED

IS NOT TO BE OPENED IN TRANSIT, STORE AS INDICATED.

Healthcare

Room 15' to 18' F

Refrigerated 2' to 8' F

Frozen -25' to -10' F

167074 REV 3/15

RT 97
FZ B02
6
15:00
1525
09:22
A



ORIGIN ID: PHDA (330) 966-9677
AL HAIDET
TESTAMERICA
4101 SHUFFEL DR
NORTH CANTON, OH 44720
UNITED STATES US

SHIP DATE: 21SEP17
ACTWGT: 17.40 LB
CAD: 507102/CAFE3011

BILL RECIPIENT

TO ENVIRONMENTAL SAMPLE RECEIPT
TESTAMERICA PITTSBURGH
301 ALPHA DRIVE
RIDC PARK
PITTSBURGH PA 15238

(412) 963-7069 REF: S240-45787
DEPT: AL HAIDET

FedEx Express

TRK# 7420 8483 1525
0201

FRI - 22 SEP 3:00P
STANDARD OVERNIGHT

65 AGCA

15238
PA-US PIT

Uncorrected temp 3.5 °C
Thermometer ID TL

CF 0 Initials TS

PT-WI-SR-001 effective 7/26/13

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Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 240-85314-2

Login Number: 85314

List Number: 3

Creator: Deason, Barbara N

List Source: TestAmerica Burlington

List Creation: 09/22/17 12:48 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.1 °C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



STEP 1 AND STEP 4 - SPECIFIC CONDUCTANCE



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Pittsburgh

301 Alpha Drive

RIDC Park

Pittsburgh, PA 15238

Tel: (412)963-7058

TestAmerica Job ID: 180-74488-1

Client Project/Site: Howard's Bay

For:

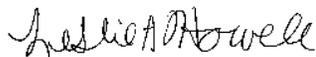
ARCADIS U.S. Inc

4915 Prospectus Drive

Suite G

Durham, North Carolina 27713

Attn: Andy Baumeister



Authorized for release by:

2/13/2018 1:47:57 PM

Leslie Howell, Project Manager I

(330)497-9396

leslie.howell@testamericainc.com

LINKS

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results through

Total Access

Have a Question?



Visit us at:

www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 180-74488-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Accreditation/Certification Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 180-74488-1

Laboratory: TestAmerica Pittsburgh

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Wisconsin	State Program	5	998027800	08-31-18

Analysis Method	Prep Method	Matrix	Analyte

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-18 *
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-18
Illinois	NELAP	5	200004	07-31-18
Kansas	NELAP	7	E-10336	01-31-18 *
Kentucky (UST)	State Program	4	58	02-23-18 *
Kentucky (WW)	State Program	4	98016	12-31-18
Minnesota	NELAP	5	039-999-348	12-31-18
Minnesota (Petrofund)	State Program	1	3506	07-31-18
Nevada	State Program	9	OH-000482008A	07-31-18
New Jersey	NELAP	2	OH001	06-30-18
New York	NELAP	2	10975	03-31-18 *
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-18 *
Pennsylvania	NELAP	3	68-00340	08-31-18
Texas	NELAP	6	T104704517-17-9	08-31-18
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18

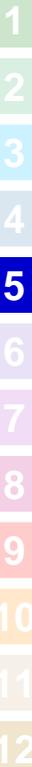
* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Sample Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 180-74488-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
180-74488-1	HB17-01	Solid	01/25/18 13:00	01/26/18 09:00
180-74488-2	HB17-02	Solid	01/25/18 13:00	01/26/18 09:00
180-74488-3	HB17-03	Solid	01/25/18 13:00	01/26/18 09:00
180-74488-4	HB17-04	Solid	01/25/18 13:00	01/26/18 09:00
180-74488-5	HB17-05	Solid	01/25/18 13:00	01/26/18 09:00
180-74488-6	HB17-06	Solid	01/25/18 13:00	01/26/18 09:00
180-74488-7	HB17-07	Solid	01/25/18 13:00	01/26/18 09:00
180-74488-8	HB17-08	Solid	01/25/18 13:00	01/26/18 09:00
180-74488-9	STEP 4 MIX-1	Solid	01/25/18 13:00	01/26/18 09:00
180-74488-10	STEP 4 MIX-2	Solid	01/25/18 13:00	01/26/18 09:00



Method Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 180-74488-1

Method	Method Description	Protocol	Laboratory
EPA 9050A	Specific Conductance	SW846	TAL PIT

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

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Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 180-74488-1

Client Sample ID: HB17-01

Date Collected: 01/25/18 13:00

Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			100.36 g	2000 mL	236097	02/05/18 16:00	JPM	TAL PIT
SPLP East	Analysis	EPA 9050A		1			236316	02/07/18 10:48	KXW	TAL PIT
Instrument ID: NOEQUIP										

Client Sample ID: HB17-02

Date Collected: 01/25/18 13:00

Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			100.42 g	2000 mL	236097	02/05/18 16:00	JPM	TAL PIT
SPLP East	Analysis	EPA 9050A		1			236316	02/07/18 10:48	KXW	TAL PIT
Instrument ID: NOEQUIP										

Client Sample ID: HB17-03

Date Collected: 01/25/18 13:00

Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			100.29 g	2000 mL	236097	02/05/18 16:00	JPM	TAL PIT
SPLP East	Analysis	EPA 9050A		1			236316	02/07/18 10:48	KXW	TAL PIT
Instrument ID: NOEQUIP										

Client Sample ID: HB17-04

Date Collected: 01/25/18 13:00

Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-4

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			100.36 g	2000 mL	236097	02/05/18 16:00	JPM	TAL PIT
SPLP East	Analysis	EPA 9050A		1			236316	02/07/18 10:48	KXW	TAL PIT
Instrument ID: NOEQUIP										

Client Sample ID: HB17-05

Date Collected: 01/25/18 13:00

Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-5

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			100.24 g	2000 mL	236097	02/05/18 16:00	JPM	TAL PIT
SPLP East	Analysis	EPA 9050A		1			236316	02/07/18 10:48	KXW	TAL PIT
Instrument ID: NOEQUIP										

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 180-74488-1

Client Sample ID: HB17-06

Lab Sample ID: 180-74488-6

Date Collected: 01/25/18 13:00

Matrix: Solid

Date Received: 01/26/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			100.15 g	2000 mL	236097	02/05/18 16:00	JPM	TAL PIT
SPLP East	Analysis	EPA 9050A		1			236316	02/07/18 10:48	KXW	TAL PIT
Instrument ID: NOEQUIP										

Client Sample ID: HB17-07

Lab Sample ID: 180-74488-7

Date Collected: 01/25/18 13:00

Matrix: Solid

Date Received: 01/26/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			100.37 g	2000 mL	236097	02/05/18 16:00	JPM	TAL PIT
SPLP East	Analysis	EPA 9050A		1			236316	02/07/18 10:48	KXW	TAL PIT
Instrument ID: NOEQUIP										

Client Sample ID: HB17-08

Lab Sample ID: 180-74488-8

Date Collected: 01/25/18 13:00

Matrix: Solid

Date Received: 01/26/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			100.33 g	2000 mL	236097	02/05/18 16:00	JPM	TAL PIT
SPLP East	Analysis	EPA 9050A		1			236316	02/07/18 10:48	KXW	TAL PIT
Instrument ID: NOEQUIP										

Client Sample ID: STEP 4 MIX-1

Lab Sample ID: 180-74488-9

Date Collected: 01/25/18 13:00

Matrix: Solid

Date Received: 01/26/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			100.29 g	2000 mL	236097	02/05/18 16:00	JPM	TAL PIT
SPLP East	Analysis	EPA 9050A		1			236316	02/07/18 10:48	KXW	TAL PIT
Instrument ID: NOEQUIP										

Client Sample ID: STEP 4 MIX-2

Lab Sample ID: 180-74488-10

Date Collected: 01/25/18 13:00

Matrix: Solid

Date Received: 01/26/18 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
SPLP East	Leach	1312			100.48 g	2000 mL	236097	02/05/18 16:00	JPM	TAL PIT
SPLP East	Analysis	EPA 9050A		1			236316	02/07/18 10:48	KXW	TAL PIT
Instrument ID: NOEQUIP										

Laboratory References:

TAL PIT = TestAmerica Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

TestAmerica Pittsburgh

Lab Chronicle

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 180-74488-1

Analyst References:

Lab: TAL PIT

Batch Type: Leach
JPM = Jeremy Merriman

Batch Type: Analysis
KXW = Kaitlyn White

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Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 180-74488-1

Client Sample ID: HB17-01
Date Collected: 01/25/18 13:00
Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-1
Matrix: Solid

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	210	B	1.0	1.0	umhos/cm			02/07/18 10:48	1

Client Sample ID: HB17-02
Date Collected: 01/25/18 13:00
Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-2
Matrix: Solid

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	230	B	1.0	1.0	umhos/cm			02/07/18 10:48	1

Client Sample ID: HB17-03
Date Collected: 01/25/18 13:00
Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-3
Matrix: Solid

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	190	B	1.0	1.0	umhos/cm			02/07/18 10:48	1

Client Sample ID: HB17-04
Date Collected: 01/25/18 13:00
Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-4
Matrix: Solid

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	240	B	1.0	1.0	umhos/cm			02/07/18 10:48	1

Client Sample ID: HB17-05
Date Collected: 01/25/18 13:00
Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-5
Matrix: Solid

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	210	B	1.0	1.0	umhos/cm			02/07/18 10:48	1

Client Sample ID: HB17-06
Date Collected: 01/25/18 13:00
Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-6
Matrix: Solid

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	190	B	1.0	1.0	umhos/cm			02/07/18 10:48	1

Client Sample ID: HB17-07
Date Collected: 01/25/18 13:00
Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-7
Matrix: Solid

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	140	B	1.0	1.0	umhos/cm			02/07/18 10:48	1

TestAmerica Pittsburgh

Client Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 180-74488-1

Client Sample ID: HB17-08

Date Collected: 01/25/18 13:00

Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-8

Matrix: Solid

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	300	B	1.0	1.0	umhos/cm			02/07/18 10:48	1

Client Sample ID: STEP 4 MIX-1

Date Collected: 01/25/18 13:00

Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-9

Matrix: Solid

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	1600	B	1.0	1.0	umhos/cm			02/07/18 10:48	1

Client Sample ID: STEP 4 MIX-2

Date Collected: 01/25/18 13:00

Date Received: 01/26/18 09:00

Lab Sample ID: 180-74488-10

Matrix: Solid

General Chemistry - SPLP East

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	540	B	1.0	1.0	umhos/cm			02/07/18 10:48	1

QC Sample Results

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 180-74488-1

Method: EPA 9050A - Specific Conductance

Lab Sample ID: MB 180-236316/2
Matrix: Solid
Analysis Batch: 236316

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	<1.0		1.0	1.0	umhos/cm			02/07/18 10:48	1

Lab Sample ID: LCS 180-236316/1
Matrix: Solid
Analysis Batch: 236316

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	84.0	87.1		umhos/cm		104	90 - 110

Lab Sample ID: LB 180-236097/1-A
Matrix: Solid
Analysis Batch: 236316

Client Sample ID: Method Blank
Prep Type: SPLP East

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	21.9		1.0	1.0	umhos/cm			02/07/18 10:48	1

Lab Sample ID: 180-74488-1 DU
Matrix: Solid
Analysis Batch: 236316

Client Sample ID: HB17-01
Prep Type: SPLP East

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	210	B	207		umhos/cm		0.9	20

Lab Sample ID: 180-74488-10 DU
Matrix: Solid
Analysis Batch: 236316

Client Sample ID: STEP 4 MIX-2
Prep Type: SPLP East

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Specific Conductance	540	B	540		umhos/cm		0.06	20

QC Association Summary

Client: ARCADIS U.S. Inc
Project/Site: Howard's Bay

TestAmerica Job ID: 180-74488-1

General Chemistry

Leach Batch: 236097

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-74488-1	HB17-01	SPLP East	Solid	1312	
180-74488-2	HB17-02	SPLP East	Solid	1312	
180-74488-3	HB17-03	SPLP East	Solid	1312	
180-74488-4	HB17-04	SPLP East	Solid	1312	
180-74488-5	HB17-05	SPLP East	Solid	1312	
180-74488-6	HB17-06	SPLP East	Solid	1312	
180-74488-7	HB17-07	SPLP East	Solid	1312	
180-74488-8	HB17-08	SPLP East	Solid	1312	
180-74488-9	STEP 4 MIX-1	SPLP East	Solid	1312	
180-74488-10	STEP 4 MIX-2	SPLP East	Solid	1312	
LB 180-236097/1-A	Method Blank	SPLP East	Solid	1312	
180-74488-1 DU	HB17-01	SPLP East	Solid	1312	
180-74488-10 DU	STEP 4 MIX-2	SPLP East	Solid	1312	

Analysis Batch: 236316

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-74488-1	HB17-01	SPLP East	Solid	EPA 9050A	236097
180-74488-2	HB17-02	SPLP East	Solid	EPA 9050A	236097
180-74488-3	HB17-03	SPLP East	Solid	EPA 9050A	236097
180-74488-4	HB17-04	SPLP East	Solid	EPA 9050A	236097
180-74488-5	HB17-05	SPLP East	Solid	EPA 9050A	236097
180-74488-6	HB17-06	SPLP East	Solid	EPA 9050A	236097
180-74488-7	HB17-07	SPLP East	Solid	EPA 9050A	236097
180-74488-8	HB17-08	SPLP East	Solid	EPA 9050A	236097
180-74488-9	STEP 4 MIX-1	SPLP East	Solid	EPA 9050A	236097
180-74488-10	STEP 4 MIX-2	SPLP East	Solid	EPA 9050A	236097
LB 180-236097/1-A	Method Blank	SPLP East	Solid	EPA 9050A	236097
MB 180-236316/2	Method Blank	Total/NA	Solid	EPA 9050A	
LCS 180-236316/1	Lab Control Sample	Total/NA	Solid	EPA 9050A	
180-74488-1 DU	HB17-01	SPLP East	Solid	EPA 9050A	236097
180-74488-10 DU	STEP 4 MIX-2	SPLP East	Solid	EPA 9050A	236097



CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

ID#: _____

Lab Work Order # _____

Page 1 of 1

Contact & Company Name Dave Liles / Andy Brummett		Telephone 919-328-5597
Address Durham NC 27713		Fax 919-328-5597
City	State	Zip
Durham	NC	27713
Project Name/Location (City, State) Howard's Bay		
Sampler's Printed Name Andy Brummett		
E-mail Address david.liles@arcadis.com		
Project # 16135001.0000.00013		
Sampler's Signature <i>[Signature]</i>		

Sample ID	Collection Date	Time	Type (v)		Matrix	REMARKS
			Comp	Grab		
HB17-01	1/26/18	1500			SE	Standard TAX  180-74488 Chain of Custody
HB17-02						
HB17-03						
HB17-04						
HB17-05						
HB17-06						
HB17-07						
HB17-08						
Step 4 Mix-1						
Step 4 Mix-2						

Special Instructions/Comments: Special QA/QC Instructions (v):

* Please perform SLP on each sample then specific conductance on the SLP leachate. Please coordinate with Leslie Howell of Test America North Carolina

Laboratory Information and Receipt		Relinquished By		Received By		Relinquished By	
Lab Name	Cooler Custody Seal (v)	Printed Name	Signature	Printed Name	Signature	Printed Name	Signature
	<input type="checkbox"/> Intact <input type="checkbox"/> Not Intact	Andy Brummett	<i>[Signature]</i>	Thomas Say	<i>[Signature]</i>		
Specify Turnaround Requirements	Sample Receipt	Firm	Firm/Counter				
Shipping Tracking #	Condition/Cooler Temp	Arcadis	TA PIT-				
		1/26/18	1500	1/26/18	900		

20730826 CoC AR Form 08.27.2015

Distribution: WHITE - Laboratory returns with results YELLOW - Lab copy PINK - Retained by Arcadis



Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Job Number: 180-74488-1

Login Number: 74488
List Number: 1
Creator: Say, Thomas C

List Source: TestAmerica Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



SECTION 02 61 14

TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS
02/10

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)

IATA DGR (2017) Dangerous Goods Regulations

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

49 CFR 172 Hazardous Materials Table, Special Provisions,
Hazardous Materials Communications, Emergency
Response Information, and Training Requirements

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Waste Transportation and Disposal Plan; G-AOF

SD-06 Test Reports

Recordkeeping; G-AOF

Spill Response

Exception Report; G-AOF

SD-07 Certificates

Transportation and Disposal Coordinator; G-AOF

Training; G-AOF

Certificates of Disposal; G-AOF

1.3 QUALITY ASSURANCE

1.3.1 Transportation and Disposal Coordinator

Designate, by position and title, one person to act as the Transportation and Disposal Coordinator (TDC) for this contract. The TDC shall serve as the single point of contact for all environmental regulatory matters and shall have overall responsibility for total environmental compliance at the site including, but not limited to, accurate identification and classification of remediation waste; determination of proper shipping names; identification of marking, labeling, packaging and placarding requirements; completion of waste profiles, bill of ladings, exception and discrepancy reports; and all other environmental documentation. The TDC shall have, at a minimum, one year of specialized experience in the management and transportation of remediation wastes and have been Department of Transportation certified under 49 CFR 172, Subpart H. This can be a collateral position if experience and training requirements are met for both positions and workload allows.

1.3.2 Training

The Contractor's employees shall be trained, tested, and certified to safely and effectively carry out their assigned duties in accordance with Section 01 35 29.13 HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES FOR CONTAMINATED SITES and Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. The Contractor's employees transporting materials or preparing materials for transportation, including samples, shall be trained, tested, and certified in accordance with 49 CFR 172, Subpart H, including security awareness and any applicable security plans. Contractor employees making determinations that shipments do not constitute DOT regulated hazardous materials shall also be trained, tested, and certified in accordance with 49 CFR 172, Subpart H.

1.3.3 Laws and Regulations Requirements

Work shall meet or exceed the minimum requirements established by Federal, state, and local laws and regulations which are applicable. These requirements are amended frequently and compliance with amendments is required as they become effective. In the event that compliance exceeds the scope of work or conflicts with specific requirements of the contract, notify the Contracting Officer immediately.

PART 2 PRODUCTS

2.1 MATERIALS

Provide all the materials required for the packaging, labeling, marking, placarding and transportation of remediation wastes in conformance with Department of Transportation standards and IATA DGR. Details in this specification shall not be construed as establishing the limits of the Contractor's responsibility.

2.1.1 Containers

All containers used for staging and transporting waste material shall be inspected upon arrival to ensure they are in good condition (i.e., clean, no damage). Containers used for offsite waste transport shall be watertight and sift-proof; equipped with functioning tailgate locks and non-mesh (solid), waterproof tarpaulins; suitable for truck service; and meet local, state, and federal regulations.

2.1.2 Markings

Provide markings for each waste package, freight container, and transport vehicle consistent with the requirements of 49 CFR 172, Subpart D. Markings shall be capable of withstanding, without deterioration or substantial color change, a 180 day exposure to conditions reasonably expected to be encountered during container storage and transportation.

2.1.2 Labeling

Provide primary and subsidiary labels for materials/wastes consistent with federal, state, and local regulations. Labels shall be durable and weather resistant and capable of withstanding, without deterioration or substantial color change, a 180 day exposure to conditions reasonably expected to be encountered during container storage and transportation.

2.1.3 Placards

For each offsite shipment of material/waste, provide primary and subsidiary placards consistent with the requirements of 49 CFR 172, Subpart F. Placards shall be provided for each side and each end of bulk packaging, freight containers, transport vehicles, and rail cars requiring such placarding. Placards may be plastic, metal, or other material capable of withstanding, without deterioration, a 30 day exposure to open weather conditions and shall meet design requirements specified in 49 CFR 172, Subpart F.

2.1.4 Spill Response Materials

Provide spill response materials including, but not limited to, containers, adsorbent, shovels, and personal protective equipment. Spill response materials shall be available at all times in which materials/wastes are being handled or transported. Spill response materials shall be compatible with the type of material being handled.

2.2 EQUIPMENT AND TOOLS

Provide miscellaneous equipment and tools necessary to handle remediation wastes in a safe and environmentally sound manner.

PART 3 EXECUTION

3.1 WASTE TRANSPORTATION AND DISPOSAL PLAN

Prepare a plan detailing the manner in which wastes will be transported offsite and describing the types and volumes of wastes anticipated to be managed as well as the management practices to be utilized. The plan shall identify the methods to ensure wastes meet shipment requirements; identify method to be used to ensure accurate weights of shipments; identify waste minimization methods; identify haul routes for treated sediment transported to Wisconsin Point Landfill; propose facilities and haul routes to be utilized for treatment, storage, and/or disposal of material not suitable for placement at Wisconsin Point landfill; identify areas onsite where wastes are to be loaded; and identify whether transfer facilities are to be utilized, and if so, how the wastes will be tracked to ultimate disposal. Submit the plan prior to start of work. For treatment, storage, and/or disposal facilities proposed for off-site disposal of material not suitable for placement at Wisconsin Point landfill provide letter(s) of acceptance from

the facility covering the materials being disposed and a copy of the facilities' state and local Solid Waste Management Permit. Written documentation of waste transported offsite shall be submitted on a monthly basis.

3.2 ONSITE WASTE MANAGEMENT

Contractors are prohibited by 10 U.S.C. 2692 from storing Contractor owned waste onsite for any length of time. The Contractor is responsible for ensuring compliance with all Federal, state, and local waste laws and regulations and shall verify those requirements when preparing reports, waste shipment records, waste manifests, or other documents. Only use containers in good condition and compatible with the waste to be stored. Ensure containers are closed except when adding or removing waste, and immediately mark all containers with the contents of the container and other information required by any applicable federal, state, or local law or regulation as soon as the waste is containerized. An additional marking shall be placed on containers of "unknowns" designating the date sampled, and the suspected hazard. Inspect containers for signs of deterioration and for responding to any spills or leaks. Inspect all waste staging areas at least weekly and provide written documentation of the inspection. Include date and time of inspection, name of individual conducting the inspection, problems noted, and corrective actions taken on the inspection logs.

3.3 OFFSITE WASTE MANAGEMENT

Submit Notices of Non-Compliance and Notices of Violation by a Federal, state, or local regulatory agency issued to the Contractor in relation to any work performed under this contract. Immediately provide copies of such notices to the Contracting Officer. Also furnish all relevant documents regarding the incident and any information requested by the Contracting Officer, and coordinate its response to the notice with the Contracting Officer or the designated representative prior to submission to the notifying authority. Also furnish a copy to the Contracting Officer of all documents submitted to the regulatory authority, including the final reply to the notice, and all other materials, until the matter is resolved.

3.3.1 Treatment, Storage, and/or Disposal Facility and Transporter

Provide the Contracting Officer with EPA ID numbers, names, locations, and telephone numbers of transporters and TSD facilities. This information shall be contained in the Waste Transportation and Disposal Plan and shall be approved by the Contracting Officer prior to waste placement or disposal off-site.

3.3.2 Transportation

3.3.2.1 General

Offsite transportation shall occur between the hours of 7 am and 9 pm, Monday through Friday from Memorial Day weekend through Labor Day weekend. Prior to Memorial Day weekend and following Labor Day weekend, offsite transportation to Wisconsin Point Landfill can occur from 7 am to 9 pm Monday through Sunday. Offsite truck traffic outside these hours are strictly prohibited. Contractor shall control traffic in accordance with its approved Traffic Control Plan prepared in accordance with SECTION 01 35 13.10 SPECIAL PROJECT PROCEDURES.

3.3.2.2 Covered Loads

All trucks or open-top containers used for offsite transport shall be covered with a soft pull-tarp cover mounted on the truck or container. The tarp shall extend over the truck or container and shall be secured in accordance with United State Department of Transportation standards.

3.3.2.2 Transportation Documents

Prepare waste manifests or bills of lading for each shipment of remediation waste shipped over public roadways. Manifests and bills of lading shall comply with applicable state or local law or regulation. Submit manifests and waste profiles to Contracting Officer for review and approval. Submit notifications with the manifest to the Contracting Officer for review and approval.

3.3.3 Dredged Sediments Placement at Wisconsin Point Landfill

Dredged sediments shall be treated to meet the minimum requirement of this section and Section 02 66 00 SELECT FILL AND TOPSOIL FOR LANDFILL COVER. Dredged sediments shall be transported to the Wisconsin Point Landfill property in accordance with this Section and placed in accordance with SECTION 31 00 00 EARTHWORK to the lines and grades shown in the Drawings.

3.3.4 Remediation Wastes Disposal at TSD Facility

Remediation wastes, including dredged sediment with concentrations in excess of the Wisconsin Point Landfill placement criteria and all debris, shall be transported to an approved disposal or recycling facility permitted to accept such wastes. The Wisconsin Point Landfill placement criteria is provided in the WDNR memorandum dated April 19, 2017 (subject line: Revisions to September 27, 2016 Memorandum with Subject Line, "Site-Specific Residual Contamination Levels for Dredge Material Proposed for Placement at the Closed Wisconsin Point Landfill in Superior, Wisconsin") presented in Appendix B of the Design Document Report, GLLA Sediment Cleanup in Howards Bay, Superior, Wisconsin. The placement criteria are listed on page 3 and Table 1 ("Table 1 (April 18, 2017 Revision): Recommended Wisconsin Point Landfill Placement Criteria in mg/kg") of the April 19, 2017 WDNR memorandum. The pre-approved offsite disposal location is Vonco Landfill in Duluth, Minnesota.

Priority shall be given to recycling debris to the extent practicable in accordance with SECTION 01 57 19 TEMPORARY ENVIRONMENTAL CONTROL. Offsite treatment, storage, and/or disposal facilities with significant violations or compliance problems (such as facilities known to be releasing hazardous constituents into ground water, surface water, soil, or air) shall not be used. Ensure wastes are treated to meet the disposal facility's requirements. Propose disposal facilities via submission of the Waste Transportation and Disposal Plan, subject to the approval of the Contracting Officer. Submit Certificates of Disposal to document the ultimate disposal of the waste. Receipt of these certificates will be required for final payment.

3.4 OBTAINING EPA ID NUMBERS

Complete EPA Form 8700-12, Notification of Hazardous Waste Activity, and submit to the Contracting Officer for review and approval. Allow a minimum

of 30 days for processing the application and assigning the EPA ID number. Shipment shall be made not earlier than one week after receipt of the EPA ID number.

3.5 WASTE MINIMIZATION

Minimize the generation of waste to the maximum extent practicable and take all necessary precautions to avoid mixing clean and contaminated wastes.

3.6 RECORDKEEPING

Maintain adequate records to support information provided to the Contracting Officer regarding exception reports, annual reports, and biennial reports. Maintain bill of ladings for a minimum of 375 days from the date of shipment or any longer period required by any applicable law or regulation or any other provision of this contract. Submit information necessary to file state annual or EPA biennial reports for all waste transported, treated, stored, or disposed of under this contract. Do not forward these data directly to the regulatory agency but to the Contracting Officer at the specified time. The submittal shall contain all the information necessary for filing of the formal reports in the form and format required by the governing Federal or state regulatory agency. A cover letter shall accompany the data to include the contract number, Contractor name, and project location. In the event that a manifest copy documenting receipt of waste at a permitted disposal facility is not received within 35 days of shipment initiation, prepare and submit an exception report to the Contracting Officer within 37 days of shipment initiation.

3.7 SPILL RESPONSE

In the event of a spill or release of a contaminated material, notify the Contracting Officer immediately. Any direction from the Contracting Officer concerning a spill or release shall not be considered a change under the contract. If the spill exceeds a reporting threshold, follow the pre-established procedures for immediate reporting to the Contracting Officer. Comply with all applicable requirements of Federal, state, or local laws or regulations regarding any spill incident.

-- End of Section --

SECTION 02 66 00

SELECT FILL AND TOPSOIL FOR LANDFILL COVER
02/10

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C136/C136M	(2014) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D1140	(2014) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
ASTM D2487	(2011) Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D2974	(2014) Moisture, Ash, and Organic Matter of Peat and Other Organic Soils
ASTM D4318	(2010; E 2014) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4972	(2013) pH of Soils

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Wisconsin Point Landfill Material Placement Plan; G-AOF

SD-06 Test Reports

Material Tests for Topsoil

1.3 DEFINITIONS

1.3.1 Subsurface Cover

Subsurface Cover is sediment dredged from Dredge Management Units (DMUs) identified in the Drawings for use in subsurface cover only and dewatered in accordance with Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED

MATERIAL. Subsurface Cover shall only be placed at depths greater than two feet from final grade at Wisconsin Point Landfill.

1.3.2 Surface Cover

Surface Cover is dredged sediment that meet the "Placement Criteria" listed on page 3 and Table 1 ("Table 1 (April 18, 2017 Revision): Recommended Wisconsin Point Landfill Placement Criteria in mg/kg") of the April 19, 2017 WDNR memorandum presented in Appendix B of the Design Document Report, GLLA Sediment Cleanup in Howards Bay, Superior, Wisconsin. Surface Cover sediment shall be dredged from DMUs identified in the Drawings for use in surface cover. Surface Cover sediment shall be dewatered in accordance with Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Surface Cover shall be placed above Subsurface Cover and a minimum 12 inches below final grade at Wisconsin Point Landfill.

PART 2 PRODUCTS

2.1 IMPORTED FILL

Imported fill shall be submitted for analytical testing in accordance with Section 31 00 00 EARTHWORK. Materials imported for placement at the Wisconsin Point Landfill shall meet the criteria for "Placement Criteria" listed on page 3 and Table 1 ("Table 1 (April 18, 2017 Revision): Recommended Wisconsin Point Landfill Placement Criteria in mg/kg") of the April 19, 2017 WDNR memorandum in Appendix B of the Design Document Report, GLLA Sediment Cleanup in Howards Bay, Superior, Wisconsin.

2.1.1 Erie Pier Borrow Material

Erie Pier Borrow Material is material obtained from identified borrow areas at Erie Pier for placement at Wisconsin Point Landfill. Erie Pier Borrow Material shall be free of: rock and gravel larger than three inches in any dimension, debris, waste, frozen materials, and other deleterious matter. Erie Pier Borrow Material shall be amended with high potassium fertilizer at a rate of 1.3 pounds per 100 square feet (0.7 pound per cubic yard) based on results of testing performed by WDNR reported in the August 31, 2018 memorandum entitled "Sampling and Analysis of Fine Material Stockpiles at Erie Pier, Duluth MN". Erie Pier Borrow Material shall be placed above the surface cover sediments and below topsoil as shown on the Drawings.

2.1.2 Topsoil

Material suitable for topsoil obtained from offsite areas is defined as: Natural, friable soil representative of productive, well-drained soils in the area, free of subsoil, stumps, rocks larger than one-inch diameter, brush, weeds, toxic substances, and other material detrimental to plant growth. Imported topsoil shall have a pH between 5.5 and 8.0 as measured by ASTM D4972 and an organic content of 3 to 20 percent as measured by ASTM D2974.

2.2 EQUIPMENT

Equipment used to place the materials at Wisconsin Point Landfill shall be as described in the approved Wisconsin Point Landfill Material Placement Plan, including ground pressures. Equipment shall not accelerate or brake suddenly, turn sharply, or be operated at speeds exceeding 5.0 miles per hour.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 General Requirements

Remove and replace unsatisfactory material, as directed by the Contracting Officer, in areas to receive fill. Do not place material on surfaces that are muddy, frozen, or contain frost.

3.1.2 Erie Pier Borrow Source

Contractor shall provide all labor, equipment, and incidentals required to remove, transport, and amend borrow material from Erie Pier for use at Wisconsin Point Landfill. Contractor shall complete borrow operations with minimal disturbance to non-borrow areas and shall not create areas with potential to pond. Erie Pier Borrow Material shall be amended with high potassium fertilizer at a rate of 1.3 pounds per 100 square feet (0.7 pound per cubic yard) based on results of testing performed by WDNR reported in the August 31, 2018 memorandum entitled "Sampling and Analysis of Fine Material Stockpiles at Erie Pier, Duluth MN". Upon completion of the work, borrow areas shall be conditioned to drain readily, and be left in a satisfactory condition as determined by the Government

3.1.3 Topsoil Stripping

If elected by Contractor, topsoil stripping may be performed if documented in the Wisconsin Point Landfill Material Placement Plan, approved by the Government, and performed in accordance with this paragraph. Contractor shall minimize area of exposed bare ground to the extent possible. If performed, strip topsoil to a depth of 4 inches and transport to stockpiles convenient to areas that are to receive application of the topsoil later. Keep topsoil separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 2 inches in diameter, and other materials that would interfere with planting and maintenance operations. Install and maintain erosion controls around topsoil stockpiles and exposed bare ground. Stripped topsoil shall be tested as required Paragraph CONSTRUCTION TESTS of this Section to document material meets the requirements of the Contract. Stripped topsoil that does not meet the requirements of the Contract shall be returned to the approximate location of removal and placed below the Topsoil material. Any surplus of topsoil from stripping operations not returned to subgrade shall be remove from the site and disposed at a permitted disposal facility at the Contractor's cost.

3.1.4 Surface Preparation

Prepare the surface of area to receive fill at Wisconsin Point Landfill in accordance with Section 31 00 00 EARTHWORK. Subgrade within the placement area shall be compacted by tracking with suitably sized dozer equipment. It is anticipated that a minimum of up to two dozer track passes will be required for compaction. The need for further compaction will be determined by the Contracting Officer or their Representative following initial compaction. Generally, equipment used for compaction shall be the largest type in consideration of space limitations of the work areas and the need to protect adjacent facilities and underlying materials. Surface preparation shall be

performed in phases and limited in area that filled to final grade and seeded in a timely manner.

3.2 INSTALLATION

3.2.1 Fill Placement

Subsurface Cover, Surface Cover, and Erie Pier Borrow Material placed at Wisconsin Point Landfill shall be placed and compacted in accordance with Section 31 00 00 EARTHWORK. The order of material placement shall be (from bottom up): Subsurface Cover, Surface Cover, and Erie Pier Borrow Material. If more dredged material (Subsurface Cover, Surface Cover) is produced than can be placed at Wisconsin Point Landfill, dispose of excess in accordance with Section 02 61 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS. Contractor shall perform fill placement from the bottom of slope upward and shall not exceed the maximum grade shown on the Drawings (10%). Contractor shall install and maintain erosion controls during fill placement in accordance with Section 31 32 11 SOIL SURFACE EROSION CONTROL. Once subgrade is achieved for placement of imported fill materials, Contractor shall complete imported fill material placement as soon as practicable.

3.2.2 Topsoil Placement

Imported topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to proper grading as determined by the Contracting Officer. Imported topsoil shall be placed in one lift and shall be evenly spread to a final thickness of 6 inches. On slopes, the topsoil lift shall be placed from the bottom of the slope upward. Once topsoil is place, seeding and mulching shall be performed within 14 days of achieving final grade in accordance with Section 31 32 11 SOIL SURFACE EROSION CONTROL.

3.3 CONSTRUCTION TOLERANCES

Final grades at Wisconsin Point Landfill shall not exceed those shown on the Drawings. Finished surfaces shall be uniformly graded with a minimum slope of 3% and maximum slope of 10%. Finished surface shall be free from depressions, mounds, or windrows. Rigid grade stakes shall not be driven into the subgrade to control placement.

3.4 CONSTRUCTION TESTS

No topsoil shall be placed until the Material Tests for Topsoil and analytical testing is approved. Provide analytical testing results in accordance with Section 31 00 00 EARTHWORK. Provide physical property testing results in accordance with the following.

3.4.1 Material Tests for Topsoil

Prior to topsoil placement, submit one representative sample per topsoil source to an agricultural laboratory for nutrient analyses and recommendations for soil amendment.

During construction, representative samples shall be taken for testing topsoil at the frequencies listed in Table 2 prior to placement. Test

results must comply with the requirements listed in Part 2 Products or the material will be rejected for use. Submit test results as specified.

TABLE 2 TOPSOIL PROPERTY TESTING		
Property	Frequency	Test Method
Topsoil		
Grain Size Analysis for Maximum Particle Size	2,000 cubic yards	ASTM C136/C136M and ASTM D1140
pH	2,000 cubic yards	ASTM D4972
Organic content	2,000 cubic yards	ASTM D2974

3.5 PROTECTION

3.5.1 Monitoring Wells

Existing monitoring wells at Wisconsin Point Landfill shall be protected in accordance with SECTION 01 35 13.10 SPECIAL PROJECT PROCEDURES. Monitoring wells within sediment consolidation areas shall be extended in accordance with the Drawings.

3.5.2 Damage

Erosion rills or other damage that occurs shall be repaired and grades re-established. Repairs to the topsoil layer shall be documented including location and volume of soil affected, corrective action taken, and results of retests.

3.5.3 Stockpiles

Storage or stockpiling of material on the completed surface of the Erie Pier Borrow Materials or Topsoil layers will not be permitted.

3.5.4 Existing Cover Soils

Vary access routes as necessary to avoid rutting of existing cover soils. If surface conditions require (e.g., due to the occurrence of soft and/or rutting soils), Erie Pier Borrow material may be used to enhance accessibility where necessary to maintain a stable working surface. Contractor will be responsible for assessing and determining need for surface enhancements necessary to facilitate filling operations.

3.6 EXAMINATION

Contractor shall notify the Contracting Officer when placement of each of the following layers is completed within an area:

- Dredged Sediments (i.e., top of surface cover is achieved).
- Erie Pier Material
- Topsoil

As soon as practicable after the completion of placement of the above materials within the entire work or any section thereof as in the opinion of the Contracting Officer will not be subject to damage by further operations under the contract, such work will be thoroughly examined at the cost and expense of the Government by topographic survey. Should any material placed not meet the requirements of this section, the Contractor is required to regrade the material at no additional cost to the Government. The Contractor

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or its authorized representative will be notified when survey are to be made, and will be permitted to accompany the survey party. When the area is found to be in a satisfactory condition, it will be accepted finally. Should more than two (2) survey operations by the Government over an area be necessary by reason of re-work of material previously identified during a prior survey, the cost of such third and any subsequent survey operations will be charged against the Contractor at the rate of \$3,500 per calendar day in which the Government plant is engaged in survey and/or is enroute to or from the site or held at or near the said site for such operations.

-- End of Section --

SECTION 12 93 00

SITE FURNISHINGS
08/17

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 303 (2016) Code of Standard Practice for Steel Buildings and Bridges

AISC 360 (2016) Specification for Structural Steel Buildings

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B18.2.1 (2012; Errata 2013) Square and Hex Bolts and Screws (Inch Series)

ASME B18.2.2 (2015) Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series)

ASME B18.6.2 (1998; R 2010) Slotted Head Cap Screws, Square Head Set Screws, and Slotted Headless Set Screws: Inch Series

ASME B18.6.3 (2013; R 2017) Machine Screws, Tapping Screws, and Machine Drive Screws (Inch Series)

ASME B18.21.1 (2009; R 2016) Washers: Helical Spring-Lock, Tooth Lock, and Plain Washers (Inch Series)

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ASSP A10.3 (2013) Safety Requirements for Powder-Actuated Fastening Systems American National Standard for Construction and Demolition Operations

ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M (2014) Standard Specification for Carbon Structural Steel

ASTM A47/A47M (1999; R 2018; E 2018) Standard Specification for Ferritic Malleable Iron Castings

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ASTM A53/A53M	(2018) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A307	(2014; E 2017) Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
ASTM A500/A500M	(2018) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A501/A501M	(2014) Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
ASTM A653/A653M	(2019) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A1008/A1008M	(2016) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
ASTM D3451	(2006; R 2017) Standard Guide for Testing Coating Powders and Powder Coatings
ASTM E488/E488M	(2015) Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements
SOCIETY OF AUTOMOTIVE ENGINEERS INTERNATIONAL (SAE)	
SAE AMS-STD-595A	(2017) Colors used in Government Procurement
U.S. GENERAL SERVICES ADMINISTRATION (GSA)	
CID A-A-1925	(Rev A; Notice 3) Shield Expansion (Nail Anchors)

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Benches and Chairs; G, AOF

Shelters; G, AOF

Assembly Instruction Drawings

SD-03 Product Data

Benches and Chairs

Shelters

SD-04 Samples

Finish; G, AOF

SD-06 Test Reports

Testing

SD-07 Certificates

Primer Certificate

Powder Coatings Certificate

1.3 QUALITY ASSURANCE

1.3.1 Fabrication Drawings

Submit fabrication drawings showing layout(s), connections to structural system, and anchoring details as specified in AISC 303.

1.3.2 Installation Drawings

Submit templates, erection and installation drawings indicating thickness, type, grade, class of metal, and dimensions. Show construction details, reinforcement, anchorage, and installation.

1.3.3 Assembly Instruction Drawings

Submit assembly instruction drawings showing layout(s), connections, bolting and anchoring details in accordance with manufacturer's standards. Submit drawings showing scaled details of proposed site furnishings, elevations for each type of site furnishing; dimensions, details, and methods of mounting or anchoring; shape and thickness of materials; and details of construction.

1.3.4 Powder Coatings Certificate

Submit a certificate from the manufacturer stating that the powder coat conforms to ASTM D3451.

1.4 DELIVERY, STORAGE, AND HANDLING

Ship items knocked-down (KD) ready for site assembly. Packaged components must be complete including all accessories and hardware. Materials must be delivered, handled, and stored in accordance with the manufacturer's recommendations. Site furnishings must be inspected upon arrival at the job site for conformity to specifications and quality in accordance with paragraph MATERIALS. Protect from corrosion, staining, and other types of damage. Store items in designated area free from contact with soil and weather. Remove and replace damaged items with new items.

PART 2 PRODUCTS

2.1 MATERIALS

Furnish materials which are the standard products of a manufacturer regularly engaged in the manufacture of such products. The materials furnished must be of a type with proven satisfactory usage for at least 2 years. Materials must have 25 year manufacturer's warranty against failure and defects.

2.1.1 Metals

Furnish metal components with factory drilled holes and free of excess weld and spatter. Metal components with holes that will not be filled by hardware or hidden by other components will be rejected. Structural steel products must conform to ASTM A36/A36M, ASTM A500/A500M and ASTM A501/A501M. Steel plates, shapes and bars must conform to ASTM A36/A36M. Sheet steel must be cold rolled and conform to ASTM A1008/A1008M, Commercial Steel (CS), exposed. Metallic coated sheet steel must conform to ASTM A653/A653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.1.2 Structural Tubing

Structural tubing must conform to ASTM A500/A500M

2.1.3 Steel Pipe and Fittings

Steel pipe must conform to ASTM A53/A53M, Type E or S, Grade B; standard malleable iron fittings must conform to ASTM A47/A47M.

2.1.4 Anchors and Hardware

Furnish anchors for fastening site furnishings securely in place and in accordance with approved manufacturer's instructions. Anchoring devices that may be used, when no anchors are otherwise specified or indicated, include anchor bolts, slotted inserts, expansion shields for concrete and machine carriage bolts for steel and aluminum. Anchor bolts must conform to ASTM A307. Hardware must be stainless steel and compatible with the material to which applied. All exposed hardware must match in color and finish. Mounting hardware must be concealed, recessed, and plugged.

2.1.4.1 Threaded Inserts and Expansion Anchors

Furnish inserts in accordance with manufacturer's instructions for mounting in concrete with f'c of 3,000 psi, as tested in accordance with ASTM E488/E488M. Expansion shields must conform to CID A-A-1925, group II, type 4, class 1.

2.1.4.2 Bolts, Nuts, Studs and Rivets

ASME B18.2.2 or ASTM A307.

2.1.4.3 Power Driven Fasteners

Follow safety provisions of ASSP A10.3.

2.1.4.4 Screws

ASME B18.2.1, ASME B18.6.2, and ASME B18.6.3.

2.1.4.5 Washers

Furnish plain washers to conform to ASME B18.21.1. Furnish beveled washers for American Standard beams and channels, square or rectangular, tapered in thickness, and smooth. Furnish lock washers to conform to ASME B18.21.1.

2.2 COATINGS AND FINISHES

Coatings must have 10 year manufacturer's warranty against corrosion.

2.2.1 Powder Coating

Unless otherwise specified, powder coated surfaces must receive electrostatic zinc coating before powder coating. Powder coating must be thermoplastic type, electrostatically applied and oven cured. Powder coating must be resistant to ultraviolet (UV) light and rated for year-round exposure to the elements.

2.2.2 Finish

Finish must be as specified by the manufacturer unless otherwise indicated. Exposed surfaces and edges must be rounded, polished, or sanded. Finish must be non-toxic, non-glare, and resistant to corrosion. Exposed surfaces must be smooth and splinter-free. Submit two sets of color data for each furnishing displaying manufacturer's color selections and finishes, and identifying those colors and finishes proposed for use.

2.2.2.1 Color Schedule

The color schedule covers only the color of materials that are exposed to view in the finished construction. If color is not designated for materials, propose a color for approval.

The following paragraphs list the colors required for factory applied exterior finishes. Colors are specified in accordance with SAE AMS-STD-595A. Equivalent colors from a manufacturer's standard product line may be submitted for approval. Colors as specified are not intended to limit the selection of equal colors from otherwise acceptable manufacturers.

2.2.2.1.1 Powder Coated Metal (PCM)

PCM-1: AMS-STD 33303 Sand; apply to benches, shelter roof panels, shelter ridge cap, and shelter gutter fascia

PCM-2: AMS-STD 30051 Leather Brown; apply to shelter frame, shelter railings, and shelter railing bench seats and backs

2.3 PARK BENCHES

Furnish 4 steel park benches that are one width between 5.0 foot and 6.5 foot. Benches must not have sharp edges or protruding hardware. Benches must be factory powder coated and shipped with hardware for anchoring to concrete slab on grade. Benches must have vertically slatted back rests, slatted

seats, arm rests on each end, and at least 2 legs. Arm rests must extend the full depth of the seat and back rests must extend the full width of the seat.

2.3.1 Accessories

Furnish manufacturer's standard materials and accessories as required for assembly of units and as indicated on the assembly drawings. Furnish unexposed aluminum, stainless steel or powder coated steel plates, angles and supports as required for complete assembly. Separate dissimilar materials to prevent electrolytic action.

2.3.2 Fasteners

Furnish concealed fasteners except where specifically approved; types as specified by manufacturer.

2.3.3 Anchoring Brackets

Furnish powder coated steel anchoring brackets pre-drilled for bolting benches to concrete slab on grade.

2.4 SHELTERS

Furnish a prefabricated steel shelter meeting requirements of AISC 360. Shelter design must conform to all applicable State and Local Building Codes and must meet manufacturer's standards of construction and materials. Shelter systems must be factory powder coated, pre-drilled, and pre-cut, shipped with all hardware and accessories necessary for complete field assembly.

2.4.1 Framing Systems

Framing system; columns, rafters, ridge, purlins and other structural framing members must be steel. Manufacturer must provide shop drawings and calculations prepared by a structural engineer.

2.4.1.1 Steel

Structural steel must conform to ASTM A36/A36M or ASTM A500/A500M, 36,000 psi yield strength and 58,000 psi tensile strength, factory finished with rust inhibited primer and powder coat conforming to ASTM D3451. Framing sizes and configurations must be as required for size of structure indicated meeting manufacturer's standard and applicable building codes.

2.4.2 Roof

Furnish shelter with a six-sided, two-tiered, hip type roof. Roof panels must be manufacturer's standing seam powder coated steel. Materials must be factory finished and shipped with all necessary fasteners and accessories as required for complete site assembly. Furnish powder coated steel or aluminum ridge caps and fascia boards. Fascia boards must be able to support 5 inch aluminum gutters.

2.4.3 Railing

Furnish railings with built in bench seats and backs for 4 bays between structural columns.

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PART 3 EXECUTION

-- End of Section --

SECTION 31 00 00

EARTHWORK
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PART 1 GENERAL

1.1 CRITERIA FOR BIDDING

Base bids on the following criteria:

- a. Surface elevations are as indicated.
- b. Pipes or other artificial obstructions, except those indicated, will not be encountered.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

- | | |
|-----------------|---|
| ASTM C136/C136M | (2014) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates |
| ASTM D1140 | (2014) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve |

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

- | | |
|------------|---|
| EPA SW-846 | (Update V) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods |
|------------|---|

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

- | | |
|--------|---|
| NR 149 | (July 2014) Laboratory Certification and Registration |
| NR 700 | (September 2018) General Requirements |

1.3 DEFINITIONS

1.3.1 Compaction Requirements

Materials shall be compacted as stated below:

- a. Unless specified otherwise on the Drawings or in these specifications, subgrade for the fill materials (i.e., suitable existing overburden material) within the placement area shall be compacted by tracking with suitably sized dozer equipment. It is anticipated that a minimum of up to two dozer track passes will be required for compaction. The need for further compaction will be determined by the Contracting

Officer or their Representative following initial compaction. Generally, equipment used for compaction shall be the largest type in consideration of space limitations of the work areas and the need to protect adjacent facilities and underlying materials.

- b. Proof-rolling shall be performed on completed lifts and deemed acceptable by Contracting Officer or their representative prior to placing subsequent materials over the prepared surface.
- c. Proof-rolling will consist of dozer tracking over completed surfaces and visual observations to determine if the resultant track depression depth is acceptable (i.e., approximately 2-inches or less). Any soft or wet materials that deform more than the acceptable depth shall be removed and replaced with suitable material. Replaced material shall be compacted accordance with this specification.

1.3.2 Hard/Unyielding Materials

Hard/Unyielding materials comprise weathered rock, dense consolidated deposits, or conglomerate materials which are not included in the definition of "rock" with stones greater than 3 inches in any dimension, whichever is smaller. These materials usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

1.3.3 Rock

Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers; also large boulders, buried masonry, or concrete other than pavement exceeding 1/2 cubic yard in volume. Removal of hard material will not be considered rock excavation because of intermittent drilling and blasting that is performed merely to increase production.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-06 Test Reports

Gradation Testing

Analytical Testing

SD-07 Certificates

Location of imported soils and aggregate sources

Qualifications of the testing laboratory

1.5 QUALITY ASSURANCE

1.5.1 Required Data

Submit location of imported soils and aggregate sources in writing. Do not construe Government approval of samples as approval of the source of the samples. Submit required gradation and analytical testing results at least 21 days prior to import of material to the site.

1.5.2 Analytical Testing Laboratories

Propose the analytical laboratories to be used for the samples analyses at least 14 calendar days prior to collecting samples. Perform testing by a DoD ELAP accredited commercial testing laboratory or the Contractor's validated testing facility. Analytical laboratories shall also be accredited through the Wisconsin Department of Natural Resources Laboratory Certification Program for all parameters that have such certifications and meet the criteria outlined in NR 149. Sample analysis shall meet the requirements of NR 700.13. Submit qualifications of the testing laboratory which shall be certified to perform the tests required and achieve the required detection limits. If a proposed analytical laboratory cannot meet specified analytical requirements, select another laboratory at no additional cost to the Government.

PART 2 PRODUCTS

2.1 ANALYTICAL TESTING REQUIREMENTS FOR IMPORTED SOILS

Unless otherwise specified for specific materials, test offsite soils imported to the site for use as backfill or topsoil for the following:

Constituent	Analytical Method
Polycyclic aromatic hydrocarbon (PAHs)	EPA SW-846 Method 8310
Organotins	gas chromatograph/flame photometric detector
Target analyte list (TAL) metals	EPA SW-846 Method 3050/6010 and EPA SW-846 Method 7471
Polychlorinated biphenyls (PCBs)	EPA SW-846 Method 8081
Target compound list (TCL) pesticides	EPA SW-846 Method 8081
Total organic carbon (TOC)	EPA SW-846 Method 9060
Full Toxicity Characteristic Leaching Procedure (TCLP) including ignitability, corrosivity and reactivity	EPA SW-846 Method 1311

Offsite soils shall meet the Site-Specific Residual Contamination Levels (RCLs) and shall pass the TCLP test. Unless otherwise specified, provide analytical testing results from a composite sample of material from the borrow site, with at least one test from each borrow site. Do not bring material onsite until tests have been approved by the Contracting Officer.

2.2 GRADATION TESTING

Determine gradation of fill and backfill material in accordance with ASTM C136/C136M or ASTM D1140 as appropriate. One test per source and material imported unless otherwise specified.

PART 3 EXECUTION

3.1 GENERAL EARTHWORK

3.1.1 Drainage

Provide for the collection and disposal of surface and subsurface water encountered during construction. Completely drain construction site during periods of construction to prevent ponding of water. Throughout construction grade the construction area to provide positive surface water runoff away from the construction activity or provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed.

3.1.2 Utilization of Site Materials

Sediments dewatered in accordance with Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL, shall be placed at Wisconsin Point Landfill in accordance with Section 02 66 00 SELECT FILL AND TOPSOIL FOR LANDFILL COVER. Dewatered sediment not suitable for placement at Wisconsin Point Landfill or in excess of the volume that can be disposed of at Wisconsin Point Landfill shall be disposed of at permitted facilities in accordance with Section 02 61 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS. Do not dispose of any unsuitable or excess dewatered sediment without authorization Use of other site materials is prohibited without prior written approval from Contracting Officer.

3.1.3 Selection of Import Material

Select import material to meet the requirements and conditions of this section. Obtain borrow material from approved sources. Unless otherwise provided in the contract, the Contractor is responsible for obtaining the right to procure material, pay royalties and other charges involved, and bear the expense of developing the sources, including rights-of-way for hauling from the owners. Borrow material from approved sources on Government-controlled land may be obtained without payment of royalties. Unless specifically provided, do not obtain borrow within the limits of the project site without prior written approval. Consider necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris thereon related operations to the borrow excavation.

3.1.4 Stockpiles

Place and grade stockpiles of satisfactory and wasted materials as specified. Keep stockpiles in a neat and well drained condition, giving due consideration to drainage at all times. Clear, grub, and seal by rubber-tired equipment, the ground surface at stockpile locations. Protect stockpiles of imported materials from contamination which may destroy the

quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsatisfactory, remove and replace such material with satisfactory material from approved sources.

3.2 SURFACE PREPARATION

3.2.1 General Requirements

Remove and replace unsatisfactory material, as directed by the Contracting Officer, in areas to receive fill. Clear, grub, and proof roll placement areas as indicated below.

3.2.2 Frozen Material

Do not place material on surfaces that are muddy, frozen, or contain frost. Finish compaction by dozer, sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Moisten or dry material as necessary to facilitate compaction with the equipment used to meet compaction required.

3.2.3 Proof Rolling

Finish proof rolling on an exposed subgrade free of surface water (wet conditions resulting from rainfall) which would promote degradation of an otherwise acceptable subgrade. For staging areas, after stripping, proof roll the existing subgrade of the staging areas with six passes of a dump truck loaded with 4 cubic yards of soil or 15 ton, pneumatic-tired roller. For material placement areas, proof roll as indicated in the paragraph COMPACTION REQUIREMENTS. Perform proof rolling in a systematic manner to ensure the number of passes over all areas. Notify the Contracting Officer a minimum of 3 days prior to proof rolling. Perform proof rolling in the presence of the Contracting Officer. Undercut rutting or pumping of material as directed by the Contracting Officer and replace with fill and backfill material.

3.2.4 Construction

Shape subgrade to line, grade, and cross section, and compact as specified. Include plowing, disking, and any moistening or aerating required to obtain compaction required for this operation. Remove soft or otherwise unsatisfactory material and replace with satisfactory excavated material or other approved material as directed. Excavate rock encountered during construction of staging areas to a depth of 6 inches below finished grade for the subgrade. Bring up low areas resulting from removal of unsatisfactory material or excavation of rock to required grade with satisfactory materials, and shape the entire subgrade to line, grade, and cross section and compact as specified. Do not vary the elevation of the finish subgrade more than 0.05 foot from the established grade and cross section.

3.3 GRADING AREAS

Where indicated, divide work into grading areas within which satisfactory dredged material will be placed in Wisconsin Point Landfill. Place material in maximum 1 foot loose lifts and compact in accordance with paragraph COMPACTION REQUIREMENTS.

3.4 FINISHING

Finish the surface of excavations, embankments, and subgrades to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. Finish graded areas in a manner that will result in effective drainage. Finish the surface of areas to be turfed from settlement or washing to a smoothness suitable for the application of turfing materials. Repair graded, topsoiled, or backfilled areas prior to acceptance of the work, and re-establish grades to the required elevations and slopes.

3.4.1 Subgrade and Embankments

During construction, keep embankments and excavations shaped and drained. Maintain ditches and drains along subgrade to drain effectively at all times. Do not disturb the finished subgrade by traffic or other operation. Protect and maintain the finished subgrade in a satisfactory condition until ballast, subbase, base, or pavement is placed. Do not permit the storage or stockpiling of materials on the finished subgrade. Do not lay subbase, base course, ballast, or pavement until the subgrade has been checked and approved, and in no case place subbase, base, surfacing, pavement, or ballast on a muddy, spongy, or frozen subgrade.

3.4.2 Grading Around Structures

Construct areas within 5 feet outside of each building and structure line true-to-grade, shape to drain, and maintain free of trash and debris until final inspection has been completed and the work has been accepted.

3.6 DISPOSITION OF SURPLUS MATERIAL

Remove surplus material or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber from Government property and deliver to a licensed/permitted facility or to a location approved by the Contracting Officer.

-- End of Section --

SECTION 31 32 11

SOIL SURFACE EROSION CONTROL

08/08

PART 1 GENERAL

1.1 SUMMARY

The work consists of furnishing and installing temporary and permanent soil surface erosion control materials to prevent the pollution of air, water, and land, including fine grading, blanketing, stapling, mulching, vegetative measures, structural measures, and miscellaneous related work, within project limits and in areas outside the project limits where the soil surface is disturbed from work under this contract at the designated locations. This work includes all necessary materials, labor, supervision and equipment for installation of a complete system. This work also includes removal of temporary erosion control materials following final site stabilization. Submit a listing of equipment to be used for the application of erosion control materials.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D1117	(2001) Standard Guide for Evaluating Nonwoven Fabrics
ASTM D1777	(1996, R2019) Standard Test Method for Thickness of Textile Materials
ASTM D3787	(2016) Bursting Strength of Textiles - Constant-Rate-of-Traverse (CRT), Ball Burst Test
ASTM D4355/D4355M	(2014) Deterioration of Geotextiles from Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D4491/D4491M	(2015) Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4533/D4533M	(2015) Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D4632/D4632M	(2015a) Grab Breaking Load and Elongation of Geotextiles
ASTM D4751	(2016) Standard Test Method for Determining Apparent Opening Size of a Geotextile

Howards Bay SND and GLLA Dredging
AS AWARDED

ASTM D4833/D4833M (2007; E 2013; R 2013) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products

ASTM D6459 (2019) Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Hillslopes from Rainfall-Induced Erosion

ASTM D6460 (2019) Standard Test Method for Determination of Rolled Erosion Control Product (RECP) Performance in Protecting Earthen Channels from Stormwater-Induced Erosion

ASTM D6475 (2017) Standard Test Method for Measuring Mass per Unit Area of Erosion Control Blankets

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act (1940; R 1988; R 1998) Federal Seed Act

Wisconsin Administrative Code

ATCP 20 (June 2011) Seed Labeling and Sale

NR 216 (November 2018) Storm Water Discharge Permits

Wisconsin Department of Natural Resources (WDNR) Conservation Practice Standard

CPS 1052 (November 2018) Non-channel Erosion Mat

CPS 1053 (November 2018) Channel Erosion Mat

CPS 1054 (May 2003) Vegetative Buffer for Construction Sites

CPS 1056 (March 2006) Silt Fence

CPS 1057 (July 2018) Trackout Control Practices

CPS 1058 (June 2003) Mulching for Construction Sites

CPS 1059 (November 2003) Seeding For Construction Site Erosion Control

CPS 1071 (November 2010) Interim Manufactured Perimeter Control and Slope Interruption Products

WISCONSIN DEPARTMENT OF TRANSPORTATION (WisDOT)

WisDOT Standard Specifications (2020 Edition) Standard Specifications For Highway And Structure Construction

WisDOT PAL Erosion Control Product Acceptability List

1.3 DEFINITIONS

1.3.1 Stand of Turf

A stand of at least 3-inch high grassy vegetation that uniformly covers at least 90% of a representative 1 square yard plot.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Work Sequence Schedule; G-AOF

Erosion Control Plan; G-AOF

SD-02 Shop Drawings

Layout; G-AOF

Obstructions Below Ground; G-AOF

Maintenance Record

SD-03 Product Data

Silt Fencing

Mulch Control Netting and Filter Fabric

Geotextile Fabrics

Aggregate

Compost Filter Sock

Erosion Control Blankets

Submit manufacturer's literature including physical characteristics, application and installation instructions for each type of erosion control blanket to be installed.

Seed

Mulch Materials

Fertilizer and Soil Conditioners

Include physical characteristics, and recommendations.

SD-07 Certificates

Installer's Qualification

SD-10 Operation and Maintenance Data

Maintenance Instructions; G-AOF

State approval for seed

1.5 QUALITY ASSURANCE

1.5.1 Installer's Qualification

The installer shall be certified by the manufacturer for training and experience installing the material. Submit the installer's company name and address, and/or certification.

1.5.2 Substitutions

Substitutions will not be allowed without written request and approval from the Contracting Officer.

1.6 DELIVERY, STORAGE, AND HANDLING

1.6.1 Erosion Control Materials

Prior to delivery of materials, submit certificates of compliance attesting that materials meet the specified requirements. Store materials in designated areas and as recommended by the manufacturer protected from the elements, direct exposure, and damage. Do not drop containers from trucks. Material shall be free of defects that would void required performance or warranty. Furnish erosion control blankets and geotextile fabric in rolls with suitable wrapping to protect against moisture and extended ultraviolet exposure prior to placement. Label erosion control blanket and geotextile fabric rolls to provide identification sufficient for inventory and quality control purposes.

1.6.2 Seeding Materials

Inspect seed upon arrival at the jobsite for conformity to species and quality. Seed that is wet, moldy, or bears a test date five months or older, shall be rejected.

1.6.2.1 Seed Protection

Protect from drying out and from contamination during delivery, on-site storage, and handling.

1.6.2.2 Soil Conditioners Delivery

Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, trademark, and indication of conformance to state and federal laws.

1.6.2.3 Seed and Soil Conditioners Storage

Store in cool, dry locations away from contaminants.

1.7 SCHEDULING

1.7.1 General

Submit a construction work sequence schedule, with the state or local government approved Erosion Control Plan a minimum of 30 days prior to start of construction. The work schedule shall coordinate the timing of land disturbing activities with the provision of erosion control measures to reduce on-site erosion and off-site sedimentation. Coordinate installation of temporary erosion control features with the construction of permanent erosion control features to assure effective and continuous control of erosion, pollution, and sediment deposition. Include a vegetative plan with planting and seeding dates and fertilizer, lime, and mulching rates. Distribute copies of the work schedule and Erosion Control Plan to site subcontractors. Address the following in the Erosion Control Plan and meet the requirements of NR 216.46:

- i. Description of construction site activities and statement of erosion control and stormwater control objectives. Include name of receiving water.
- j. Representation of the limits of land disturbance on a USGS 7.5-minute series topographical map.
- k. Description of the intended sequence of major land disturbing construction activities, including methods to be used to minimize the extent of open ground at any one time.
- l. Estimates of the total area of the construction site and the total area of the construction site that is expected to be disturbed by land disturbing construction activities.
- m. Description and implementation schedule of temporary, interim, and permanent erosion control, stormwater control, and air pollution control measures to be implemented on site in accordance with this Section. Address winter stabilization measures as part of the erosion control measures.
- n. Description of the type and frequency of maintenance and inspection activities required for the chosen erosion control methods.
- o. Comparison of proposed post-development stormwater runoff conditions with predevelopment conditions.
- p. Site map(s) showing existing topography and drainage patterns, roads/structures and surface waters; boundaries of the construction site; drainage patterns and approximate slopes anticipated after major grading activities; areas of soil disturbance; location of major structural and non-structural controls identified in the erosion control plan; and location of areas where stabilization practices will be employed.

1.7.2 Planting Conditions and Time Restrictions

Live seed when soil temperatures remain consistently above 53° F. Dormant

seed when the soil temperature is consistently below 53° F (typically November 1 through snow cover). Do not plant when the ground is too dry, snow covered, muddy, or when air temperature exceeds 90 degrees Fahrenheit. Seeding and mulching shall be performed within 14 days of achieving final grade within a grading area. Apply seed within twenty four hours after seed bed preparation. Seeding shall be performed in accordance with WDNR's CPS 1059.

1.8 WARRANTY

Erosion control material shall have a warranty for use and durable condition for project specific installations. Temporary erosion control materials shall carry a minimum eighteen month warranty. Permanent erosion control materials shall carry a minimum three year warranty.

PART 2 PRODUCTS

2.1 MULCH

Mulch shall comply with WDNR CPS 1058 and be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region.

2.1.1 Mulch Materials

2.1.1.1 Straw

Straw shall be stalks from oats, wheat, rye, barley, or rice, furnished in air-dry condition and with a consistency for placing with commercial mulch-blowing equipment.

2.1.1.2 Hay

Hay shall be native hay, sudan-grass hay, broomsedge hay, or other herbaceous mowings, furnished in an air-dry condition suitable for placing with commercial mulch-blowing equipment.

2.1.1.3 Coir

Coir shall be manufactured from 100 percent coconut fiber cured in fresh water for a minimum of 6 months.

2.1.2 Mulch Control Netting and Filter Fabric

Mulch control netting and filter fabric may be constructed of lightweight recycled plastic, cotton, or paper or organic fiber. The recycled plastic shall be a woven or nonwoven polypropylene, nylon, or polyester containing stabilizers and/or inhibitors to make the fabric resistant to deterioration from UV, and with the following properties:

Property	Performance
Minimum grab tensile strength (TF 25 #1/ASTM D4632/D4632M)	180 pounds
Minimum Puncture (TF 25 #4/ASTM D3787)	75 psi in the weakest direction
Apparent opening sieve size	Minimum 40 and maximum 80 (U.S. Sieve Size)

Minimum Trapezoidal tear strength (TF 25 #2/ASTM D4533/D4533M)	50 pounds
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2.2 GEOTEXTILE FABRICS

Geotextile fabrics shall be woven of polypropylene filaments formed into a stable network so that the filaments retain their relative position to each other. Sewn seams shall have strength equal to or greater than the geotextile itself. Install fabric to withstand maximum velocity flows as recommended by the manufacturer. The geotextile shall conform to the following minimum average roll values:

Property	Performance	Test Method
Minimum permittivity	0.12 sec-1	ASTM D4491/D4491M
Tensile Grab Strength	205 lb	ASTM D4632/D4632M
Grab Elongation	15 percent	ASTM D4632/D4632M
Puncture Strength	80 lb	ASTM D4833/D4833M
Apparent Opening Size	30 US Std Sieve	ASTM D4751

2.3 EROSION CONTROL BLANKETS

2.3.1 Class II, Type C Erosion Control Blanket (Channel)

Erosion control blanket installed in the swale or other channelized areas shall meet the requirements meet the requirements for Class II, Type C products identified on the current version of the WisDOT PAL. Class II, Type C Erosion Control Blanket shall be 100% biodegradable woven coir netting with a minimum thickness of 0.25 inches, minimum mass per unit area (ASTM D6475) of 19 ounces per square yard, maximum cover factor (ASTM D6459) of 0.10, minimum permeability shear (ASTM D6460) of 2.0 pounds per square foot, maximum water absorption (ASTM D1117) of 300%, and maximum swell (ASTM D1777) of 30%.

2.3.2 Urban Type B Erosion Control Blanket (Non-channel, Steep Grade)

Erosion control blanket installed non-channel areas with slopes steeper than 4:1 shall meet the requirements for Urban Type B products identified on the current version of the WisDOT PAL. Urban Type B erosion control blanket shall be a machine-produced 100 percent biodegradable with a 100 percent natural and biodegradable matrix and netting. Acceptable matrix materials include excelsior, straw, and/or coconut fiber. The blanket shall be of consistent thickness with the fiber matrix evenly distributed over the entire area of the mat. Netting shall cover the blanket on the top and bottom and consist of 100 percent biodegradable woven natural organic fiber netting. The netting shall consist of machine directional strands formed from two intertwined yarns with cross directional strands interwoven through the twisted machine strands (commonly referred to as a Leno weave). Blanket shall be sewn together with 100 percent biodegradable thread. Urban Type B erosion control blanket shall have the following properties:

Material Content	
Matrix	One of the following fill materials with a total approximate weight of at least 0.5 pounds per square yard: - 100 percent straw fiber - 70 percent straw fiber, 30 percent coconut fiber cured in fresh water

	- 100 percent coconut fiber - 100 percent excelsior
Netting	Both sides: Woven 100 percent biodegradable natural organic fiber forming approximately 1/2 by 1/2 inch mesh
Thread	Biodegradable, sewn 1.5 inch on center.

2.3.3 Urban Type A Erosion Control Blanket (Non-channel, Gradual Grade)

Erosion control blanket installed non-channel areas that have a maximum slope of 4:1 or flatter shall meet the requirements for Urban Type A products identified on the current version of the WisDOT PAL. Erosion control blanket shall be a machine-produced 100 percent biodegradable mat with a 100 percent herbaceous straw. The blanket shall be of consistent thickness with the straw fiber evenly distributed over the entire area of the mat. Netting shall cover the blanket on the top and consist of 100 percent biodegradable woven natural organic fiber netting. Blanket shall be sewn together with 100 percent biodegradable thread. Urban Type A erosion control blanket shall have the following properties:

Material Content	
Matrix	100 percent straw fiber with a total approximate weight of at least 0.5 pounds per square yard
Netting	Top side only: Woven 100 percent biodegradable natural organic fiber forming approximately 1/2- by 1-inch mesh
Thread	Biodegradable, sewn at least 2-inch on center.

2.3.4 Anchors

Anchors shall be 100 percent biodegradable manufactured from recycled plastic or wood and shall be designed to safely and effectively secure erosion control blankets for temporary or permanent applications. The biodegradable anchor shall have dimensions as recommended by the manufacturer. The biodegradable anchor shall be fully degradable by biological activity within a reasonable time frame. The bio-plastic resin used in production of the biodegradable anchor shall consist of polylactide, a natural, completely biodegradable substance derived from renewable agricultural resources. The biodegradable anchor must exhibit ample rigidity to enable being driven into hard ground, with sufficient flexibility to resist shattering. The biodegradable anchor must be designed to resist pull-out from the soil.

2.4 SILT FENCING

Silt fence shall be wire-reinforced as shown on the Drawings.

2.4.1 Filter Cloth:

Silt fencing filter cloth shall consist of woven polyester, polypropylene, stabilized nylon, polyethylene, or polyvinylidene chloride. Filter cloth shall meet the following requirements:

PROPERTY	TEST METHOD	VALUE
Minimum Grab Tensile Strength	ASTM D4632/D4632M	120 LBS (MD) 100 LBS (CD)
Maximum Apparent Opening Size	ASTM D4751	No. 30 Sieve
Minimum Permittivity	ASTM D4491/ D4491M	0.05 sec-1
Minimum UV Stability After 500 Hours of Exposure	ASTM D4355/D4355M	70% Strength Retained

2.4.2 Wire Reinforcement:

Wire backing shall be minimum 14-gauge wire with maximum 6-inch by 6-inch openings.

2.4.3 Supports:

Supports shall be either 1 1/8 inches by 1 1/8 inches air or kiln dried posts of hickory or oak or steel posts with a strength of 1.33 pounds per foot. Wood supports shall be a minimum of minimum 4 feet for 36-inch silt fence. Steel supports shall be minimum 5 feet long. Support spacing shall be maximum 8 feet for woven silt fence fabric. Silt fence fabric shall be attached/secured to the support posts in at least three places on the upslope side of the post.

2.5 COMPOST FILTER SOCK

Compost filter sock shall be a minimum of 12 inches in diameter. Sock fabric shall be 5 mil HDPE mesh with a mesh opening of 3/8-inch and be made of HDPE (5 mil) and meet manufacturer’s material recommendations. Infill shall be well decomposed (matured at least 3 months), weed-free, organic matter. Infill shall comply with WDNR’s CPS 1071, possess no objectionable odors, and contain less than 1%, by dry weight, of manmade foreign matter. Supports shall be hardwood posts installed every 10 feet on center on alternating sides of the compost filter sock. Where staking is not possible, concrete blocks or sand bags shall be used to stabilize the compost filter sock.

2.6 AGGREGATE

Aggregate for the stone tracking pad shall consist of hard, durable, angular stone meeting the gradation below or as specified in CPS 1057. Submit gradation results for aggregate.

Sieve Size	Percent by weight passing
3"	100
2-1/2"	90 - 100
1-1/2"	25 - 60
3/4"	0 - 20
3/8"	0 - 5

2.7 WATER

Unless otherwise directed, water is the responsibility of the Contractor. Water shall be potable or supplied by an existing irrigation system.

2.8 SEED

2.8.1 Classification

Provide State-approved seed of the latest season's crop delivered in original sealed packages, bearing producer's guaranteed analysis for percentages of mixtures, purity, germination, weed seed content, and inert material. Label in conformance with AMS Seed Act and applicable state seed laws. Wet, moldy, or otherwise damaged seed will be rejected. Field mixes will be acceptable when field mix is performed on site in the presence of the Contracting Officer.

2.8.2 Permanent Seed

Common Name	Species	Pounds per Acre
Oats* (See note)	<i>Avena sativa</i>	37.88
Blue Giant Hyssop	<i>Agastache foeniculum</i>	0.06
Butterfly Milkweed	<i>Asclepias tuberosa</i>	0.06
Stiff Sunflower	<i>Helianthus pauciflorus</i>	0.06
Wild Bergamot	<i>Monarda fistulosa</i>	0.06
Stiff Goldenrod	<i>Oligoneuron rigidum</i>	0.06
Large-flowered Beard Tongue	<i>Penstemon grandiflorus</i>	0.19
Black-eyed Susan	<i>Rudbeckia hirta</i>	0.31
Gray Goldenrod	<i>Solidago nemoralis</i>	0.04
Heath Aster	<i>Symphotrichum ericoides</i>	0.04
Smooth Aster	<i>Symphotrichum laeve</i>	0.06
Hoary Vervain	<i>Verbena stricta</i>	0.19
Bearded Birdfoot Violet	<i>Viola pedatifida</i>	0.01
Big Bluestem	<i>Andropogon gerardii</i>	0.70
Kalm's Brome	<i>Bromus kalmii</i>	2.04
Canada Wild Rye	<i>Elymus canadensis</i>	1.00
Junegrass	<i>Koeleria macrantha</i>	0.22
Little Bluestem	<i>Schizachyrium scoparium</i>	3.27
Indian Grass	<i>Sorghastrum nutans</i>	0.64
White Prairie Clover	<i>Dalea candida</i>	0.06
Purple Prairie Clover	<i>Dalea purpurea</i>	0.27
*Winter wheat may be used as an alternate to oats where germination is needed later in the fall.		

Proportion seed mixtures by weight. Permeant seed mix shall be applied at a rate of on 47.2 pounds of Pure Live Seed (PLS) per acre. Seed germination shall meet the requirements of Wisconsin Administrative Code Chapter ATCP 20.

2.8.3 Temporary Seed

Areas needing protection when permanent seeding is not applied shall be seeded with annual species for temporary protection. Temporary seeding shall include one of the following:

Species	Lbs/Acre	Percent Purity	Seeding Season
Annual Ryegrass	80	97	Fall
Cereal Rye	131	97	Fall
Winter Wheat	131	95	Fall
Oats	131	98	Spring and Summer

Temporary seeding must later be replaced by plantings for a permanent stand of grass. The same requirements of turf establishment apply for temporary seeding.

2.9 FERTILIZER AND SOIL CONDITIONERS

Fertilizer and soil conditioner requirements shall be determined based on results of topsoil nutrient testing performed as required by Section 02 66 00 SELECT FILL AND TOPSOIL FOR LANDFILL COVER.

PART 3 EXECUTION

3.1 WEATHER CONDITIONS

Perform erosion control operations under favorable weather conditions; when excessive moisture, frozen ground or other unsatisfactory conditions prevail, the work shall be stopped as directed. When special conditions warrant a variance to earthwork operations, submit a revised construction schedule for approval. Do not apply erosion control materials in adverse weather conditions which could affect their performance.

3.2 SITE PREPARATION

3.2.1 Underground Facilities

Verify and mark the location of underground utilities and facilities in the area of the work. Repair damage to underground utilities and facilities during installation of soil erosion controls at the Contractor's expense.

3.2.2 Layout

Submit scale drawings defining areas to receive recommended materials as required by federal, state or local regulations. Erosion control material locations may be adjusted to meet field conditions.

3.2.3 Protecting Existing Vegetation

When there are established lawns in the work area, the turf shall be covered and/or protected or replaced after construction operations. Identify existing trees, shrubs, plant beds, and landscape features that are to be preserved on site by appropriate tags and barricade with reusable, high-visibility fencing along the dripline. Mitigate damage to existing trees at no additional cost to the Government. Damage shall be assessed by a state certified arborist or other approved professional using the National Arborist Association's tree valuation guideline.

3.2.4 Obstructions Below Ground

When obstructions below ground affect the work, submit shop drawings showing proposed adjustments to placement of erosion control material for approval.

3.3 INSTALLATION

Stabilize areas for construction access immediately as specified in the paragraph Construction Access Pad. Install sediment controls before any

major site grading takes place. Provide additional sediment controls as grading progresses. Remove temporary erosion control measures after site stabilization and as directed by the COR.

3.3.1 Tracking Pad

Provide as indicated on Drawings at points of vehicular ingress and egress on the construction site. Install in accordance with WDNR's CPS 1057. Pads shall be cleared and grubbed prior to placement of the Geotextile Fabric and aggregate. The aggregate shall be placed in a manner that will prevent damage and movement of the fabric. Place fabric in one piece, where possible. Overlap fabric joints a minimum of 12 inches.

3.3.2 Temporary Erosion Controls (Silt Fencing, Compost Filter Sock)

Provide temporary erosion controls in accordance with this paragraph and WDNR's CPS 1056 and CPS 1071. If alternate sequencing, erosion control methods or spacing are proposed by the Contractor, the Contractor shall document using WDNR's Soil Loss & Sediment Discharge Calculation Tool that the sediment discharge due to soil loss from the site is less than 5 tons per acre over a 12-month period.

3.3.2.1 Locations

Install temporary erosion controls at the location(s) shown or indicated in the Contract Documents and where required. Contractor shall install, maintain, and relocate (as necessary) temporary erosion controls during fill placement to comply with the requirements herein and shall confirm controls are in proper condition before expected precipitation events. Install and maintain silt fencing in a vertical plane. Where possible, install temporary erosion controls along contour lines so that each given run of temporary erosion controls is at the same elevation. The ends of temporary erosion controls shall be extended upslope to prevent water from flowing around the ends of the control. On slopes, install temporary erosion controls at intervals that do not exceed a maximum interval of 30 feet of slope on bare ground or 100 feet of slope on seeded/mulched ground.

Provide temporary erosion controls around perimeter of each stockpile of topsoil, select fill material, and dredged material. Install temporary erosion controls before expected precipitation and maintain until stockpile is removed.

Do not install temporary erosion controls at the following types of locations:

- a. Area of concentrated storm water flows such as ditches, swales, or channels.
- b. Where rock or rocky soils prevent full and uniform anchoring of temporary erosion controls.
- c. Across upstream or discharge ends of storm water piping or culverts.

3.3.2.2 Installation

3.3.2.2.1 Silt Fence

Comply with WDNR's CPS 1056 for placement, operation, and maintenance. Securely fasten filter cloth to support posts. When two sections of filter cloth abut each other, secure fabric to posts and wrap posts around each other to produce stable joint or overlap the distance between two posts. Embed posts in the ground to the depth necessary for proper controls; embed posts to not less than 20 inches below ground. Filter cloth shall extend not less than 6 inches below ground and not less than 24 inches above ground.

3.3.2.2.2 Compost Filter Sock

Compost filter sock shall be installed with a minimum 24 inch overlap (or as required by manufacturer if more restrictive) between adjacent compost filter socks shingled in the direction of flow. Compost filter socks shall be entrenched at minimum of 2 inches on disturbed ground and staked or anchored as recommended by the manufacturer's recommendations to maintain ground contact along the entire length of the product at all times.

3.3.2.3 Maintenance

Remove sediment accumulated at temporary erosion controls as required. Repair and reinstall temporary erosion controls as required.

3.3.3 Seeding

Seeding shall be performed in accordance with WDNR's CPS 1059 and this Section.

3.3.3.1 Preparation

Provide soil preparation (including soil conditioners as required), fertilizing, seeding, and surface topdressing of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations. After areas have been brought to indicated finish grade, incorporate fertilizer, pH adjusters, and soil conditioners (as necessary based on recommendations of soil testing) into soil a minimum depth of 4 inches by disking, harrowing, tilling or other method approved by the Contracting Officer. Remove debris and stones larger than 3/4 inch in any dimension remaining on the surface after finish grading. Correct irregularities in finish surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

3.3.3.2 Seeding

3.3.3.2.1 Seed Application Seasons and Conditions

Immediately before seeding, restore soil to proper grade. Do not seed when ground is muddy, frozen, snow covered or in an unsatisfactory condition for seeding. If special conditions exist that may warrant a variance in the seeding dates or conditions, submit a written request to the Contracting Officer stating the special conditions and proposed variance. Apply seed within twenty-four hours after seedbed preparation. Sow seed by approved sowing equipment. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing.

3.3.3.2.2 Seed Application Method

Seeding method shall be by broadcast and drop seeding or drill seeding.

3.3.3.2.2.1 Broadcast and Drop Seeding

Seed shall be uniformly broadcast at the rate specified in PRODUCTS. Use broadcast or drop seeders. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing. Cover seed uniformly to a maximum depth of 1/4 inch by means of spike-tooth harrow, cultipacker, raking or other approved devices.

3.3.3.2.2.2 Drill Seeding

Drill seed uniformly to an average depth of 1/4 inch.

3.3.3.2.3 Rolling

Immediately after seeding, firm entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width and install mulch or erosion control blanket. If seeding is performed with cultipacker-type seeder, rolling may be eliminated.

3.3.4 Mulching

3.3.3.4.1 Hay or Straw Mulch

Hay or straw mulch shall be spread uniformly at the rate of 2 tons per acre. Mulch shall be spread by hand, blower-type mulch spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading.

3.3.3.4.2 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.3.4 Mulch Installation

Install mulch in the areas indicated and in accordance with WDNR CPS 1058.

3.3.3.3.4 Mulch Control Netting

Netting may be stapled over mulch according to manufacturer's recommendations.

3.3.4 Erosion Control Blankets

Install erosion control blankets in accordance with this Section and the applicable WDNR Conservation Practice Standards, which include CPS 1053 for channel installation and CPS 1052 for non-channel installation.

- a. Before placing the erosion control blankets, ensure the subgrade has been graded smooth; has no depressed, void areas; is free from obstructions, such as tree roots, projecting stones or other foreign matter. Verify that mesh does not include invasive species. Vehicles will not be permitted directly on the blankets.
- b. Install erosion control blankets as indicated and in accordance with manufacturer's recommendations.
- c. Orient erosion control blankets in vertical strips and anchored with staples in accordance with manufacturer's recommendations. Abut adjacent strips to allow for installation of a common row of staples. Overlap horizontal joints between erosion control blankets sufficiently to accommodate a common row of staples with the uphill end on top.
- d. Where exposed to overland sheet flow, locate a trench at the uphill termination. Staple the erosion control blanket to the bottom of the trench. Backfill and compact the trench as required.
- e. Where terminating in a channel containing an installed blanket, the erosion control blanket shall overlap installed blanket sufficiently to accommodate a common row of staples.

3.4 CLEAN-UP

Dispose of excess material, debris, and waste materials offsite at an approved landfill or recycling center. Clear adjacent paved areas. Immediately upon completion of the installation in an area, protect the area against traffic or other use by erecting barricades and providing signage as required, or as directed.

3.5 WATERING SEED

Start watering areas seeded as required by temperature and wind conditions. Apply water to supplement rainfall at a sufficient rate to ensure moist soil conditions to a minimum 2 inch depth. Prevent run-off and puddling. During the germination process, seed is to be kept actively growing and not allowed to dry out. Do not drive watering trucks over turf areas, unless otherwise directed. Prevent watering of other adjacent areas or plant material.

3.6 MAINTENANCE OF TURF AREAS

Immediately after turfing, protect area against traffic and other use. Maintain the newly seeded areas in good condition until an acceptable stand of turf is developed and until acceptance. Temporary erosion control materials shall be removed following establishment of acceptable stand of turf as directed by the COR and disposed offsite in accordance with federal, state, and local regulations. Contractor will be required to repair any areas of erosion and reseed as necessary until complete coverage and satisfactory stand of turf is achieved for a period of at least one growing season.

3.7 RESTORATION

Restore to original condition existing turf areas which have been damaged during turf installation operations at the Contractor's expense. Keep clean at all times at least one paved pedestrian access route and one paved vehicular access route to each building. Clean other paving when work in adjacent areas is complete.

3.8 MAINTENANCE RECORD

Furnish a record describing the maintenance work performed, record of measurements and findings for product failure, recommendations for repair, and products replaced.

3.8.1 Maintenance

Maintenance shall include eradicating weeds; protecting embankments and ditches from surface erosion; maintaining the performance of the erosion control materials and mulch; protecting installed areas from traffic; and reapplying fertilizer 1 year after the initial fertilizer application.

3.8.2 Maintenance Instructions

Furnish written instructions containing drawings and other necessary information, describing the care of the installed material; including, when and where maintenance should occur, and the procedures for material replacement. Submit instruction for year-round care of installed material. Include manufacturer supplied spare parts.

3.8.3 Patching and Replacement

Unless otherwise directed, material shall be placed, seamed or patched as recommended by the manufacturer. Remove material not meeting the required performance as a result of placement, seaming or patching from the site. Replace the unacceptable material at no additional cost to the Government.

-- End of Section --

SECTION 35 20 23.13

NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM
SCOW - MONITORING PROFILE

PART 1 GENERAL

1.1 DESCRIPTION

The work under this contract requires use of the National Dredging Quality Management Program (DQM) to monitor the scow's status at all times during the contract, and manage data history.

This performance-based specification section identifies the minimum required output and precision and instrumentation requirements. The requirements may be satisfied using equipment and technical procedures selected by the Contractor.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office responsible for review of the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00, "SUBMITTAL PROCEDURES":

SD-01 Preconstruction Submittals

Dredge Plant Instrumentation Plan; G-AOF

Contractor Quality Control Plan; G-AOF

SD-06 Test Reports

Data Appropriately Archived e-mail; G-AOF

SD-07 Certificates

Letter of National Dredging Quality Management Program Certification;
G-AOF

1.3 PAYMENT

No separate payment will be made for installation, operation and maintenance for the DQM certified system as specified herein for the duration of the dredging operations; all costs in connection therewith will be considered a subsidiary obligation of the Contractor and covered under the contract unit prices for dredging in the bidding schedule.

1.4 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM CERTIFICATION

The Contractor is required to have a current certification from the DQM for the scow instrumentation system to be used under this contract. Criteria for certification shall be based on the most recent specification posted on the DQM website (<http://dqm.usace.army.mil/Specifications/Index.aspx>), Compliance with these criteria shall be verified by on-site quality assurance (QA)

checks conducted by DQM Support Center Data Acquisition and Analysis Team, and by periodic review of the transmitted data. If a system is installed specifically for this contract, the QA checks should take place prior to any material being loaded into the scow to insure that it is capable of transmitting quality data to the DQM database or with prior approval of local district, during the first load for each scow, and subsequent loads as is necessary to verify compliance. A DQM Certification is valid for one year from the date of certification and is contingent upon the system's ability to meet the performance requirements as outlined in sections 3.3 and 3.5. If issues with data quality are not corrected within 48 hours, the system certification shall be revoked and additional QA checks by the Data Acquisition Team may be necessary.

Annual DQM Certification shall be based on:

A series of QA checks as described in section 3.4 "Compliance Quality Assurance Checks"

Verification of data acquisition and transfer (Section 3.3)

Review of the Dredge Plant Instrumentation Plan (DPIP) as described in Section 1.5

The dredging contractor shall have personnel who are familiar with the system instrumentation and who have the ability to recalibrate the sensors on site during the QA process. The dredging contractor shall coordinate pickup times and locations and provide transportation to and from any platform with a DQM system to team personnel in a timely manner. The dredging contractor shall also have on site for the QA checks a tug capable of towing the scow. As a general rule, Data Acquisition and Analysis Team personnel will come with PPE consisting of hardhats, steel toe boots, and life jackets. If additional safety equipment is needed, such as eye protection, safety harnesses, work gloves or personal location beacons, these items shall be provided to the team while on site. The Contractor shall submit a test data package to the DQM Database from the system on each scow and have it accepted by the DQM Support Center prior to scow compliance checks. The Contractor shall also submit data collected during the QA Checks from the scow monitoring system to the DQM database and the Data Acquisition Team personnel while on site. It is the dredging contractor's obligation to inform the QA team if the location designated for the QA checks has any site specific safety concerns prior to their arrival on site.

The owner or operator of the scow shall contact DQM at DQM-AnnualQA@rpsgroup.com on an annual basis, or at least three weeks prior to the proposed beginning of dredging, to schedule QA checks. This notification is meant to make the Data Acquisition Team aware of a target date and the contract on which the plant will be used. At least one week prior to the target date, the dredging contractor shall contact the Data Acquisition team and verbally coordinate a specific date and location. The contractor shall then follow-up this conversation with a written e-mail confirmation. The owner/operator shall coordinate the QA checks with all local authorities, including but not limited to, the local USACE contracting officer.

Re-certification is required for any yard work which produces modification to displacement (i.e. change in scow lines, repositioning or repainting hull marks), modification to bin volume (change in bin dimensions or addition or subtraction of structure) or changes in sensor type or location; these

changes shall be reported in the sensor log section of the DPIP. A system does not have to be transmitting data between jobs, however in order to retain certification during this period, the system sensors or hardware should not be disconnected or removed from the scow. If the system is powered down, calibration coefficients shall be retained.

1.5 DREDGE PLANT INSTRUMENTATION PLAN (DPIP)

The Contractor shall have a digital copy of the DPIP on file with the National DQM Support Center. The Contractor shall also maintain a copy of the DPIP on a working dredge on site which is easily accessible to government personnel at all times. This document shall describe the sensors used, configuration of the system, how sensor data will be collected, how quality control on the data will be performed, and how sensors/data reporting equipment will be calibrated and repaired if they fail. A description of computed scow specific data and how the sensor data will be transmitted to the DQM Database shall also be included. The Contractor shall submit to the DQM Support Center any addendum or modifications made to the plan, subsequent to its original submission, prior to start of work.

The DPIP shall include the following as a minimum:
(DPIP must have table of content in the following order)

- Dredging Company
 - Scow Point of Contact
 - Telephone Number
 - Email address
- Scow Monitoring System Provider
 - Scow Monitoring System Point of Contact
 - Telephone Number
 - Email address
- Scow Name/ID
- Sensor repair, replacement, installation, modification or calibration methods
- Data reporting equipment
- Procedure for providing sensor data/computed data to DQM Database via e-mail
- System Power Supply
- System Battery Charge Method
- Documentation on how the contract number will be changed if the system is left on past the end of the contract
- System telemetry
- Dimensioned Drawings of the Scow
 - A typical plan and profile view of the scow showing:
 - Bin cross sections
 - Locations of required sensors referenced to:
 - fore and aft perpendicular

- bin length, depth, width, zero reference
- external hull draft markings (latitudinal, longitudinal, keel)
- each other
- overall scow dimensions

- Criteria and method used to increment trip number

- Description of how the UTC time stamp is collected

- Positioning system
 - brand name and specifications
 - sampling rates for data acquisition (standard vs. disposal)
 - scow heading instrumentation brand name and specifications
 - instrument used to calculate COG
 - any calculation done external to the instrumentation
 - certificates of calibration and/or manufacturer certificates of compliance
 - A description of how scow speed is determined

- Hull status
 - Instrumentation brand name and specifications
 - Certificates of calibration and/or manufacturer certificates of compliance
 - Any calculation done external to the instrumentation
 - Criteria for determining hull open/closed

- Contractor Data
 - Backup frequency
 - Backup method
 - Post processing

- Archive capability

- Documentation of:
 - test methods used by the Contractor to provide quality control of data
 - verification that the reported values are applicable for the sensor and application

- Quality Control Plan as per section 3.5
 - Name of Quality Control Systems Manager
 - Procedures for checking collected data against known values
 - Procedures for verifying telemetry is functioning

- Log of sensor performance and modifications

- Log of Contractor data backup as per section 3.2.6

Any changes to the computation methods during the contract shall be approved by the DQM Support Center prior to their implementation.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 SPECIFICATIONS FOR REPORTED DATA

The Contractor shall provide, operate and maintain all hardware and software to meet these specifications. The Contractor shall be responsible for replacement, repair and calibration of sensors and other necessary data acquisition equipment needed to supply the required data.

Repairs shall be completed within 48 hours of any sensor failure. Upon completion of a repair, replacement, installation, modification or calibration the Contractor shall notify the Contracting Office's Representative (COR). The COR may request re-calibration of sensors or other hardware components at any time during the contract as deemed necessary.

The Contractor shall keep a log of sensor repair, replacement, installation, modification and calibration in the on-site copy of the DPIP. The log shall contain a three-year history of sensor maintenance to include: the time of sensor failures (and subsequent repairs), the time and results of sensor calibrations, the time of sensor replacements, and the time that backup sensor systems are initiated to provide required data. It shall also contain the name of the person responsible for the sensor work.

Sensors installed shall be capable of collecting parameters within specified accuracies and resolutions indicated in the following subsections and transmit them to the DQM Database.

With the exception of position and any value calculated, reported sensor values should represent a weighted average with the highest and lowest values not included in the calculated average for the given interval. The averaging routine used should be consistent across all event triggers. This information should be documented in the DPIP sections that say "Calculations done external to the instrumentation".

These data reporting requirements cover the collection of electronic data on a scow through the entire dredging cycle. Disposal events can consist of both open water disposal and offloading. Open water disposal is the placement of material via bottom doors or split hull. Offloading is the placement of material via either hydraulic or mechanical means.

3.1.1 Scow Name

Each scow shall be assigned a unique name that will remain constant from one dredging operation to the next.

3.1.2 Contract Number

The USACE Assigned contract number for the project will be reported.

3.1.3 Trip Number

A DQM trip number shall document the end of a disposal event for a given scow.

3.1.3.1 Offloading

The trip number will be incremented at the completion of each disposal/removal of material from the scow. Each scow shall maintain a

separate trip numbering sequence - i.e. each scow will start with a trip number of 1, that will be incremented by 1 each time that scow completes a disposal. The trip number must be calculated and repeatable based on a given logic; it may not necessarily correspond to the trip number logged aboard the dredge or tug. Efforts shall be made to include logic that avoids false trip number increments, while also not allowing the routine to miss any disposal events.

3.1.3.2 Project Trip Number

A project trip number is not unique to a particular dredge plant, but is unique to a contract. Like a scow trip number, the project trip number shall document the end of a disposal event. Project trip numbering will begin at number 1 at the start of the contract, and will be incremented by 1 at the completion of each disposal event or emptying of the dredge material. The trip number must be calculated and repeatable based on a given logic. Efforts shall be made to include logic that avoids false trip number increments, while also not allowing the routine to miss any disposal events.

3.1.4 Horizontal Positioning

Geographic coordinates of the vessel as indicated by the location of the GPS antenna. All locations shall be obtained using a Positioning System operating with a minimum accuracy level of 1 to 3 meters horizontal Circular Error Probable (CEP). Positions shall be reported as Latitude/Longitude WGS 84 in decimal degrees. West Longitude and South Latitude values are reported as negative.

3.1.5 Date and Time

The date and time shall be reported to the nearest second and referenced to UTC time based on a 24 hour format; yyyy-mm-dd hh:mm:ss.

3.1.6 Hull Status

Hull status is meant to reflect a condition when material could be removed or released from the scow. *For this contract, hull status shall register closed prior to leaving the disposal area.*

3.1.6.1 Offloading

For non-dumping scows, the "OPEN" value shall indicate that the bin is in the process of being unloaded, either by pumping or mechanical means.

3.1.7 Course

Scow course-over-ground (COG) shall be provided using industry standard equipment. The Contractor shall provide scow course over ground (to the nearest whole degree) with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

3.1.8 Speed

Scow speed-over-ground shall be provided in knots using industry standard equipment with a minimum accuracy of 1.0 knots and resolution to the nearest 0.1 knot.

3.1.9 Heading

Scow heading shall be provided using industry standard equipment. The scow heading shall be accurate to within 5 degrees and reported to the nearest whole degree, with values from 000 (true north) to 359 degrees referenced to a clockwise positive direction convention.

3.1.10 Draft

All reported draft measurements shall be in feet, tenths and hundredths with an accuracy of + 0.1 foot relative to observed physical draft readings. The measurements shall be reported at a resolution of two decimal places (hundredths of a foot). Reported forward draft value shall be equal to the sum of the visual forward port and starboard draft mark readings divided by 2. Reported aft draft value shall be equal to the sum of the visual aft port and starboard draft mark readings divided by 2. Forward draft, aft draft and average draft will be reported. Sensors shall be placed at an optimum location on the scow to be reflective of observed physical draft mark readings at any trim or list. The sensor value reported shall be an average of at least 10 samples per event, remove at least one maximum value and one minimum value, and average the minimum 8 remaining values. When average draft is calculated for the purpose of determining displacement, significant digits for average draft shall be maintained such that if forward draft was 0.15 and aft draft was 0.1 then the average draft would be 0.125.

3.1.11 Displacement

Scow displacement shall be reported in long tons, based on the most accurate method available for the scow. The minimum standard of accuracy for displacement is interpolation from the displacement table, based on the average draft. For this contract, the density of water used to calculate displacement shall be 1000 kg/m³ (1g/cm³) kg/cubic meter (freshwater) and shall be used for an additional interpolation between the fresh and salt water tables.

3.2 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SYSTEM REQUIREMENTS

Contractors DQM system shall be capable of collecting, displaying, and transmitting information to the DQM Database. The parameters which shall be reported to the DQM Database include: trip number, date and time, hull status, scow course, and scow speed. An easily accessible, permanent visual display on the scow shall show in real time the parameters collected by the system in the same units as data submitted to the DQM database. In the event a reported parameter is calculated based on multiple sensors, the sensor values as used in the equation shall be able to be viewed in addition to the required parameter. If a hardware problem occurs, or if a part of the system is physically damaged, then the Contractor shall be responsible for repairing it within 48 hours of determination of the condition.

3.2.1 Telemetry

The Contractor may select any commercial satellite, cellular phone, or other data communications systems available, as long as it is capable of transmitting real time data, as well as enough additional band width to clear historically queued data when a connection is re-obtained. The telemetry system shall be always available and have connectivity in contract area at least 12 out of 24 hours, capable of transmitting all queued data. Telemetry

systems must be capable of meeting these minimum reporting requirements in all operating conditions meeting the required minimum data transmission interval (section 3.2.3) and is able to transmit the data to the DQM Database via the Internet in the required mail message format. The data transition process from the scow to the DQM database must be automated. The data may be sent from the scow directly to the DQM database or to a shore based computer system. Data transmitted to the DQM Database should be raw data; any processing of the data conducted shore side shall be done using repeatable automated software or programming routine. A description of this process shall be included in the DPIP.

3.2.2 Data Reporting Frequency

Disposal activities shall be logged with high temporal and spatial resolution. Data shall be logged as a series of events. Each set of measurements (i.e. time, position, etc...) will be considered an event. All required information in section 3.1 that are not an averaged variable (i.e. draft and ullage) shall be collected within one second of reported time. Data shall be measured with sufficient frequency by the scow system to resolve the events to the accuracy specified in the following table. Any averaged variable must be collected and computed within this sampling interval. Event Types "Sailing", "Loading/Stationary" and "Offloading" and "Open Water Disposal" are triggered by a time criteria; the criteria should be consistent across the "Sailing" and "Open Water Disposal" event types and should not change for the data collected on a given scow. This criterion should be documented by the contractor in the DPIP.

Event Type	Event Trigger Descriptions	Event Time Resolution	Event Position Resolution
Loading/ Stationary	No change in position with hull status closed An elapsed time of 1 hour since the last event No change in position with hull status open -----NONCLOSURE----- In the event a scow has completed an open water disposal and transited back to a holding station without closing the hull, the sampling shall be changed to once per hour	1 minute	NA
Sailing	Change in position with hull status closed Time from the last sample equals 1 minutes	1 second	+/-10 ft
Open Water Disposal	Hull status open A position must be recorded within 1 second of the hull status going from closed to open and again within 1 second of the hull status going from open to closed The position shall be reported at any equal interval from 6 to 12 seconds. This interval shall always remain consistent for the dredge plant.	1 second	+/-10 ft
Offloading	Offloading material, hull status reported as open A position must be recorded within 1 minute arrival at the offload location and within	1 second	+/-10 ft

one second of the material starting to be removed from scow. Time from the last sample equals 1 minute.

-----STANDBY OFFLOADING-----

In the event a scow is not being actively offloaded at the offload location for a time equal to one hour, sampling interval shall be equal to once an hour. 1 minute

Example: Scow is stationary for 1 hour 15 minutes, and then the scow sails to the disposal area. You should have a "Loading/Stationary" event at time zero, time 1 hour, and time 1 hour 15 minutes. Then, for Sailing, within 1 second of an elapsed time of 1 minute from the 1 hour 15 minutes event, another event occurs.

3.2.3 Data Transmission to Web Service

A Simple Object Access Protocol (SOAP) web service shall be used to report sensor data to the DQM Database. Data shall be transmitted as it is collected in real time and pushed to the DQM web service. If the web service is not available or returns an Error message, the data shall be stored in a queue and transmitted upon re-establishment of the connection, starting with the oldest data in the queue and continuing until real-time transmission is restored. Delays in pushing real time data to the DQM database should not exceed four hours. Exceptions to these requirements may be granted by the DQM center on a case by case basis with consideration for considering contract specific requirements, or site specific conditions, and extreme weather events.

The web service provides synchronous or asynchronous calls to the Enqueue method, whose fields are:

Key	GUID string identifying the contractor
Subject	Plant identification string
Data	Scow XML data element with one point's sensor readings

Please contact dqm-support@usace.army.mil to obtain the web service URL and the appropriate Key credentials.

Upon transmitting the Key (e.g. `12345678-90AB-CDEF-1234-567890ABCDEF`), Subject (e.g. `2099`), and Data (example in next section), the service will respond with one of the following responses.

If the Key element identifying the contractor was invalid, the service will respond with:

Error: Invalid/Expired GUID

If the Plant or Data elements were incorrect (e.g. if the XML string is not well-formed SCOW_DREDGING_DATA), the service will respond with:

Error: Invalid Format

If there is an error within the service itself, the service will respond with:

Error: Service Unavailable

If all fields were correct, the service will respond with a SHA 256 hexadecimal checksum of the Data field, e.g.:

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67DE1F8FA6989415BE817D1E3ABF6A3B761624F09AE02F5DF9FC63D15196F322

If all fields were correct, but the Key for this contractor will soon expire, the service will respond with the new key, as well as a SHA 256 hexadecimal checksum of the Data field. The new Key and the checksum will be separated by a pipe `|` character for simpler parsing, e.g.:

Warning: Update GUID to FEDCBA09-8765-4321-FEDC-
BA0987654321|67DE1F8FA6989415BE817D1E3ABF6A3B761624F09AE02F5DF9FC63D15196F322

Upon receipt of the Update GUID warning above, the contractor should update the Key transmitted in further calls to the service, as the current Key will expire within a short timeframe. The new Key will be available for use immediately. After the contractor uses the new Key for the first time, the service will immediately disable the old Key.

Communication with the DQM web service can be conducted either synchronously or asynchronously. For synchronous communication, the system provider's web service should wait for the results before sending the next line of XML data.

3.2.4 XML-Formatted Sensor Data String

Each scow event shall be passed as a string on one continuous line of data. The example below is broken up by variable for ease of reading:

```
<?xml version="1.0"?>
<SCOW_DREDGING_DATA version="2.5">
  <SCOW_NAME>AU1994</SCOW_NAME>
  <CONTRACT>W123BA-09-D-0087_RL01</CONTRACT>
  <PROJECT_TRIP_NUMBER>102</PROJECT_TRIP_NUMBER>
  <TRIP_NUMBER>34</TRIP_NUMBER>
  <X_POSITION>-81.670632</X_POSITION>
  <Y_POSITION>41.528987</Y_POSITION>
  <DATE_TIME>2010-08-14 10:50:15</DATE_TIME>
  <SCOW_SPEED>0.0</SCOW_SPEED>
  <SCOW_COURSE>0.0</SCOW_COURSE>
  <HULL_STATUS>OPEN</HULL_STATUS>
  <SCOW_HEADING></SCOW_HEADING>
  <SCOW_FWD_DRAFT></SCOW_FWD_DRAFT>
  <SCOW_AFT_DRAFT></SCOW_AFT_DRAFT>
  <SCOW_AVG_DRAFT></SCOW_AVG_DRAFT>
  <ULLAGE_FWD></ULLAGE_FWD>
  <ULLAGE_AFT></ULLAGE_AFT>
  <ULLAGE_AVG></ULLAGE_AVG>
  <SCOW_BIN_VOLUME></SCOW_BIN_VOLUME>
  <SCOW_DISPLACEMENT></SCOW_DISPLACEMENT>
  <SCOW_LIGHTSHIP></SCOW_LIGHTSHIP>
  <SCOW_TDS></SCOW_TDS>
  <ADDITIONAL_DATA>Some more scow info, if needed</ADDITIONAL_DATA>
</SCOW_DREDGING_DATA>
```

It should be noted that date values shall be formatted as follows: YYYY-MM-DD HH:MM:SS, as shown above. If for any reason a field has no value, send the enclosing XML tags with nothing between them, e.g. <DRAFT_AFT></DRAFT_AFT>. The web service cannot handle a "null" value or any other indicators of no value collected.

3.2.5 Contractor Data Backup

The Contractor shall maintain an archive of all data sent to the DQM database during the dredging contract. The COR may require, at no increase in the contract price, that the Contractor provide a copy of these data covering specified time periods. The data shall be provided in the HTML format which would have been transmitted to the DQM database. Data submission shall be via storage medium acceptable to the COR.

At the end of the dredging contact, the Contractor shall contact the National DQM Support Center prior to discarding the data to ensure it has been appropriately archived. The Contractor shall record in a separate section at the end of the scow's on-site copy of the DPIP the following information:

- a. Person who made the call
- b. The date of the call
- c. The DQM representative who gave permission to discard

The same day of the phone call and prior to discarding the data, the Contractor shall submit a "Data Appropriately Archived e-mail" to the local districts Contracting Officer's Representative with the above information, and Cc: the DQM Support Center representative providing permission. In addition to the above information, also include in the e-mail:

- d. Project name and contract number
- e. Scow start and end dates
- f. Name of the scow

3.3 PERFORMANCE REQUIREMENTS

The Contractor's DQM system shall be fully operational at the start of dredging operations and fully certified prior to moving dredge material on the contract (see section 1.4, National Dredging Quality Management Program Certification). To meet contract requirements for operability, in addition to certification, the Contractor's system shall provide a minimum an accurate data and be compliant with DPIP requirements (Section 1.5). Quality data strings are considered to be those providing accurate values for all parameters reported when operating according to the specification. Repairs necessary to restore data return compliance shall be made within 48 hours. If the Contractor fails to report required data within the specified time window for scow measurements (see Section 3.2.2 "Data Measurement Frequency" and 3.2.3 "Data Reporting"), or if the system has not received DQM certification prior to dredging; the system will be declared not in compliance, and the Contractor will be assessed liquidated damages equivalent to the additional oversight hours that would be required for Corps personnel to be on site from the first full day after the system is deemed not operational through to the time when the system is returned to fully operational status. For this contract, the liquidated damages shall be \$500.00 per day.

3.4 COMPLIANCE QUALITY ASSURANCE CHECKS

Quality assurance checks are required prior to the commencement of dredging, and at the discretion of a COR periodically throughout the duration of the contract. As part of the testing requirements, the dredging contractor shall provide the above personnel an easily accessible visual display of measurements from the scow monitoring system in the same units that are

submitted to the DQM database. These measurements shall be provided in real-time on the scow or near real-time on location. The Dredging contractor shall also submit data collected during the QA checks from the scow monitoring system to the DQM database at completion of the checks. Detailed instructions for performing these checks and a spreadsheet for recording the results are available at <http://dqm.usace.army.mil/Certifications/Index.aspx>. Incoming data shall be periodically reviewed to assure compliance with performance requirements outlined in section 3.3.

For annual instrumentation checks and compliance monitoring, the DQM Data Acquisition Team personnel attempt to be as flexible as possible in performing their checks so as not to delay work; however, in order to expedite matters as much as possible, it is necessary that they receive the support and cooperation of the local district and dredging contractor. The dredging contractor shall coordinate pickup times and locations and provide transportation to and from any platform with a DQM certified system in a timely manner. Calibrations to the sensors should already be performed before DQM personnel arrive on site.

3.4.1 Position Check

During the QA checks, both the static position of the scow and a dynamic tracking of movement through each of the event triggers (section 3.2.2) will be monitored by an independent GPS unit. The inspector GPS data shall be compared to the data that is collected by the DQM certified system for the same period. The data should be provided to the Data Acquisition Team by the system provider while onsite. The Data Acquisition Team will confirm position of the scow, verify that data collection intervals change as each of the scow event triggers change, and will check all data reporting requirements. A contractor furnished tug will be required to transport the scow during this check. Throughout the contract, the COR will periodically verify reported positions by independently measuring with other equipment to verify locations.

3.4.2 Hull Status Check

The Contracting Officer's Representative will document the angle at which the hull status sensor registers "OPEN" and "CLOSED".

3.5 CONTRACTOR QUALITY CONTROL

Dredging contractor shall designate a quality control systems manager (QCSM), who shall develop and maintain daily procedures to ensure the contractor's quality control (CQC) of the DQM system. These methods shall include a procedure by which data being collected is checked against known values and telemetry is verified to be functioning. The Contractor Quality Control Plan which describes these methods and procedures shall be included in the DPIP as per section 1.5. This is the only section which shall be submitted to the local district and is a required submittal prior to the start of the contract. CQC Reports may be required at the discretion of the QAR daily. Annotations shall be made in the CQC Report documenting all actions taken on each day of work including all deficiencies found and corrective actions taken.

3.6 LIST OF ITEMS PROVIDED BY THE CONTRACTOR

DPIP

Sec 1.5 Dredge Plant Instrumentation Plan

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DQM SYSTEM

Sensor Instrumentation Sec. 3.1 Specifications for Reported Data

SCOW DATA

Event documentation Sec. 3.2.2 Data Measurement Frequency

Data reports Sec. 3.2.3 Data Reporting

-- End of Section --

SECTION 35 20 23.43

STRATEGIC NAVIGATION DREDGING

PART 1 GENERAL

1.1 UNIT PRICES

The contract unit price per cubic yard for dredging and excavation includes the cost of removal, conveyance, and disposal of all materials meeting the requirements of paragraph "CHARACTER OF MATERIALS" within the limits as shown on the drawings and as specified herein, except original materials, ledgerrock, boulders, wrecks, scrap materials, snags, stumps, driftwood, piles, debris or other material which cannot be removed by the plant specified in the accepted bid, or the equivalent of such plant, without special apparatus. The unit price must also include the cost of all work required to be performed for the use of the Government-furnished disposal facility and include all work as specified in SECTION 35 20 23.13 NATIONAL DREDGING QUALITY MANAGEMENT PROGRAM SCOW - MONITORING PROFILE. The Contractor may elect to remove excepted material by special means at prices agreed and approved in accordance with applicable provisions of the contract.

1.2 DEFINITION

Hard material is defined as material requiring the use of special equipment for economical removal, and includes boulders or fragments too large to be removed in one piece by the dredge.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following must be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Sounding Equipment Description and Calibration Data

Submit proposed sounding equipment and transducer frequency verification prior to commencing work. Include verification that equipment has been calibrated in accordance with EM 1110 2 1003.

Dredging, Conveyance and Placement Plan; G-AOF

Prior to bringing equipment to the project site, submit plans of the proposed dredging, conveyance and placement operations to include:

- a. Off-loading site preparation and protection.
- b. Equipment to be used.
- c. Conveyance method of placing material.

Dredging Placement Safety Plan; G-AOF

Prior to commencing work at the placement area, describe in detail the means and methods to be utilized to provide for the public safety at the placement area in accordance with the Accident Prevention Plan.

Notice of Start of Dredging

Provide five calendar days advance written notice of the planned start of actual dredging operations to allow the Government to schedule and perform the prior-to-dredging sounding survey work before arrival of the dredging equipment.

SD-02 Shop Drawings

Soundings

Submit drawings of sounding surveys during progress of work.

SD-06 Test Reports

Daily Report of Dredging Operations; G-AOF

Report of Operations forms (ENG FORM 4267 or ENG FORM 27A), as appropriate to the type of work being performed, are available in RMS and must be completed and furnished daily. Each report must include a statement in the "REMARKS" space attesting that no overflow or discharge occurred from the dredging vessel(s) while dredging and while in transit from the dredging area to the unloading area. In the event an overflow or discharge occurs while dredging or while in transit, notify the Contracting Officer immediately and submit a written report on the incident within 48 hours of occurrence. When appropriate and approved, quality control compliance inspections may be reported under the "REMARKS" item on the form in RMS.

SD-11, Closeout Submittals

Material Disposal Records

Records indicating quantity and location of dredged material placement in the Government-furnished disposal facility.

Existing Condition Photographs of Disposal Facility Structures

1.4 CHARACTER OF MATERIALS

Material dredged from the required dredging prisms may contain shoaled silt and sand and native silty clay and organic silt. Material dredged from the overdepth dredging prism may also contain native silty clay and organic silt, as well as shoaled silt and sand. Manmade material and debris may be encountered.

Woody debris of varying shapes and sizes was distributed throughout the harbor during a flood event in 2012. It is anticipated that woody debris will be encountered in the dredge areas. Additionally, it is inherent in dredging operations in an old commercial industrial harbor like Duluth Superior Harbor, to encounter an array of man-made debris (including, but not limited

to, cable, ratchets, tires, shipwrecks, scrap materials of various composition, processed rock, riprap)

The records of previous dredging and sampling are available for inspection at the Office of the Engineering, Design & Construction Office, U.S. Army Corps of Engineers, Detroit District, 477 Michigan Avenue, McNamara Building, Detroit, Michigan

1.5 DISPOSAL FACILITY CONDITIONS

The existing conditions shown within the Government-furnished disposal facility were traced from aerial imagery. Dredged materials placed outside of the limits of the placement area must be removed at no additional cost to the Government and deposited within the area approved for placement of dredged materials. The Contractor is informed that the existing topographic features and conditions have changed within Erie Pier Confined Disposal Facility (CDF) subsequent to the date of the imagery shown on the contract drawings. Water elevations within the CDF vary throughout the year. The ability of existing materials in the CDF to support equipment and personnel is unknown. The Contractor must make its own investigations of conditions as it deems necessary for the selection of equipment to be used at the site and to provide for the safety of the work and workers.

1.6 DELIVERY OF PLANT AND ORDER OF WORK

Prior to bringing equipment to the project site, submit a Dredging, Conveyance and Placement Plan describing in detail the proposed means and methods for accomplishing the required work. Unless otherwise directed by the Contracting Officer, complete the required work within the time established in the contract documents.

1.7 ARTIFICIAL OBSTRUCTIONS

Except as indicated in the contract drawings, the Government has no knowledge of cables, pipes, or other artificial obstructions or of any wrecks, wreckage, or other material that would necessitate the employment of additional equipment for economical removal. Any existing channel crossing that is damaged due to the Contractor's operations must be repaired by the Contractor and at its expense. If actual conditions differ from those stated or shown, or both, an adjustment in contract price or time for completion, or both, will be made in accordance with CLAUSE 52.236-2 Differing Site Conditions.

1.8 SHOAL REMOVAL

If, before the work is completed, shoaling occurs in any section previously accepted by the Government, including shoaling in the finished channel, because of the natural lowering of the side slopes or other natural causes, re-dredging at the Contract unit price, within the limit of available funds, may be performed if agreed upon by both the Contractor and the Contracting Officer.

1.9 VOLUME CALCULATIONS

In project areas surveyed using single-beam sonar, the volume of material removed will be calculated using the average end area method. The HYPACK

software Philadelphia Pre Dredge and Post Dredge volume calculation method will be used for all single-beam volume computations.

In project areas surveyed using multi-beam sonar, the volume of material removed will be computed using a TIN (Triangulated Irregular Network) model as outlined in the Hydrographic Surveying Manual EM-1110-2-1003. The HYPACK software TIN model Philadelphia volume calculation method will be used for all multi-beam volume computations. A 1 foot by 1 foot matrix using the average depth sounding will be generated from the edited multi-beam data to perform the TIN volume computations. Plotted plan view sheets with soundings representative of the data used in volume computation will be produced using a matrix cell size that is plot-scale dependent and displaying the minimum depth sounding within each cell.

Plots of soundings provided to the Contractor during administration of this contract will be a graphical representation only and must not be used for volume calculations. Survey data used for volume computations will be available to the Contractor upon request.

1.10 EXCESSIVE DREDGING

Materials taken from beyond the limits specified in paragraphs "Overdepth Dredging" and "Side Slopes", will be excluded from the computed total amount dredged as either excessive channel dredging or excessive side slope dredging, for which payment will not be made. The final determination of the amounts of excessive dredging will be based wholly on the surveys made for final examination and acceptance in accordance with paragraph "FINAL EXAMINATION AND ACCEPTANCE."

1.11 MONTHLY PARTIAL PAYMENTS

Monthly partial payments will be based on quantities determined by soundings taken by the Contractor or other means acceptable to the Contracting Officer. (See CLAUSE entitled, "QUANTITY SURVEYS.") Sounding surveys for partial payment must be conducted in the same manner specified in paragraph, "Method of Measurement," unless otherwise authorized or directed.

1.12 CONTINUITY OF WORK

Monthly partial payments will be made for work performed prior to final examination and acceptance. However, as final dredging is being performed for final examination and acceptance, no payment will be made for such final dredging work performed in any area until the depth required under the contract is secured in the whole of such area, unless prevented by ledge rock, original material, or other obstructions, which cannot be removed by the plant specified in the accepted bid, or the equivalent of such plant, without blasting or special apparatus. No payment will be made for final excavation in any area not adjacent to and in prolongation of areas where full depth has been secured, except by decision of the Contracting Officer. If a nonadjacent area is excavated to full depth during the day to day operations carried on under the contract, payment for all work therein may be deferred until the required depth has been secured in the area intervening.

1.13 ALLOWABLE PAY OVERDEPTH AND SIDESLOPES

The total estimated dredging quantity shown on the Bidding Schedule includes the required depth material plus the allowable overdepth material and allowable sideslope material. The allowable pay overdepth quantity is computed for the allowable overdepth prism immediately below the material required to be dredged as shown on the drawings or otherwise specified. The allowable sideslope quantity is computed immediately above the payment limit line for sideslopes as shown and specified in the contract drawings.

Estimated overdepth and sideslope quantities are as follows:

Overdepth = 13,800 CY
Sideslope = 6,700 CY

1.13.1 Overdepth Dredging

To cover inaccuracies of the dredging process, materials actually removed from within the channel lines to a depth of not more than one (1) foot below the required pay prism line will be measured and paid for at the contract unit price. However, the maximum quantity of overdepth materials to be paid for will be equivalent to that quantity present within the one (1) foot overdepth prism immediately below the required materials to be removed as determined from the prior to dredging soundings. Any dredging below the allowed one (1) foot will be considered as excessive dredging and for which payment will not be made.

1.13.2 Sideslopes

Materials actually removed, within limits shown on the contract drawings, to provide for final side slopes not flatter than one vertical (1V) on two horizontal (2H), perpendicular to the channel line or dredge limit line, whichever is applicable, but not in excess of the amount originally lying above the side slope payment limit line will be calculated and paid for. The provisions of this Subparagraph also apply to end slopes at the upstream and downstream dredging limits of the channel.

Use of the box cut method is prohibited on this contract.

1.13.3 Shoals

This Contract does not include a vertical shoal tolerance above the required pay prism line.

1.14 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain during the life of the contract, environmental protective measures. Also, provide environmental protective measures required to correct conditions, such as oil spills or debris, that occur during the dredging operations. Comply with Federal, State, and local regulations pertaining to water, air, and noise pollution.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 DREDGING

Five (5) calendar days prior to any dredging work being performed the Contractor must provide written Notice of Start of Dredging to the Contracting Officer so that the Government can schedule and perform prior soundings. The Contractor must perform all dredging work to remove material to the required depths within the limits shown on the drawings. Any materials in the allowable overdepth prism and allowable side slopes are not required to be removed. Rocks, cobbles (3 to 12 inches) and boulders (over 12 inch) may be encountered near breakwaters, revetments and pier heads and must not be removed if they are part of the harbor structures and toe stones must not be undermined. Indicated required dredging areas within required downstream and upstream dredging limits will be revised by the Government, after obtaining the before (prior to) dredging soundings. The Contractor may be required to suspend dredging at any time when for any reason the gauges or ranges cannot be seen or properly followed.

3.1.1 Obstructions

If original material, ledge rock, boulders, cobbles, rock fragments, wrecks, scrap materials, snags, stumps, piles, debris or other material is encountered and cannot be removed by the plant specified in the accepted bid, or an equivalent plant, without blasting or special apparatus, the Contractor must remove therefrom all overlying material within the required dredging prism that in the judgment of the Contracting Officer can be removed by the use of the plant specified in the accepted bid or equivalent plant.

3.1.2 Channel Crossing

Any existing channel crossing that is damaged due to the Contractor's operations must be repaired by the Contractor and at its expense.

3.2 INSPECTION

Inspect the work, keep records of work performed, and ensure that gages, targets, ranges, and other markers are in place and usable for the intended purpose.

3.3 TURBIDITY MONITORING

Monitor turbidity during Strategic Navigation Dredging when one or both of the following conditions apply:

1. Dredging performed prior to 01 July
2. Dredging in areas that overlap Dredge Management Units

3.3.1 Background Turbidity Monitoring

Monitor background turbidity in accordance with Section 35 20 23.53 paragraph Background Turbidity Monitoring.

3.3.2 Performance Turbidity Monitoring

Monitor turbidity during dredging performance in accordance with Section 35 20 23.53 paragraph Performance Turbidity Monitoring.

3.3.3 Turbidity Results Evaluation

Compare results of performance turbidity monitoring to background levels in accordance with Section 35 20 23.53 paragraph Turbidity Results Evaluation.

3.3.4 Turbidity Compliance Limits

Control turbidity in accordance with Section 35 20 23.53 paragraph Turbidity Compliance Limits.

3.3.5 Turbidity Corrective Measures

Take corrective measures in accordance with Section 35 20 23.53 Turbidity Corrective Measures.

3.3.6 Turbidity Reporting and Documentation

Document results of turbidity monitoring and report exceedance of action level in accordance with Section 35 20 23.53 paragraph Turbidity Reporting and Documentation.

3.4 CONDUCT OF DREDGING WORK

3.4.1 Restriction

The Contractor must not dredge below a grade three (3) feet above pipes, cables, tunnels, and other submerged crossings shown on the contract drawings or indicated in these specifications (see Special Contract Requirements clauses "Drawings, Maps, and Specifications" and "Physical Data"). This restriction applies for a distance of twenty-five (25) feet upstream and twenty-five (25) feet downstream of each channel crossing. Any existing crossing that is damaged due to Contractor operations must be repaired by the Contractor at his expense.

3.4.2 Order of Work

The Contractor must submit a work plan outlining the proposed order of work as part of the Dredging, Conveyance and Placement Plan. Once the work plan has been approved, the Contractor may proceed in accordance with the approved plan.

3.4.3 Lights

From sunset to sunrise or during periods of restricted visibility, provide lights for floating plants, pipelines, ranges, and markers. Also, provide lights for buoys that could endanger or obstruct navigation. When night work is in progress, maintain lights from sunset to sunrise for the observation of dredging operations. Lighting must conform to United States Coast Guard requirements for visibility and color.

3.4.4 Ranges, Gages, and Lines

Furnish, set, and maintain ranges, buoys, and markers needed to define the work and to facilitate inspection. Establish and maintain gages in locations observable from each part of the work so that the depth may be determined. Suspend dredging when the gages or ranges cannot be seen or followed. The

Contracting Officer will furnish, upon request by the Contractor, survey lines, points, and elevations necessary for the setting of ranges, gages, and buoys.

3.4.5 Plant

Maintain the plant, scows, coamings, barges, pipelines, and associated equipment to meet the requirements of the work. Promptly repair leaks or breaks along pipelines. Remove dredged material placed due to leaks and breaks.

3.4.6 Safety of Structures

The prosecution of work must ensure the stability of piers, bulkheads, and other structures lying on or adjacent to the site of the work, insofar as structures may be jeopardized by dredging operations. Repair damage resulting from dredging operations, insofar as such damage may be caused by variation in locations or depth of dredging, or both, from that indicated or permitted under the contract.

3.4.7 Plant Removal

Upon completion of the work, promptly remove plant, including ranges, buoys, piles, and other markers or obstructions from the project site.

3.5 DISPOSAL OF DREDGE MATERIAL

3.5.1 Equipment

All nautical vessels, pipelines and land based transport and conveyance systems must be operated, loaded, and unloaded in such manner as to prevent overflow, spills, leaks, waste, or other loss of dredged materials between point of pick-up and point of deposition within the disposal facility. Hauling vessels must have sufficient sidewall height and integrity to prevent drainage over or through the sides and bottom during hauling.

3.5.2 Method of Disposal

The method employed by the Contractor in conveying dredged materials to the disposal facility must be as approved by the Contracting Officer at all times. Temporary dumping or placement of materials outside of the material placement area for subsequent re-handling into the material placement area is prohibited unless otherwise approved by the Contracting Officer.

3.5.3 Transfer Site

Take soundings across the full width and length of the transfer site mooring area prior to the start-up of and immediately after the completion of transfer operations under the contract. Soundings must be taken on lines and at intervals acceptable to the Contracting Officer. Prior and after surveys of the transfer site must be submitted to the Government.

3.5.4 Vehicular Conveyance

Dredged materials that are conveyed into the material placement area via vehicle must have leak tight cargo bodies or compartments with spill and splash preventing devices as well as necessary sidewall height. Vehicles must

not be loaded over their capacity, and axle loads must not exceed the limits of the thoroughfare over which the vehicles are operated. If the dredged materials are transferred from vessels to vehicles by bucket type equipment or any device which may leak or spill, provisions must be made to prevent water and materials from escaping into the waterways. In addition, the Contractor must insure that materials that are splashed around vehicles during loading or unloading operations are cleaned up prior to the vehicle leaving the site so as to prevent materials from being tracked on to public thoroughfares or escaping into the waterways. The Contractor must immediately clean up any materials spilled on the public thoroughfares. In addition, the Contractor must maintain the transfer site in a neat and orderly condition.

3.5.5 Placement in Indicated Areas

Prior to placement of dredge material, the Contractor must submit a Dredging Placement Safety Plan, describing in detail the means and methods to be utilized to provide for the public safety at the disposal facility. The dredged materials must be deposited within the Government-furnished placement area as shown on the contract drawings. The Government-furnished placement area has sufficient capacity to contain all materials to be dredged. The placed dredge material must not exceed an elevation of 1 foot below the top of the existing berm elevation. Placement of the dredged materials within the disposal facility must be as specified and shown except as otherwise directed by the Contracting Officer. Except as otherwise authorized by the Contracting Officer in writing, a representative of the Contractor for Quality Control must be present during all placement operations. The method employed by the Contractor for placing dredged materials in the disposal facility must be as approved by the Contracting Officer at all times.

3.5.6 Mislplaced Material

Any material that is deposited elsewhere than in the places designated in the contract or approved by the Contracting Officer will not be paid for. The Contractor must remove such misplaced material at its expense and deposit it in the place designated in this contract or approved by the Contracting Officer.

3.5.7 Condition of Scows, Hoppers, and Pipelines

All scows and hoppers used for transporting the dredged material must be kept in good condition with coamings in repair. Decks of vessels must be cleaned of dredged material before leaving the dredging area.

3.5.8 Unloading of Scows

When scow unloading is performed with the use of a clamshell or bucket, the transfer site must be returned to its original condition by removing all material deposited thereon to the satisfaction of the Contracting Officer.

3.5.9 Navigation Warnings

Furnish and maintain navigation warning signs along the pipeline.

3.5.10 Method of Communication

Provide a system of communication between the dredge crew and the crew at the disposal area. A portable two-way radio is acceptable.

3.5.11 Salvaged Material

Anchors, chains, firearms, and other articles of value, which are brought to the surface during dredging operations, must remain or become the property of the Government and must be deposited on shore at a convenient location near the site of the work, as directed.

3.6 ERIE PIER CONFINED DISPOSAL FACILITY

3.6.1 General

All dredged materials from the Strategic Navigation Dredge Prism must be placed within the confines of the Erie Pier CDF. Placed materials must not interfere with the flow of water through existing drainage ditches. Upon completion of disposal operations, the interior surface of the disposal facility which was utilized for or disturbed by the Contractor's operations, excluding the material placement area and borrow areas under this contract, must be restored to a condition equal to or better than that existing prior to the Contractor's use of the site. Transfer of dredged materials into the CDF by hauling vessels positioned along the perimeter dike of the disposal facility at a location other than shown on the contract drawings may be allowed upon approval of the Contracting Officer. Existing drainage ditches along the existing perimeter access road must be maintained in a well-drained condition by the Contractor throughout the course of the work. The Contractor must provide fall protection atop the existing mechanically stabilized earth (MSE) wall anytime the safety hand railing is removed.

3.6.2 Erie Pier Disposal Area Transfer and Conveyance

A mooring facility for access to the harbor's edge and unloading of equipment for transferring dredged materials from marine vessels (such as barges or scows) into land based vehicles is provided by the Government at the location shown on the contract drawings. If the Contractor elects to utilize the lower off-loading area along the existing steel sheet pile (SSP) wall, a load limit of 1100 lbs/sq. ft for off-loading equipment must be enforced. The Contractor must address protection of the off-loading platform in the Dredging, Conveyance and Placement Plan. The plan must include the proposed methods and materials to be utilized and supporting calculations to verify that the load limit will not be exceeded. Dredged materials must be conveyed into the required placement area by off road dump truck or other Government approved method. The Contractor must prevent dredged materials and water from spilling back into or being discharged into the harbor during transfer operations. Outside of the off-loading ramp, no material is permitted above elevation 605.0 ft between the existing MSE wall and the precast concrete (Jersey) barriers.

3.6.3 Structure and Fender Maintenance

The Contractor must repair or replace any timber fenders and any part of the existing structures on the disposal facility which are damaged or destroyed by the Contractor's operations under this contract. Document the condition of the structures with photographs before use and again after the work is performed. Submit existing condition photographs of disposal facility structures to the Government.

3.6.4 Confined Water Control

In the event water contained within the CDF threatens to overtop the existing dikes or cause untreated discharge to the public waters, the Contractor must report the situation to the Contracting Officer immediately. If the overtopping appears imminent and such condition is the result of the Contractor's placement of dredged materials or other action or lack of action by the Contractor, the Contractor must immediately submit a plan for the Contracting Officer's approval for preventing the overtopping or discharge to the public waters. The Contractor must take all actions necessary to prevent the overtopping or discharge in accordance with the approved plan and at no additional cost to the Government and no additional time for completion of the contract work.

3.6.5 Trees, Brush, Vegetation and Debris

The Government-furnished disposal areas are overgrown with trees, brush and other vegetation. The Contractor may cut down and cover such trees, brush and vegetation within the disposal area as may be necessary for its disposal operation and to facilitate flow toward the weirs. Trees, brush, vegetation and debris must be buried within the CDF, in an area approved by the Contracting Officers Representative.

3.7 CONTRACTOR QUALITY CONTROL

The Contractor must establish and maintain a quality control system for dredging and placement operations to assure compliance with the Contract requirements and provide a Daily Report of Dredging Operations by completing the appropriate form and completing all inspections of items under this system, including, but not limited to, the following:

- a. Layout of work, and placement areas.
- b. Proper dredging depths and placement elevations.
- c. Conveyance and placement operations.
- d. Removal of misplaced material.
- e. Safety requirements.

3.8 GOVERNMENT INSPECTION

3.8.1 Gauge Maintenance

The Contractor must maintain its gauges, ranges, location marks and limit marks in proper order and position. The presence of a Government inspector does not relieve the Contractor of its responsibility for the proper execution of the work in accordance with the specifications and drawings.

3.8.2 Facilities

The Contractor must furnish, on the request of the Contracting Officer or any inspector, the use of such boats, boat operators, laborers and materials that are part of the ordinary and usual equipment and crew of the dredging plant as may be reasonably necessary in inspecting the work. However, the

Contractor will not be required to furnish such facilities for the surveys prescribed in paragraph "FINAL EXAMINATION AND ACCEPTANCE."

3.8.3 Transportation

The Contractor must furnish, on the request of the Contracting Officer or any inspector, suitable transportation from designated points on shore to and from the various pieces of off-shore plant and off-shore placement areas.

3.8.4 Compliance

If the Contractor refuses, neglects, or delays compliance with these requirements, the specific facilities may be furnished and maintained by the Contracting Officer, and the cost of doing so will be deducted from any amounts due or to become due the Contractor.

3.9 MEASUREMENT

The material removed will be measured in bank cubic yards (cubic yards in place), by means of soundings taken before and after dredging. The Government will make prior and after surveys and may make check surveys. The Contractor must make check surveys using sonic sounding methods to inspect work in progress and assure dredging depths and extents comply with the Contract requirements. Additional soundings will be taken as the Contracting Officer may deem necessary. Only one (1) prior survey of required work areas will be made by the Government. If additional prior surveys are required, due to the Contractor's operations, the cost of such surveys must be paid by the Contractor. The cost of such surveys is the same as specified in paragraph "FINAL EXAMINATION AND ACCEPTANCE".

3.9.1 Method of Measurement

Hydrographic surveys must be conducted to meet USACE accuracy standards defined in EM 1110-2-1003. Surveys must be performed by single vertical beam transducer or multibeam sweep methods. All depth measurement devices, positioning, and motion compensation systems must be calibrated following the quality control procedures outlined in EM 1110-2-1003. The same equipment must be used for prior and after surveys, using the same work platform.

3.9.2 Sounding Methods for Quantity and Clearance Surveys

The Government may elect to use single beam or multibeam sounding equipment for surveys.

3.10 FINAL EXAMINATION AND ACCEPTANCE

3.10.1 Examination

As soon as practicable after the completion of the entire work or any section thereof (if the work is divided into sections) as in the opinion of the Contracting Officer will not be subject to damage by further operations under the contract, such work will be thoroughly examined at the cost and expense of the Government by sounding or by sweeping, or both, as determined by the Contracting Officer. Should any shoals, lumps or other lack of contract depth be disclosed by this examination, the Contractor is required to remove same by dragging the bottom or by dredging at the contract rate for dredging, but if the bottom is soft and the shoal areas are small and form no material

obstruction to navigation, the removal of such shoals may be waived at the discretion of the Contracting Officer. The Contractor or its authorized representative will be notified when soundings and/or sweepings are to be made, and will be permitted to accompany the survey party. When the area is found to be in a satisfactory condition, it will be accepted finally. Should more than two (2) sounding or sweeping operations by the Government over an area be necessary by reason of work for the removal of shoals disclosed at a prior sounding or sweeping, the cost of such third and any subsequent sounding or sweeping operations will be charged against the Contractor at the rate of \$3,500 per calendar day in which the Government plant is engaged in sounding or sweeping and/or is enroute to or from the site or held at or near the said site for such operations.

3.10.2 Acceptance

Final acceptance of the whole or part of the work and the deductions or corrections of deductions made thereon will not be reopened after having once been made, except on evidence of collusion, fraud, or obvious error, and the acceptance of a completed section will not change the time of payment of the retained percentages of the whole or any part of the work.

-- End of Section --

SECTION 35 20 23.53

ENVIRONMENTAL DREDGING
04/06

PART 1 GENERAL

1.1 DEFINITION

1.1.1 Hard Material

Hard material is defined as material requiring the use of special equipment for economical removal, and includes boulders or fragments too large to be removed in one piece by the dredge.

1.1.2 Contaminated Sediments

Soft sediments within Howards Bay containing Total PAHs, tributyltin, lead, and/or mercury at concentrations greater than the preliminary remedial goals identified in the Design Document Report, GLLA Sediment Cleanup in Howards Bay, Superior, Wisconsin (DDR). Approximate locations of contaminated sediments are shown on the Drawings.

1.1.3. Native Material

Red clay material that is denser than the overlying soft sediment that serves as a confining layer and is not contaminated (as defined above).

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

TESTAMERICA LABORATORIES, Inc. (TA)

TA SOP No. BR-GC-008 (Rev. 10) Organotin Concentrations Using Gas Chromatograph/Flame Photometric Detector

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 1110-2-1003 (November 30, 2013) Hydrographic Surveying

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA SW-846 (Update V) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods

Wisconsin Department of Natural Resources

NR 40 (April 2015) Invasive Species Identification, Classification and Control

Manual Code #9183.1 (June 16, 2016) Boat, Gear, and Equipment Decontamination and Disinfection Protocol

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Sounding/Positioning Equipment Description And Calibration Data; G-AOF

Verification that the Contractor's sounding and/or positioning equipment has been calibrated to correspond with the Government's Hydrographic Surveying Manual EM 1110-2-1003, equipment shall be submitted prior to commencing work. Also submit the description of the Contractor's sounding/positioning equipment prior to commencing work.

Environmental Dredging Plan; G-AOF

Prior to bringing equipment to the project site, submit plans of the proposed environmental dredging and conveyance operations. Include schedule for completing work and means and methods for performing verification testing of equipment positioning software. Schedule must reflect ability to complete DMUs (including sampling and cover) in the same season the environmental dredging is started.

Notice Of Start Of Environmental Dredging

Provide 14 calendar day's advance written notice of the planned start of actual environmental dredging operations to allow the Government to schedule and perform the prior-to-dredging sounding survey work before arrival of the dredging equipment.

SD-02 Shop Drawings

Check Surveys

Submit drawings of surveys and/or equipment positioning system data collected during progress of work.

SD-03 Product Data

Turbidity Monitoring Systems; G-AOF

SD-06 Test Reports

Daily Report Of Environmental Dredging Operations; G-AOF

Report of Dredging Operations forms (ENG FORM 4267, ENG FORM 27A, or similar as appropriate to the type of work being performed) are in the Quality Control System (QCS) and shall be completed and furnished daily. Each report shall contain in the "REMARKS" space attesting that no overflow or discharge occurred from the dredging vessel(s)

while dredging and while in transit from the dredging area to the offloading area. In the event an overflow or discharge occurs while dredging or while in transit, an oral notification shall be made to the Contracting Officer in shortest possible time and complete written report on the incident submitted to the Contracting Officer within 24 hours of the incident. When appropriate and approved, quality control compliance inspections may be reported under the "REMARKS" item on the form. Submit Daily Report of Engineering Dredging Operations to Contracting Officer in electronic format daily.

1.4 MATERIAL TO BE REMOVED

Dredging conditions specified and indicated describe conditions which are known. However, the Contractor is responsible for other conditions encountered which are not unusual when compared to conditions recognized in the dredging business as usual in dredging activities such as those required under this contract. The character of material to be removed is presented in the DDR. The records of previous dredging and sampling are available electronically upon request to the Contracting Officer.

Woody debris of varying shapes and sizes was distributed throughout the harbor during the flood event of 2012. It is anticipated that woody debris will be encountered in the dredge areas. Additionally, it is inherent in dredging operations in an old commercial / industrial harbor as Duluth-Superior Harbor, to encounter an array of man-made debris e.g. cable, ratchets, tires, wrecks, scrap materials of various composition, processed rock, riprap, etc.

1.4.1 Hard Material

The removal of hard material is not included. If dredging cannot be performed to dredge prism elevations shown in the Drawings due to hard material, Contractor shall immediately notify the Contracting Officer and survey the location of the hard material. Should the Government direct in writing that hard material be removed, the work shall be performed and an adjustment in the contract price or time for completion, or both, will be made in accordance with Clause 52.236-2 Differing Site Conditions. If hard material is to be removed, blasting will not be permitted.

1.4.2 Native Material

The removal of native material is not required. If native material is encountered above the dredge prism elevations shown in the Drawings, Contractor shall immediately notify the Contracting Officer and survey the location of the native material. The Contracting Officer will verify that native material has been encountered and dredging in the area of the native material is complete.

1.5 SEQUENCING AND SCHEDULING

1.5.1 No Work Required and no Work Allowed Dredge Periods

See Section 01 35 13.10 SPECIAL PROJECT PROCEDURES regarding no work required period. See Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS regarding no work allowed periods. No work under this section shall be performed without the Contracting Officer (or their representative) present, unless specifically approved in writing by the Contracting Officer.

1.5.2 Delivery of Plant and Order of Work

Prior to bringing equipment to the project site, the contractor shall submit an Environmental Dredging Plan describing in detail how the Contractor plans on accomplishing the proposed work. Contractor shall also submit Sounding/Positioning Equipment Description and Calibration Data prior to mobilizing equipment to the site. Unless otherwise directed by the Contracting Officer, the Contractor shall accomplish the required work within the time established in the Request For Proposal.

1.5.3 Dredge Area Sequencing

The sequence of environmental dredging performed under this section shall be coordinated through the Contracting Officer and shall be as follows, unless otherwise approved by the Contracting Officer:

- a. Hughitt Ave. Slip
- b. Cummings Ave. Slip
- c. Fraser Slip
- d. Frog Pond area (Unit FP-1 and FP-2)
- e. OC-1 through OC-5 followed by FC-1 and FC-2
- f. OC-6 through OC-8 followed by FC-3 through FC-4
- g. OC-9, followed by FC-5 and FC-6
- h. OC-11 and OC-12, followed by FC-9
- i. OC-14, followed by FC-12 and FC-13
- j. OC-16 and OC -17, followed by FC-17, FC-16, FC-15, and FC-14

Coordinate sequencing with Duluth Superior Concrete, CHS Inc., and Fraser Shipyards, Inc. shipping schedules (as applicable). Environmental dredging, sampling and cover placement in a DMU shall be completed in the same season in which it was started. Environmental dredging performed under this section may be performed simultaneously as the navigational dredging under SECTION 35 20 23.43 STRATEGIC NAVIGATIONAL DREDGING provided that navigation dredging is not performed in the same area as environmental dredging, simultaneous dredging is approved by the Contracting Officer and updated environmental dredge prisms have been provided (Contractor shall allow up to 14 calendar days between completion of navigational dredging survey and issuance of updated dredge prisms).

1.6 ARTIFICIAL OBSTRUCTIONS

The area of a known debris field, primarily consisting of timber piles and reinforced concrete, is shown on the Drawings. Debris will also be encountered outside this area and may include scrap metal, rubbish, and other items typically found in an industrial waterway. Wood waste is not considered an obstruction for the purposes of this Section and shall be removed to achieve dredge target elevation shown in the Drawings. Except as indicated, the Government has no knowledge of cables, pipes, or other artificial obstructions or of any wrecks, wreckage, or other material that would necessitate the employment of additional equipment for economical removal. If, during dredging, any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, activities

that may damage or alter such resources will be suspended in accordance with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

Prior to or concurrent with dredging, the Contractor shall remove debris encountered. Debris removed from the dredged area shall be removed from the water. Disposal shall be the responsibility of the Contractor and disposal shall be outside the limits of government property. In case the actual conditions differ from those stated or shown, or both, an adjustment in contract price or time of completion, or both, will be made in accordance with Clause 52.236-2 Differing Site Conditions. Any existing channel crossing that is damaged due to the Contractor's operations shall be repaired by the Contractor at its expense.

1.7 QUANTITY OF MATERIAL

1.7.1 Soundings

The contract drawings (See SECTION CLAUSE entitled "CONTRACT DRAWINGS, AND SPECIFICATIONS") represent the conditions existing at the time of survey. Determination of quantities removed will be made from before and after environmental dredging soundings taken by the government and the calculations made there from to determine quantities by in-place measurement. The government determination of the quantities to be paid for in the area specified, after having once been made, will not be reopened, except on evidence of collusion, fraud, or obvious error.

1.7.2 Volume Calculations

In project areas surveyed using multi-beam sonar, the volume of material removed will be computed using a TIN (Triangulated Irregular Network) model as outlined in the Hydrographic Surveying Manual EM 1110-2-1003. The HYPACK software TIN model Philadelphia volume calculation method will be used for all multi-beam volume computations. A 1-foot, by 1 foot matrix using the average depth sounding will be generated using a plot-scale dependent matrix cell utilizing the minimum depth from the 1 by 1 average dataset used to calculate volumes. The COR may opt to cut cross sections and run volumes using average end area method or standard Hypack volume calculation method to compare cross sections and volumes with the contractor.

In project areas surveyed using single-beam sonar, the volume of material removed shall be calculated using the average end area method. The HYPACK software Philadelphia Pre Dredge and Post Dredge volume calculation method shall be used for all single-beam volume computations. All survey data used for volume computations shall be available to the Contractor upon request.

All plots of soundings provided to the Contractor during administration of this contract shall be a graphical representation only and shall not be used volume for calculations.

1.8 CONSTRUCTION TOLERANCES

1.8.1 Dredging Tolerances

Dredge equipment tolerances are specified in Part 2 Products. The finished dredge surface shall not deviate from the lines and grades shown by more than

the tolerances listed below. Tolerances are measured perpendicular to the indicated neatlines. Dredging shall meet the tolerances below at over 90% of the placement area as measured by bathymetric survey. Extreme limits of the tolerances given shall not be continuous for an area greater than 400 square feet.

NEATLINE TOLERANCES		
	ABOVE NEATLINE (inches)	BELOW NEATLINE (inches)
Environmental Dredge Target Elevation	0	6

1.8.2 Overdepth Dredging

To cover unavoidable inaccuracies of dredging processes, material actually removed to the dredging tolerance and within the dredging limits will be measured and paid for at full contract price. Any dredging below the allowed tolerance will be considered as excessive dredging and for which payment will not be made.

1.8.3 Side Slopes

Dredging on side slopes within the DMUs shall follow, as closely as practicable, the lines indicated or specified. An allowance for the specified dredging tolerances will be made for dredging beyond the indicated or specified side slopes, except as provided herein. Dredging for sides slopes outside the DMUs shall be minimized to the extent required for stable slopes.

1.8.4 Excessive Dredging

Materials taken from beyond the limits specified in Subparagraphs OVERDEPTH DREDGING and SIDE SLOPES, will be excluded from the computed total amount dredged as excessive channel dredging or excessive side slope dredging and for which payment will not be made. The final determination of the amounts of excessive dredging will be based wholly on the surveys made for final examination and acceptance. See Paragraph entitled FINAL EXAMINATION AND ACCEPTANCE.

1.9 PERMIT

The Contractor shall comply with conditions and requirements of the Corps of Engineers Permit and other State or Federal permits. The Contracting Officer will secure the permit for dredging and disposal of material as indicated. The Contractor shall make arrangements with the City of Superior to access Wisconsin Point Landfill for disposal of dredged sediments and shall make arrangements with an appropriately licensed disposal facility for excess dredged sediments and debris.

1.10 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain during the life of the contract, environmental protective measures. Also, provide environmental protective measures required to correct conditions, such as oil spills or debris, that occur

during the dredging operations. Comply with Federal, State, and local regulations pertaining to water, air, and noise pollution.

1.11 GENERATED RESIDUALS BEST MANAGEMENT PRACTICES (BMPS)

Implement practices to limit the generation of residual contaminated sediment. Generated Residuals BMPs shall include, but are not limited to, the following operational procedures:

- a. Implement removal in a manner that ensures stable slopes along the exposed face of uncut areas inside the removal area boundary to minimize bank sloughing or failure.
- b. Conduct bulk removal of sediments in contiguous areas where the thickness of the cut to achieve the required elevations is greater than two times the bite depth of the bucket being used in that location.
- c. Implement removal of slope materials in a staircase fashion where the bucket bites proceed from the top of the slope to the bottom of the slope to minimize sloughing.
- d. Lower and raise the environmental bucket in a slow and controlled manner avoiding quick stops or changes in direction.
- e. Load scows evenly to maintain stability of the scow and do not overfill.

PART 2 PRODUCTS

2.1 SEDIMENT REMOVAL EQUIPMENT

Following their assessment of site conditions, Contractor shall determine the appropriate removal equipment for completion of the Work, and shall choose such equipment and any associated features to minimize, to the extent practical, generation of suspended sediments. This section assumes that mechanical removal will be performed using an environmental bucket. A clamshell bucket shall also be available to remove debris that cannot be removed with the environmental bucket. Equipment used for handling both impacted sediments and non-impacted materials (e.g., cover material) shall be decontaminated prior to handling non-impacted materials per the Contractor's Onsite Material Handling Plan prepared in accordance with Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL and Wisconsin DNR's Manual Code #9183.1.

2.1.1 Removal (Environmental) Bucket

All removal buckets must be equipped with monitoring capabilities to inform the operator if the bucket is not completely closed. Separate logs of closed and partially closed (i.e., held open by debris or other obstruction) buckets shall be reported by the real-time kinematics differential global positioning system (RTK DGPS). The removal bucket shall have a positioning tolerance of plus or minus 3 inches vertically and plus or minus 3 inches horizontally. The removal bucket shall be designed to maintain enclosure of sediments when the bucket is being raised through the water column; minimize, to the maximum extent practical, the generation of suspended sediments during bucket lowering, closing, and raising in the water column; and minimize the amount of water contained, in the removal bucket as it is closed. The bucket shall include features designed by the buckets' manufacturer that allow free water

overlying the sediment in the bucket to drain once the removal bucket has been raised above the water surface. The removal equipment shall be capable of making a flat cut to minimize the amount of non-target materials removed during removal. In addition, the removal equipment shall be designed to remove sediments at near in situ densities and minimize the amount of water contained in the removal bucket and placed within the scow.

2.1.2 Equipment Positioning Software

Removal shall be performed with equipment outfitted with RTK DGPS with the necessary sensors, to enable accurate positioning of the removal bucket. The information generated by the RTK DGPS shall be submitted upon request. A qualified positioning equipment technical support personnel shall be on the Project Site whenever removal activities take place. If GPS downtime is greater than 10 hours per week for work in the removal area, alternate positioning equipment systems must be provided with written approval from the Contracting Officer.

2.1.2.1 Capabilities:

The RTK DGPS shall be capable of:

- a. Inputting and presenting a removal prism file (an x, y, z file on a gridded interval of 1 foot by 1 foot).
- b. Recording all sensor information in standard ASCII format or other approved format to a hard disc so that the position and movements of the dredge can be reviewed at a later date (playback capability).
- c. Producing plots showing the location where each removal bucket closing (x,y,z) was attempted and if the bucket was closed.
- d. Showing the removal operator, in real-time, the depth of material as the bucket takes a bite in relation to the dredge target elevation.
- e. Using a true 3-dimensional computational system to calculate the position of the bucket taking into account the tilt and list of removal platform as well as standard positioning sensors.
- f. Show that the removal buckets positioning system's error budget is within the stated vertical and horizontal accuracies. The error budget shall include all errors associated with measuring the positioning of the bucket.

2.1.2.2 Verification:

The RTK DGPS employed shall be verified in the field prior to the scheduled use of equipment. The equipment verification can be completed on land or on water and shall demonstrate the ability to achieve, monitor, and report these tolerances. The Contracting Officer (or their representative) will be present for the operation and must approve the verification procedures. Procedures for verification shall be submitted for written approval in advance of field verification. On-land verifications are considered contingent and shall be re-verified once the equipment is on the water and before the equipment is used for removal. The Contractor must verify its error budget (i.e., quality control check of all positioning sensors to verify that individually and

together they operate within an error range that satisfies the error budget requirement) at least one time per day.

2.2 SCOWS

Scows used to transport dredged sediment shall be watertight; testing may be conducted to certify that the scows are watertight. Scows used to transport impacted material shall be decontaminated prior to transporting non-impacted material (e.g. cover fill). Decontamination shall be in accordance with the Contractor's Onsite Material Handling Plan prepared in accordance with Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL and Wisconsin DNR's Manual Code #9183.1. Scows shall be clearly numbered and labeled for identification purposes to help with reporting requirements. Provide and maintain markings on all material scows clearly indicating the draft of the scows. Each scow shall be used with an ullage table (i.e., displacement table) to provide required information regarding tonnage located in/on the scow. Provide and maintain sufficient spot or floodlights to permit the reading of the draft on the sides of material scows at bow and stern from the tow boat at night and when visibility is impaired. Ensure that adequate time is allowed by the tow boat captain for these readings to be obtained. These tonnage report logs shall be part of the daily progress report.

2.3 RESUSPENSION CONTROLS

2.3.1 Slip Entrance Resuspension Controls - Air Bubble Curtain

As required by WDNR memorandum dated November 2, 2018 entitled "Resuspension Performance Monitoring (i.e., Turbidity Requirements) for Sediment Remediation in Howards Bay, Superior, Wisconsin", Contractor shall design, install, operate, and maintain an air bubble curtain at the entrances to Fraser slip, Cummings Slip, and Hughitt slip. The air bubble curtain system shall include all necessary equipment and incidentals for operation of the air bubble curtain system, including but not limited to air compressors, supply lines, aeration pipes, and frame/anchoring. The air bubble curtain shall be designed by an experienced vendor/manufacturer taking into account the site conditions and meet the following performance requirements:

- a. Perforated pipes shall be arranged to allow for the full width the slip to be enclosed by bubbles for the full depth of the water column.
- b. The bottom perforated pipe shall be designed to ensure close proximity with the sediment surface without sinking into or clogging with sediment.
- c. Air system shall provide uniform bubble flux over the entire system and be adequate to contain suspended materials within the dredging area.
- d. Controls and meters shall be installed to monitor the performance of the system.
- e. The frame/anchoring shall be capable of maintaining the air bubble curtain at its installed location and shall not interfere with the creation of a uniform bubble curtain.
- f. The system shall allow for uninterrupted movement of vessels into and out of slips.

The Contractor test the air bubble curtain prior to the start of dredging to ensure a uniform curtain of bubbles is provided. Operation and effectiveness of the air bubble curtain system shall be documented in the Daily Report of Environmental Dredging Operations. Use of the air bubble curtain does not

relieve the Contractor from providing additional resuspension controls as necessary to meet the resuspension performance criteria.

2.3.2 Contingency Resuspension Controls

In-water controls such as turbidity curtains, sorbent booms, and sorbent pads may become necessary during construction to meet water quality performance standards defined in this Section and outlined in the WDNR memorandum dated November 2, 2018 entitled "Resuspension Performance Monitoring (i.e., Turbidity Requirements) for Sediment Remediation in Howards Bay, Superior, Wisconsin". An adequate supply of such materials shall be kept onsite at all times as a contingency measure.

2.3.2.1 Turbidity Curtain

Turbidity curtains shall be a pre-assembled system, including floatation mechanisms (or other approved installation techniques), full depth permeable geomembrane, bottom weights, securing/tie-off mechanism, and joining mechanism. Requirements for tie-down locations are site-specific dependent on the desired location of the ensuing containment, exterior currents, size of work area, etc. The installed system shall not scour sediment bed, scour of bridge abutments, or any other deteriorating effect on structures or facilities in the vicinity of the dredging Project area or the offloading platform facility in Howard Bay. Contractor shall design and install an anchoring system to properly secure the curtain system within the water body. Tie-down points not located on Government property shall be below the top of bank and above the ordinary high water level. Anchoring to non-government owned structures is strictly prohibited unless appropriate access agreement with structure owner is obtained. Contractor shall maintain the turbidity curtains until water on both sides of the control are visually equal and then remove the control.

2.3.2.2 Sorbent Booms and Pads

Contractor shall maintain a supply of sorbent mats/pads onsite for use in migration of oils/sheens and spill cleanup, as necessary.

2.4 TURBIDITY MONITORING SYSTEMS

2.4.1 Background Monitoring System

The background monitoring system shall be capable of continuous monitoring and shall consist of the following main components: data station, turbidity sensor, power source, submersible data logging system, telemetric data transmitter, and computer software. The system shall be capable of:

- a. Logging turbidity levels a minimum of every 10 minutes.
- b. Calculating 30 minute running averages.
- c. Transmitting readings a minimum of every 30 minutes to an online accessible database.
- d. Measuring turbidity at a resolution of +/- 1 NTU.

Equipment shall be maintained and calibrated in accordance with the manufacturer's recommendations.

2.4.2 Performance Turbidity Monitoring Equipment

Performance Turbidity Monitoring shall be performed using a manual turbidity meter equipped with probe(s) capable of collecting turbidity readings in NTUs

and depth in feet. The meter shall will be able to measure turbidity at a resolution of +/- 1 NTU. The manual turbidity meter shall be calibrated, operated, and maintained according to the manufacturer's instructions.

PART 3 EXECUTION

3.1 INSPECTION

Inspect the work, keep records of work performed, and ensure that gages, targets, ranges, and other markers are in place and usable for the intended purpose. The presence of the Contracting Officer shall not relieve the Contractor of its responsibility for the proper execution of the work in accordance with the specifications and Drawings. Furnish, at the request of the Contracting Officer, boats, boatmen, laborers, and materials necessary for inspecting, supervising, and surveying the work. When required, provide transportation for the Contracting Officer and inspectors from designated points on shore to and from the various places of off-shore dredging activities. Should the Contractor refuse, neglect, or delay compliance with these requirements, the specific facilities may be furnished and maintained by the Contracting Officer, and the cost thereof will be deducted from any amounts due or to become due the Contractor.

3.2 CONTRACTOR QUALITY CONTROL

The Contractor shall establish and maintain a QCS for dredging operations to assure compliance with the Contract requirements and provide a Daily Report of Environmental Dredging Operations by completing the appropriate form and completing all inspections of items under this system, including, but not limited to, the following:

- a. Layout of work and dredging areas.
- b. Proper dredging depths.
- c. Conveyance operations.
- d. Removal of misplaced material.
- e. Safety requirements.

3.3 CONDUCT OF DREDGING WORK

Fourteen (14) calendar days prior to environmental dredging being performed, the Contractor shall provide written Notice of Start of Environmental Dredging to the Contracting Officer. The Contractor shall perform all dredging work to remove material to the required depths within the limits shown on the Drawings and as specified. Any materials in the allowable overdepth prism and allowable side slopes are not required to be removed. Rocks, cobbles (3 to 12 inches) and boulders (over 12 inch) may be encountered near breakwaters, revetments and pier heads and shall not be removed if they are part of the harbor structures nor shall toe stones be undermined. Indicated required dredging areas within required downstream and upstream dredging limits may be revised by the Government, after performing the before dredging soundings. Dredging shall be performed to minimize suspended sediment. The Contractor may be required to suspend dredging at any time when for any reason turbidity is not adequately control to the levels required in paragraph TURBIDITY CONTROLS AND MONITORING.

3.3.1 Order of Work

The Contracting Officer will direct the Contractor on the order of work. The Government reserves the right to change the order of work at any time.

3.3.2 Equipment Disinfection Prior to Mobilization and Demobilization

All equipment mobilized to and demobilized from the site for dredging activities shall be disinfected to prevent the transport, introduction, or transfer of invasive species as required by Wisconsin Administrative Code NR 40.02(44). Best Management Practices (BMPs) for disinfecting equipment of invasive species can be found in Wisconsin DNR's Manual Code #9183.1 Boat, Gear and Equipment Decontamination and Disinfection Protocol, the Best Management Practices for Boat, Gear and Equipment Decontamination manual, and the supplemental information that can be found on the DNR's website at the following weblink <http://dnr.wi.gov/topic/Invasives/disinfection.html>.

3.3.3 Interference with Navigation

Minimize interference with the use of channels and passages.

3.3.4 Lights

Each night, between sunset and sunrise and during periods of restricted visibility, provide lights for installed structures (e.g., floating plants, pipelines, ranges, markers, turbidity curtain). Also, provide lights for buoys that could endanger or obstruct navigation. When night work is in progress, maintain lights from sunset to sunrise for the observation of dredging operations. Lighting shall conform to United States Coast Guard requirements for visibility and color.

3.3.5 Ranges, Gages, and Lines

Furnish, set, and maintain ranges, buoys, and markers needed to define the work and to facilitate inspection. Establish and maintain gages in locations observable from each part of the work so that the depth may be determined. Suspend dredging when the gages or ranges cannot be seen or followed. The Contracting Officer will furnish, upon request by the Contractor, survey lines, points, and elevations necessary for the setting of ranges, gages, and buoys.

3.3.6 Plant

Maintain the plant, scows, coamings, barges, and associated equipment to meet the requirements of the work. Promptly repair leaks or breaks and remove dredged material placed due to leaks and breaks.

3.3.7 Condition of Scows, Hoppers, and Pipelines

All scows and hoppers used for transporting the dredged material shall be kept in good condition with coamings in repair. Decks of vessels shall be cleaned of dredged material before leaving the dredging area.

3.3.8 Loading and Unloading of Scows

Load and unload scows using methods that do not create an unsafe situation or a situation causing spillage or submergence (tipping) of the scow. Load scows evenly to maintain stability of the scow. During loading operations, measure and record on the daily progress report the tonnage of each scow on an hourly basis and also report tonnage upon departure from the dredge area and upon arrival at the offloading area. Prior to unloading scows, pump out free water for treatment in accordance with Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Once movement of the dredge bucket toward the scow begins, the dredge shall maintain continuous movement of the bucket toward the scow until the dredged material is loaded in the scow; except where scow stability is a concern, where otherwise noted, or where otherwise directed by the Contracting Officer. Conduct dredging and scow loading operations in a manner to optimize the quantity of sediment in the scow while maintaining scow stability and integrity. Do not overload scows.

3.3.9 Disposal of Dredged Materials

Provide for safe transportation and disposal of dredged materials. Transport dredged materials to the upland processing area for processing in accordance with SECTION 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. The deposit of dredged materials in unauthorized places is forbidden. Comply with rules and regulations of state and federal governments and local port and harbor governing authorities.

3.3.9.1 Method of Disposal

Dredged materials shall be processed and placed at the Wisconsin Point Landfill in accordance with Section 02 66 00 SELECT FILL AND TOPSOIL FOR LANDFILL COVER and Section 02 61 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS. The Contractor shall provide its own equipment for placement at Wisconsin Point Landfill. Dredged materials identified for off-site disposal and materials in excess of the placement volume at Wisconsin Point Landfill will be disposed of at a permitted disposal facility in accordance with Section 02 61 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS.

3.3.10 Navigation Warnings

Furnish and maintain navigation warning signs along installed project structures or equipment (e.g., turbidity curtain).

3.3.11 Method of Communication

Provide a system of communication between the dredge crew and the crew at the processing area. A portable two-way radio is acceptable.

3.3.12 Salvaged Material

anchors, chains, firearms, and other articles of value, which are brought to the surface during dredging operations, shall be decontaminated and disposed offsite as appropriate based on type of material. Material handling, transportation, and disposal shall be in accordance with Section 02 61 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS and all local, state, and federal requirements. .

3.3.13 Safety of Structures

The prosecution of work shall ensure the stability of piers, bulkheads, and other structures lying on or adjacent to the site of the work, insofar as structures may be jeopardized by dredging operations. Repair damage resulting from dredging operations, insofar as such damage may be caused by variation in locations or depth of dredging, or both, from that indicated or permitted under the contract.

3.3.14 Plant Removal

Upon completion of the dredging activities, promptly decontaminate and remove plant, including ranges, buoys, piles, turbidity curtain (if used), and other markers or obstructions.

3.4 MEASUREMENT

The material removed will be measured in cubic yards in place, by means of soundings taken before and after dredging. Prior and after surveys will be made by sonic sounding methods. The Government will make prior and after surveys and may make check surveys. Additional soundings will be taken as the Contracting Officer may deem necessary. Only one (1) prior survey will be made for work required by the Government. If additional prior surveys are required, due to the Contractor's operations, the cost of such surveys shall be paid by the Contractor. The cost of such surveys shall be the same as specified in the Paragraph entitled, "FINAL EXAMINATION AND ACCEPTANCE."

3.4.1 Method of Measurement

Hydrographic Surveys will be conducted to meet USACE Performance Standards as defined in the Hydrographic Surveying Manual EM 1110-2-1003. Surveys will be performed by multi-beam sweep type surveys and/or by single beam sounding equipment. The multi-beam sonar and the single beam sonar will be calibrated following procedures outlined in the aforementioned EM. The same equipment shall be used for priors and after surveys, using the same work platform.

3.4.2 Government Utilization of Multi-beam and Single Beam Sounders for Quantity and Clearance Surveys

The Government may elect to use either Multi-beam or Single beam sounding surveys.

3.4.3 Surveys During Progress of Work

Dredging progress shall be determined by dredge equipment positioning system as work progresses. The Contractor shall record dredging progress and report in the daily dredge reports.

3.4.3 Monthly Estimates

Monthly estimates of work completed will be based on the result of soundings taken during the progress of the work. Deductions will be made for dredging and disposal not in accordance with the specifications.

3.5 TESTS AND INSPECTIONS

3.5.1 Quality Control Measures

Establish and maintain quality control for all work performed at the job site under this section to assure compliance with contract requirements. Maintain records of the quality control tests, inspections and corrective actions. Quality control measures shall cover all construction operations including, but not limited to, the removal of impacted sediment to the grade lines shown and in accordance with this section.

3.5.2 Turbidity Controls and Monitoring

Contractor shall control turbidity through a combination of best management practices including operational controls and physical measures. Contractor shall maintain a supply of contingency resuspension control measures and oil boom on site, for emergency use in the event of resuspension control measures failure, visible sheen, or exceedance of resuspension performance standards. Turbidity Monitoring will be performed by the Contractor during dredging and cover placement activities as described herein. Physical controls shall be operated and maintained to meet resuspension performance standards and shall only be removed after completion of work and once conditions on the work side of the controls are similar to the non-work side.

As required by WDNR memorandum dated November 2, 2018 entitled "Resuspension Performance Monitoring (i.e., Turbidity Requirements) for Sediment Remediation in Howards Bay, Superior, Wisconsin", Contractor shall design, install, and maintain bubble curtains at the entrance to the slips during dredging and supplement with additional controls as necessary to achieve resuspension performance standards.

3.5.2.1 Background Turbidity Monitoring

Background turbidity data will be collected from a location positioned outside of the study area near the confluence of Howards Bay and the St. Louis River (approximately 500 feet beyond the I-535/Blatnik Bridge along the north shore). Contractor shall provide a background turbidity monitoring system capable of continuously monitoring turbidity and that allows for remote data retrieval. Background turbidity data may be supplemented using St. Louis River data collected by others Bong (Highway 2) and/or Blatnick bridge crossings.

3.5.2.2 Performance Turbidity Monitoring

3.5.2.2.1 Monitoring Frequency

Perform turbidity monitoring at least twice per day, in the middle of each shift with active work. Additional monitoring will be performed every 30 minutes if the Turbidity Warning Level is exceeded as required below.

3.5.2.2.2 Location

Perform monitoring at the project site boundary (see Drawings) and within 150 feet of active dredging and/or cover placement operations. Perform supplemental monitoring at locations directed by the Contracting Officer.

3.5.2.2.3 Equipment and Methodology

Performance monitoring shall be conducted manually with real-time meters. Readings shall be collected from three depths within the water column at each

the sampling location (1/3 depth of water column, mid-depth of the water column, and 2/3 depth of water column).

3.5.2.3 Turbidity Results Evaluation

An average value of spatially-integrated readings obtained from each performance monitoring locations will be compared against the background location reading at that time. An example table for performing evaluation is provided below:

[A] Location	[B] Time	[C] Total Water Depth, ft	[D] Depth Below Water Surface, ft	[E] Turbidity Reading, NTU	[F] Average Turbidity, NTU	[G] Background Turbidity, NTU	[H] Compliance Value, NTU [F-G]
Site Boundary			[C] ÷3 =				
			[C] ÷2 =				
			[C] x2/3=				
Work Area			[C] ÷3 =				
			[C]÷2 =				
			[C] x2/3=				

3.5.2.4 Turbidity Compliance Limits

Contractor shall control turbidity to below the following limits:

Warning Level: greater than 65 nephelometric turbidity units (NTUs) above background (mouth of Howards Bay) levels

Action Level: greater than 87 nephelometric turbidity units (NTUs) above background (mouth of Howards Bay) levels

Not to Exceed (NTE) Level: greater than 110 NTUs above background (mouth of Howards Bay) levels

Contractor shall immediately notify the Contracting Officer in the event of an exceedance of the above compliance limits.

3.5.2.5 Turbidity Corrective Measures

If the warning level is exceeded, manual monitoring shall be increased to a frequency of every 30 minutes. If two consecutive 30-minute measurements exceed the warning level, the Contractor shall evaluate conditions and implement any necessary measures to prevent turbidity levels from reaching the action level at a performance monitoring location. Measures may include reducing production rate and implementing additional BMPs.

If monitoring indicates exceedance of the Action Level for 30 minutes, Contractor shall evaluate conditions and cause for exceedance.

If the increase in turbidity above the action level is due to non-project influences such as stormwater runoff or prop wash by non-project-related vessel traffic, and the COR concurs, then work can continue.

If the turbidity increase above the action level is due to dredging or cover placement activities, then production rates and BMP effectiveness shall be re-evaluated and corrective measures taken to mitigate turbidity levels. Corrective measures may include repairing or replacing existing controls, installing additional controls, or modifying work practices.

If monitoring indicates exceedance of the NTE Level, all in-water work shall stop and the increase in turbidity evaluated. Contractor shall implement necessary corrective measures. Work shall not resume until corrective measures are taken, turbidity reading drop below the NTE for 30 minutes and COR has been notified. COR will notify agencies of the exceedance.

3.5.2.6 Turbidity Reporting and Documentation

Results of turbidity monitoring shall be included in the Daily CQC Reports prepared in accordance with SECTION 01 45 00.00 10 QUALITY CONTROL. In the event of an exceedance of the action level, Contractor shall include the time, location, and level of the exceedance and the identified cause of the exceedance and any corrective measures taken.

3.5.3 Check Surveys

Surveys and/or equipment positioning system reports made by the Contractor are required for determining that dredging is being performed to the dredge target elevations. Make checks as the work progresses to verify lines, grades and thicknesses established for completed work. Additional elevations and soundings shall be taken as the Contracting Officer may deem necessary or advisable.

3.5.4 Confirmation Sampling

Contractor shall perform confirmation sampling once all of the following conditions are met:

- a. Contracting Officer confirms target elevations have been met in the DMU based on the Contractor-provided check survey/equipment positioning system reports.
- b. First Dredging Pass of DMU completed at least 24 hours prior to sampling of that DMU.
- c. No dredging or cover placement has occurred in the previous 24 hours within 150 feet of the DMU to be sampled.

Contractor shall notify the Contracting Officer at least 1 business day in advance of sample collection in each DMU to allow for scheduling of sampling oversight. Contractor shall perform confirmation sampling in accordance with this Section.

3.5.4.1 Confirmation Sample Collection

Confirmation samples will be collected to refusal or underlying native clay at the locations shown on the Drawings or as directed by the Contracting Officer in the field based on field observations, check survey result, and field observations. Locations of samples shall be recorded in the field and documented by the Contractor on the as-built drawings.

Confirmation samples shall be collected by vibracoring using the procedures documented in USEPA's Standard Operating Procedure for Using the Vibracoring System On Board the Research Vessel Mudpuppy II (USEPA 2010) as supplemented below.

1. Record the following in a field book for each vibracore attempt:
 - a. Date
 - b. Time of recovery
 - c. Sample position

- d. Water depth (feet)
- e. Core penetration depth (feet)
- f. Core recovery length
- g. Observations made during vibracore attempt (e.g., sheens, etc.)
2. Once the core is removed from the vibracoring measure the recovered length of the sediment core and label the core tube with the following:
 - a. Location ID
 - b. Recover Attempt
 - c. Date and time of core recovery
 - d. "up" arrow
3. Compare the recovered core length with the core penetration depth.
 - a. If the recovered core length is more than 75 percent of the penetration depth, keep the core and continue with SAMPLE PROCESSING.
 - b. If less than 75 percent recovery retain the core and proceed as follows:
 1. Reposition the second attempt target away from the original target location as directed by Contracting Officer and follow vibracoring standard procedures listed above.
 - Note it may be helpful to use a rod to probe the sediment surface to evaluate the sediment thickness and presence of debris or obstructions prior to establishing the relocated target positions.
 2. If refusal or inadequate recovery occurs during the second attempt, retain core, and reposition the third attempt target from the second attempt target as directed by Contracting Officer and follow vibracoring standard procedures listed above.
 - c. If after three attempts the target penetration depth or the minimum recovery length cannot be achieved, the core with the maximum recovery among the three attempts will be retained for processing.
 - d. Record in the field book which attempt is retained for sampling and that target penetration and/or minimum recovery was not achieved through three attempts for the sample location.

Store cores vertically while on the vessel and transport to the processing area and until sample processing is initiated on the core.

3.5.4.2 Confirmation Sample Core Processing

Cores will be processed on shore in a designated processing area as follows:

1. Cut open Lexan core liners, if used, using electric shears logging and processing.
2. Photo-document the entire length of each core to provide reference for post-processing questions regarding descriptions of color/staining, general texture, recovery, etc. Photos of the core will include a view of a dry-erase board marked with the core ID, depth interval and date shown in the photo. The photo will also include a view of a tape measure for scale.
3. Log sediment cores using the unified soil classification system (USCS).
4. Collect samples for laboratory analysis as follows:
 - a. Segment the core in subsample depth intervals as follows: top 0-6 inches of sediment and each successive 12-inch interval.
 - b. Homogenize samples within the required subsample depth intervals in a disposable aluminum pan with a stainless steel mixing spoon until the sediment is of uniform color.
 - c. Fill a pre-cleaned, laboratory-supplied sample jar with sample.
 - i. Perform split samples as directed by the COR. Provide filled jars with split samples to the COR.

- d. Fill out label and chain-of-custody form.
 - i. Samples will be labeled using the convention "HB" for Howards Bay, the sample year (YY-), the numeric location ID (###-), and "CS" for confirmation sample. For example, HB19-003-CS represents Howards Bay 2019 location 003 and was collected as part of the confirmation sampling program.
- e. Pack and store appropriately for transport to laboratory. Samples shall be stored on ice.

Excess sediment generated through vibracoring activities shall be managed with dredged sediment in accordance with Section 02 61 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS. PPE, soiled disposable items, core tube liners, and other trash shall be disposed with general site refuse.

3.5.4.3 Confirmation Sample Analysis

Submit confirmation samples to the laboratory on rapid (24 hr) turn-around time for contaminant of concern analysis as follows:

Chemical Parameter	Method	Action Level
Total Organic Carbon	Lloyd Jahn/ EPA SW-846 9060	Not applicable
Total PAHs	EPA SW-846 8270	12.205 mg/kg-TOC%
Tributyltin	TA SOP No. BR-GC-008	0.00173 mg/kg-TOC%
Lead	EPA SW-846 7470	83 mg/kg
Mercury	EPA SW-846 6010	0.64 mg/kg

Laboratory shall copy the Contracting Officer on the analytical testing results reports submitted to the Contractor.

3.5.4.4 Confirmation Sample Result Evaluation

Based on the results of the confirmation sampling the Contracting Officer will direct additional dredging in accordance with this section, placement of a residual cover in accordance with Section 35 20 24 PLACEMENT OF COVER MATERIAL, or no further action consistent with the Howards Bay Dredge Completion Decision Tree provided in Attachment A. Contractor shall allow at least 2 business days between receipt of results by the Contracting Officer from the laboratory and determination by Contracting Officer of next actions in a DMU. Locations of samples shall be recorded in the field and documented by the Contractor on the as-built drawings.

Re-dredging will be limited to one re-dredging event to the deeper dredge target elevation specified by the Contracting Officer. Revision to the dredge target elevation will be documented with revised drawings showing adjusted elevation prior to re-dredging. Re-dredging will be performed in accordance with this Section. Dredging and removal tolerances apply to the revised dredging target elevations.

3.6 FINAL EXAMINATION AND ACCEPTANCE

3.6.1 Examination

As soon as practicable after the completion of the entire work or any section thereof as in the opinion of the Contracting Officer will not be subject to damage by further operations under the contract, such work will be thoroughly

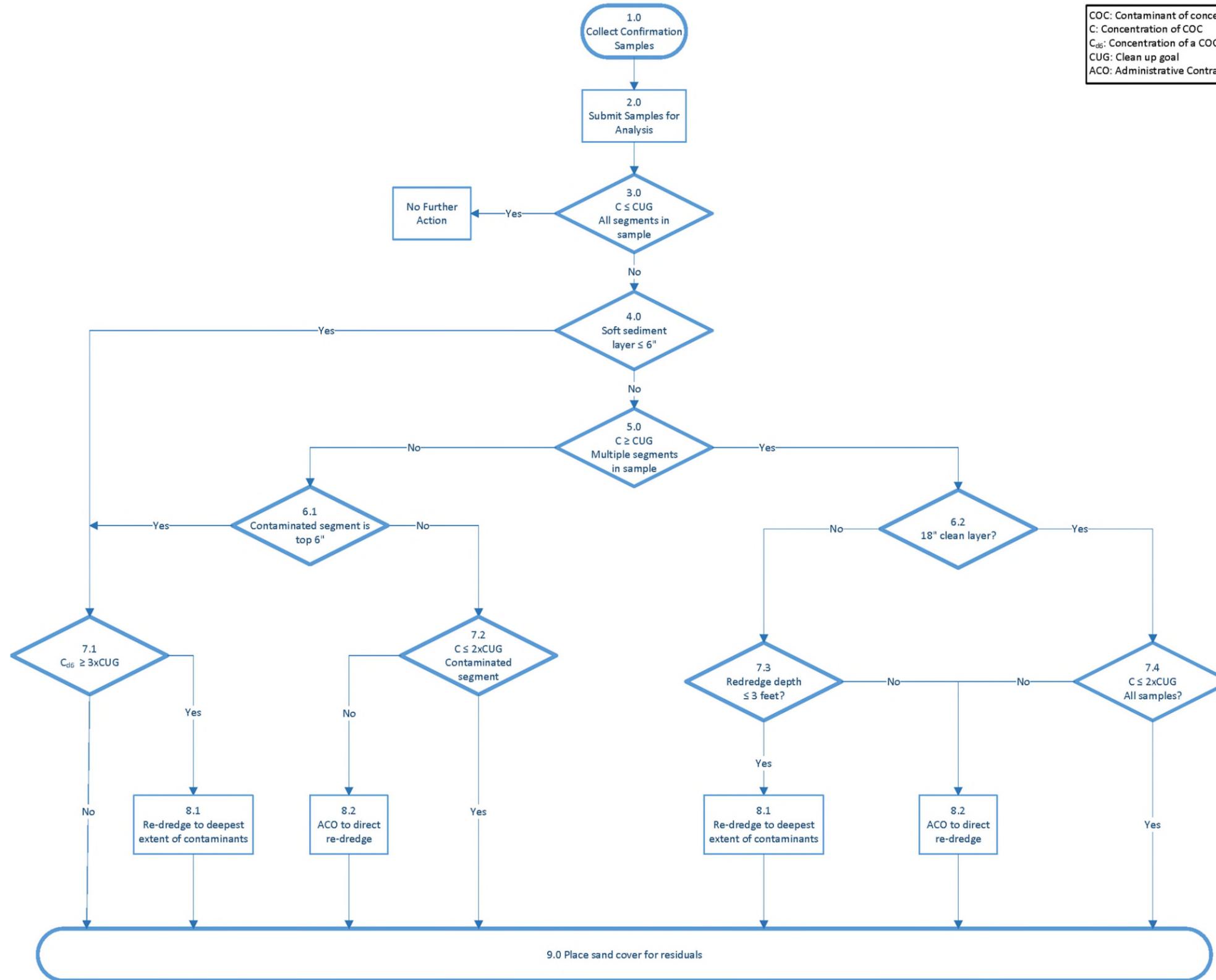
examined at the cost and expense of the Government by sounding or by sweeping, or both, as determined by the Contracting Officer. Should any shoals, slides or other lack of contract depth be disclosed by this examination, the Contractor is required to remove same by dredging at the contract rate for dredging, but if the bottom is soft and the shoal areas are small and form no material obstruction to navigation, the removal of such shoals may be waived at the discretion of the Contracting Officer. The Contractor or its authorized representative will be notified when soundings and/or sweepings are to be made, and will be permitted to accompany the survey party. When the area is found to be in a satisfactory condition, it will be accepted finally. Should more than two (2) sounding or sweeping operations by the Government over an area be necessary by reason of work for the removal of shoals disclosed at a prior sounding or sweeping, the cost of such third and any subsequent sounding or sweeping operations will be charged against the Contractor at the rate of \$3,500 per calendar day in which the Government plant is engaged in sounding or sweeping and/or is enroute to or from the site or held at or near the said site for such operations.

3.6.2 Acceptance

Final acceptance of the whole or part of the work and the deductions or corrections of deductions made thereon will not be reopened after having once been made, except on evidence of collusion, fraud, or obvious error, and the acceptance of a completed section shall not change the time of payment of the retained percentages of the whole or any part of the work.

Attachment A: Howards Bay Dredge Completion Decision Tree

COC: Contaminant of concern
C: Concentration of COC
 C_{06} : Concentration of a COC in the top 6" of core sample
CUG: Clean up goal
ACO: Administrative Contracting Officer



- 1.0 – Collect samples in accordance with approved Confirmation Sampling Plan Submittal (Section 35 20 23.53, Paragraph "Confirmation Sampling")
- 2.0 – Submit samples for analysis in accordance with approved Confirmation Sampling Plan (Section 35 20 23.53)
- 3.0 – Are the contaminant of concern concentrations below the clean up goal for every segment in the core sample?
- 4.0 – Is the thickness of the top layer of soft sediment (sediment other than native clay) less than or equal to six inches measured from the surface?
- 5.0 – Does more than one segment in the sample have contaminant of concern concentrations exceeding the clean up goal?
- 6.1 – Is the top six inch segment of the sample where contaminant of concern concentrations exceed the clean up goal?
- 6.2 – Is there at least 18 inches of clean material on top of the segments where the contaminant of concern concentrations exceed the clean up goal?
- 7.1 – Do the contaminant of concern concentrations exceed three times the clean up goal in the top six inches of the core sample?
- 7.2 – Is the concentration of the contaminated segment less than or equal to two times the clean up goal?
- 7.3 – Would it require three or less feet of re-dredging to reach bottom of the contaminated segment?
- 7.4 – Are the concentrations of the contaminated segments less than or equal to two times the clean up goal?
- 8.1 – Re-dredge the area represented by the confirmation sample to the bottom elevation of the deepest segment with contaminant of concern concentrations above the clean up goal. Re-dredging must be performed in accordance with Section 35 20 23.53
- 8.2 – Re-dredge the area represented by the confirmation sample to a target elevation as directed by the Administrative Contracting Officer. Re-dredging must be performed in accordance with Section 35 20 23.53.
- 9.0: Place sand cover in each area in accordance with the contract drawings and specifications. Sand cover must not be placed until dredging is complete in adjacent dredge management units (including any necessary re-dredge).

SECTION 35 20 24

PLACEMENT OF SEDIMENT COVER MATERIAL
01/17

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C136/C136M (2014) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 1110-2-1003 (November 30, 2013) Hydrographic Surveying

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA SW-846 (Update V) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods
Wisconsin Department of Natural Resources

Manual Code #9183.1 (June 16, 2016) Boat, Gear, and Equipment Decontamination and Disinfection Protocol (and supplemental information on DNR's website at the following weblink <http://dnr.wi.gov/topic/Invasives/disinfection.html>)

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Cover Placement Plan; G-AOF

At least 30 days prior to cover placement, submit plans of the placement operations to include the proposed equipment and methods to be used during placement operations. Schedule shall show cover placement being completed in DMUs during the same season environmental dredging is started in the DMU.

Cover Placement Safety Plan; G-AOF

Prior to commencing work at the placement area, describe in detail the means and methods to be utilized to provide for the public safety at the placement area, all in accordance with the Accident Prevention Plan.

SD-03 Product Data

Cover Material

SD-06 Test Reports

Daily Report of Operations

Gradation Test

Analytical Testing

1.3 SEQUENCING AND SCHEDULING

1.3.1 Placement Sequence

Placement shall begin at the deepest point of each cover area and progress to shallower elevations. Cover placement must be completed in the same season as environmental dredging is started in a DMU.

1.3.2 Delivery of Plant and Order of Work

At least 30 days prior to start of placement work, the Contractor shall submit a Cover Placement Plan describing the proposed methods for accomplishing the work. Unless otherwise directed by the Contracting Officer, the Contractor shall accomplish the required work within the time established in the contract documents.

1.4 EXISTING SOUNDINGS OF PLACEMENT AREAS

The Drawings represent the conditions existing at the time of survey.

1.5 QUALITY ASSURANCE

1.5.1 Cover Material

Submit suitable quality assurance test results for cover material prior to delivery of any such material to the worksite.

1.5.1.1 General

All cover material shall be durable material as approved by the Contracting Officer. Provide quality test data for each material source. The cover material shall be clean and adequately free from all foreign matter. Any foreign material combined with the cover material as a result of stockpiling shall be removed prior to placement.

1.5.1.2 Sources

Cover material shall be furnished from a source designated by the Contractor and accepted by the Contracting Officer, subject to the conditions herein stated. The Government may conduct a quarry investigation and evaluate the

quality test data provided by the Contractor to determine whether acceptable cover material can be produced from the proposed source.

a. Selection of Source. Designate in writing one source or one combination of sources from which the Contractor proposes to furnish cover material at least 60 workdays before the material leaves the quarry. It is the Contractor's responsibility to determine that the source or combination of sources selected is capable of providing the quality, quantities and gradation needed and at the rate needed to maintain the scheduled progress of the work. Testing results shall be provided in accordance with paragraph EVALUATION TESTING OF COVER MATERIAL. If a source for cover material so designated by the Contractor is not accepted for use by the Contracting Officer, the Contractor shall identify an alternate source.

b. Acceptance of Materials. During the contract period, both prior to and after materials are delivered to the job site, visual inspections and measurements of the materials may be performed by the Contracting Officer. If the Contracting Officer, during the inspections, finds that the quality, gradation or weights of material being furnished are not as specified or are questionable, re-sampling and re-testing is required. Sampling of the delivered material for testing and the manner in which the testing is to be performed shall be as directed by the Contracting Officer. This additional sampling and testing shall be performed at the Contractor's expense when test results indicate that the materials do not meet specified requirements. When test results indicate that materials meet specified requirements, an equitable adjustment in the contract price will be made for the sampling and testing. Any material rejected shall be removed or disposed of as specified and at the Contractor's expense.

1.5.1.3 Evaluation Testing of Cover Material

Quality testing of the cover material in accordance with PART 2 paragraph EVALUATION TESTING OF COVER MATERIAL is the responsibility of the Contractor. The tests to which the cover material may be subjected will include chemical analysis, gradation and such other tests as may be considered necessary to demonstrate that the cover material is of a satisfactory quality. Submit a copy of the laboratory inspection report along with actions taken to correct deficiencies and a copy of the test reports, prior to delivery of such material to the worksite.

1.6 PERMIT

Contractor shall comply with conditions and requirements of the Corps of Engineers Permit and other State or Federal permits. The Contracting Officer will secure the permit for dredging and material placement as indicated.

1.7 CONSTRUCTION TOLERANCES

1.7.1 General

The intention is that the work shall be built generally to the required elevations, slope and grade and that the final surfaces shall be even and present a neat appearance. Placed material not meeting these limits shall be removed or reworked as directed by the Contracting Officer at no additional

cost to the Government. Payment will not be made for excess material which the Contracting Officer permits to remain in place.

1.7.2 Vertical Placement Tolerances

The finished cover surface thickness shall not deviate from the lines and grades shown by more than the tolerances listed below. Tolerances are measured perpendicular to the indicated design surface for cover placement. Materials placed shall meet the tolerance below at 100% of the placement area as measured by bathymetric survey. Extreme limits of the upper tolerance given shall not be continuous for an area greater than 400 square feet.

VERTICAL PLACEMENT TOLERANCES		
MATERIAL	ABOVE DESIGN SURFACE (inches)	BELOW DESIGN SURFACE (inches)
Cover Material	3	0

1.7.3 Horizontal Placement Tolerances

All horizontal limits specified in the Drawings are allowed to vary by +1.0 to 0.0 feet.

1.7.4 Placed Material Side Slopes

Placed material side slopes shall not be steeper than 3:1 (horizontal : vertical). See Drawings for typical assumed side slope geometry and angles.

1.8 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain during the life of the contract, environmental protective measures. Also, provide environmental protective measures required to correct conditions, such as oil spills or debris, that occur during the dredging operations. Comply with Federal, State, and local regulations pertaining to water, air, and noise pollution.

PART 2 PRODUCTS

2.1 COVER MATERIAL

2.1.1 General

Cover material shall be obtained from offsite sources approved by the Contracting Officer. Submit certificates of compliance attesting that the materials meet specification requirements. Do not use material for backfill until borrow source chemical and physical test results have been submitted and approved.

2.1.2 Gradation Test

Cover material shall consist of Sand "Cover Material." The cover material shall be composed of tough, durable particles, adequately free from thin, flat and elongated pieces, and shall be free from debris or other deleterious substances, foreign objects such as frozen material, coal, wood, hay, burlap, paper, plastics, tree roots, pieces of concrete or pavement or contaminants (chemical and/or biological). Grading shall conform to the following requirements:

U.S. STANDARD SIEVE	PERMISSIBLE LIMITS PERCENT BY WEIGHT, PASSING
SAND "Cover Material"	
3/8 in.	100
No. 4	90-100
No. 16	45-85
No. 50	5-30
No. 100	0-10
No. 200	0-1

The cover material shall be well-graded between the limits shown. At least one test shall be performed on each 1000 cubic yards placed from a quarry/commercial source and 500 cubic yards placed from a noncommercial source. Gradation testing shall be performed in accordance with ASTM C136/C136M. All points on individual grading curves obtained from representative samples of cover material shall lie between the boundary limits as defined by smooth curves drawn through the tabulated gradation limits plotted on ENG FORM 2087 or similar form. The individual gradation curves within these limits shall not exhibit abrupt changes in slope denoting either gap grading or scalping of certain sizes or other irregularities.

2.1.3 Analytical Testing of Cover Material

Perform analytical tests on cover material collected from the proposed source. Analytical testing shall be performed once per 1,000 cubic yards from each quarry/commercial source and once per 500 cubic yards for noncommercial sources. Analytical testing shall include:

Chemical Parameter	Method	Criteria
PAHs	EPA SW-846 8270	1.61 milligrams per kilogram (mg/kg) *
Mercury	EPA SW-846 7471	0.2 mg/kg
Lead	EPA SW-846 6010	36 mg/kg
Arsenic	EPA SW-846 6010	10 mg/kg
Cadmium	EPA SW-846 6010	1 mg/kg
Chromium	EPA SW-846 6010	43 mg/kg
Copper	EPA SW-846 6010	32 mg/kg
Nickel	EPA SW-846 6010	23 mg/kg
Zinc	EPA SW-846 6010	120 mg/kg

* Limit is sum of the following 16 PAH compounds: Acenaphthene; Acenaphthylene; Anthracene; Fluorene; Naphthalene; Phenanthrene; Benz(a)anthracene; Benzo(a)pyrene; Benzo(b)fluoranthene; Benzo(k)fluoranthene; Benzo(g,h,i)perylene; Chrysene; Dibenz(a,h)anthracene; Fluoranthene; Indeno(1,2,3-cd)pyrene; Pyrene.

Sampling and chemical analysis shall be conducted in accordance with Section 31 00 00 EARTHWORK. The cost of testing shall be borne by the Contractor.

2.1.4 Cover Material Stockpile

Storage of cover material at the worksite is not to be confused with off-site stockpiling of cover material. If the Contractor elects to provide off-site stockpiling areas, the Contracting Officer shall be notified of all such areas. After being stockpiled, any cover material which has become

contaminated with soil or refuse shall not be put into the work unless the contaminating material has been removed prior to placement.

a. Worksite Stockpile. Cover material delivered to the work sites, which requires temporary storage shall be placed in a sand-clay-gravel or crushed stone pad constructed for the staging area and removed upon completion of the work. The pad shall have a minimum thickness of at least 6 inches. The sand-clay-gravel or crushed stone pad method shall be subject to approval prior to delivery of the cover material. A sand-clay-gravel or crushed stone pad used to store cover material shall not have been used to previously stage impacted sediments. Upon completion of the work, the staging areas shall be cleaned of all storage residues and returned to their natural condition. Temporary storage of cover material at the worksite will be allowed, provided the stockpile toe is no closer than 100 linear feet from the closest edge water's top slope, and the amount shall not exceed 200 T unless otherwise approved.

b. Off-site Stockpile. In areas where cover is stockpiled for placement, the area shall have excess material removed prior to completion of work. Where material may have become buried due to soft ground or operation of the equipment, the material shall be disposed of as directed. After the material has been removed, the storage area shall be graded, dressed, and filled to return the ground surface as near as practical to the condition that existed prior to construction.

2.2 COVER PLACEMENT EQUIPMENT

Following their assessment of site conditions, Contractor shall determine the appropriate equipment for completion of the Work, and shall choose such equipment and any associated features to minimize, to the extent practical, generation of suspended sediments. This section assumes that mechanical placement will be performed using an environmental bucket. Alternate means and methods may be proposed by the Contractor in the Cover Placement Plan for review by Government; alternate means and methods shall be equally protective of water quality and not cause exceedance of water quality action levels. Placement equipment shall meet the requirements for Sediment Removal Equipment specified in Section 35 20 23.53 ENVIRONMENTAL DREDGING, including being outfitted with RTK DGPS. Equipment used for both dredging and cover activities shall be decontaminated per the Contractor's Onsite Material Handling Plan prepared in accordance with Section 02 61 13 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL and Wisconsin DNR's Manual Code #9183.1 prior to handling cover materials.

PART 3 EXECUTION

3.1 INSPECTION

Inspect the work, keep records of work performed, and ensure that gages, targets, ranges, and other markers are in place and usable for the intended purpose. Furnish, at the request of the Contracting Officer, boats, boatmen, laborers, and materials necessary for inspecting, supervising, and surveying the work. When required, provide transportation for the Contracting Officer and inspectors to and from the cover area and between the dredging plant and adjacent points on shore.

3.2 CONDUCT OF PLACEMENT WORK

3.2.1 Restriction

Placement of cover material is restricted to the areas shown in the Drawings unless otherwise directed by the Contracting Officer.

3.2.2 Lights

Each night, between sunset and sunrise and during periods of restricted visibility, provide lights for floating plants, pipelines, ranges, markers, and transfer station. Also, provide lights for buoys that could endanger or obstruct navigation. When night work is in progress, maintain lights from sunset to sunrise for the observation of dredging operations. Lighting shall conform to United States Coast Guard requirements for visibility and color.

3.2.3 Ranges, Gages, and Lines

Furnish, set, and maintain ranges, buoys, and markers needed to define the work and to facilitate inspection. Establish and maintain gages in locations observable from each part of the work so that the depth may be determined. Suspend placement when the gages or ranges cannot be seen or followed.

3.2.4 Equipment

All nautical vessels, pipelines and land based transport and conveyance systems for cover placement shall be operated, loaded and unloaded in such manner as to prevent overflow, spills, leaks, waste, or other loss of cover materials between point of pick-up and point of deposition within the cover area. Hauling vessels shall have sufficient sidewall height and integrity to prevent drainage over or through the sides and bottom during hauling. Maintain the plant, scows, coamings, barges, pipelines, and associated equipment to meet the requirements of the work. Promptly repair leaks or breaks and remove dredged material placed due to leaks and breaks.

3.2.4.2 Method of Placement

The method employed by the Contractor in conveying cover materials to the cover area shall be as described in the Cover Placement Plan approved by the Contracting Officer at all times. The quantities of all materials placed within an area shall be accurately tabulated and provided immediately to the Contracting Officer for comparison with computed quantities. Thickness of cover placement shall also be tracked with the equipment RTK DGPS and reported in the Daily Report of Operations. Temporary dumping or placement of materials outside of the cover area for subsequent re-handling into the placement area is prohibited unless otherwise approved by the Contracting Officer.

3.2.4.3 Misplaced Materials

Any material that is placed elsewhere than in the places designated in the Contract or approved by the Contracting Officer will not be paid for. If directed by the Contracting Officer, the Contractor shall be required to remove such misplaced material at its expense and deposit it in the place designated in this contract or approved by the Contracting Officer.

3.2.4.4 Condition of Scows, Hoppers, and Pipelines

All scows and hoppers used for transporting the dredged material shall be kept in good condition with coamings in repair. Decks of vessels shall be cleaned of cover material before leaving the cover area.

3.2.5 Loading and Unloading of Scows

Load and unload scows using methods that do not create an unsafe situation or a situation causing spillage or submergence (tipping) of the scow. Load scows evenly to maintain stability of the scow. Conduct scow loading and cover placement operations in a manner to optimize the quantity of cover material in the scow while maintaining scow stability and integrity.

3.2.6 Navigation Warnings

Furnish and maintain navigation warning signs around the project limits and on any structures/equipment immediately outside the project limits.

3.2.7 Equipment Removal

Upon completion of the work, clean and promptly remove cover placement equipment, buoys, piles, and other markers or obstruction.

3.3 PLACEMENT OF ENHANCED NATURAL RECOVERY (ENR) COVER

3.3.1 General

ENR cover composed of a 6 inch layer of sand shall be placed in one lift on the existing sediment surface, in accordance with the details shown on the Drawings, and within the limits shown on the Drawings. Prior to placement of cover material, the Contractor will submit a Cover Placement Safety Plan, describing in detail the means and methods to be utilized to provide for the public safety at the placement area.

3.3.2 Debris Removal

Any timbers, unsatisfactory material and debris within the cover area shall be removed except as otherwise directed by the Contracting Officer, and upon removal shall become the property of the Contractor. All materials shall be properly disposed of in accordance with the requirements of Section 02 61 14 TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS, including any applicable local requirements.

3.3.3 Placement of ENR Cover Material on Existing Sediment

Cover material shall be placed uniformly on the existing sediments to the lines and grades as indicated on the Drawings and in such manner as to minimize the displacement of existing sediments during placement operations. Dredging or any excavation of existing sediments at the cover area for the purposes of access for contractor equipment is prohibited. Placement shall begin at the bottom of the area to be covered and continue up slope. Subsequent loads of material shall be placed against previously placed material in such a manner as to ensure a relatively homogenous mass. Placing of sand by methods which tend to segregate the particle sizes within the cover material or cause mixing of the separate layers will not be permitted. Compaction of material placed will not be required, but the layer shall be finished to present an adequately even surface, free from mounds or windrows.

3.3.4 Slides

In the event of the sliding or failure of any part of the cover during its construction, or after its completion, but prior to its acceptance, upon written order of the Contracting Officer, restore the area of the slide with new materials or reuse the displaced materials for rebuilding if deemed appropriate. The Contracting Officer shall determine the nature and cause of the slide. In case the slide is caused through fault of the Contractor, the foregoing operations shall be performed without cost to the Government.

3.4 PLACEMENT OF RESIDUAL COVER

3.4.1 General

Residual cover composed sand shall be placed on dredged sediment surface as directed by the Contracting Officer, as described below, and in accordance with the details shown on the Drawings. Residual cover shall be placed within the limits and to the thickness identified in the field based on confirmation sampling results. Prior to placement of cover material, the Contractor will submit a Cover Placement Safety Plan, describing in detail the means and methods to be utilized to provide for the public safety at the placement area.

3.4.2 Placement of Residual Cover Material

Cover material shall be placed uniformly in one lift on the existing sediments at the dredge surface and shall be placed to the extent and thickness indicated by the Contracting Officer. Residual cover is anticipated to be a minimum of 6 inches. Residual cover shall not be placed until dredging is complete in adjacent dredge management units. Material shall be placed in such manner as to minimize the displacement of existing sediments during placement operations. Dredging or any excavation of existing sediments at the cover area for the purposes of access for contractor equipment is prohibited. Placement shall begin at the bottom of the area to be covered and continue up slope. Subsequent loads of material shall be placed against previously placed material in such a manner as to ensure a relatively homogenous mass. Placing of sand by methods which tend to segregate the particle sizes within the cover material or cause mixing of the separate layers will not be permitted. Compaction of material placed will not be required, but the layer shall be finished to present an adequately even surface, free from mounds or windrows.

3.4.3 Slides

In the event of the sliding or failure of any part of the cover during its construction, or after its completion, but prior to its acceptance, upon written order of the Contracting Officer, restore the area of the slide with new materials or reuse the displaced materials for rebuilding if deemed appropriate. The Contracting Officer shall determine the nature and cause of the slide. In case the slide is caused through fault of the Contractor, the foregoing operations shall be performed without cost to the Government.

3.5 CONTRACTOR QUALITY CONTROL

The Contractor shall establish and maintain a quality control system (QCS) for placement operations to assure compliance with the Contract requirements and provide a Daily Report of Operations by completing the appropriate form

and completing all inspections of items under this system, including, but not limited to, the following:

- a. Layout of work and cover areas.
- b. Proper cover thicknesses and boundaries.
- c. Conveyance and placement operations.
- d. Removal of misplaced material as directed by the Contracting Officer.
- e. Safety requirements.

3.5.1 Material Quality

Before selecting a source for cover material, provide documentation that the source meets the quality and source requirements specified in paragraphs SOURCES and EVALUATION TESTING OF COVER MATERIAL, including their respective subparagraphs.

3.5.2 Turbidity Controls

Contractor shall control turbidity during cover placement in accordance with Section 35 20 23.53 ENVIRONMENTAL DREDGING, paragraph TURBIDITY CONTROLS AND MONITORING. Contractor shall control turbidity through a combination of best management practices including operational controls and physical measures. Contractor shall maintain a supply of contingency resuspension control measures and oil boom on site, for emergency use in the event of resuspension control measures failure, visible sheen, or exceedance of resuspension performance standards.

3.5.3 Placement Control

3.5.3.1 Quality Control Measures

Establish and maintain quality control for all work performed at the job site under this section to assure compliance with contract requirements. Maintain records of the quality control tests, inspections and corrective actions. Quality control measures shall cover all construction operations including, but not limited to, the placement of cover materials to the slope and grade lines shown and in accordance with this section.

3.5.3.2 Check Surveys

Surveys made by the Contractor are required on cover materials placed for determining that the materials are acceptably placed in each cover area. Make checks as the work progresses to verify lines, grades and thicknesses established for completed work.

3.5.3.3 Placement Cores

Following placement, Contractor shall collect a minimum of one core per 3,600 square feet of contiguous cover area as directed by the Contracting Officer to confirm that the required cover thickness has been achieved. Placement core collection shall be conducted in the presence of an authorized representative of the Contracting Officer. The total applied thickness of cover will be

determined by the Contracting Officer's authorized representative based on visual observation of the collected cores. The clean (unmixed) cover thickness shall be at least 4 inches and the total applied cover shall be at least 6 inches. The total applied thickness will be calculated as the clean (unmixed) cover thickness plus 50 percent of the mixing zone thickness where the cover material comprises at least half of the matrix.

3.6 GOVERNMENT INSPECTION

3.6.1 Gauge Maintenance

The Contractor shall maintain its gauges, ranges, location marks and limit marks in proper order and position. The presence of a Government inspector shall not relieve the Contractor of its responsibility for the proper execution of the work in accordance with the specifications and Drawings.

3.6.2 Facilities

The Contractor shall furnish, on the request of the Contracting Officer or any inspector, the use of such boats, boat operators, laborers and material forming a part of the ordinary and usual equipment and crew of the placement plant as may be reasonably necessary in inspecting the work.

3.6.3 Transportation

The Contractor shall furnish, on the request of the Contracting Officer or any inspector, suitable transportation from designated points on shore to and from the various pieces of off-shore plant and off-shore cover areas.

3.6.4 Compliance

Should the Contractor refuse, neglect, or delay compliance with these requirements, the specific facilities may be furnished and maintained by the Contracting Officer, and the cost thereof will be deducted from any amounts due or to become due the Contractor.

3.7 MEASUREMENT

The material placed will be measured in cubic yards in place, by means of soundings taken before and after cover placement. Prior and after surveys will be made by sonic sounding methods. The Government will make prior and after surveys and may make check surveys. The Contractor shall make check surveys. Additional soundings will be taken as the Contracting Officer may deem necessary. Only one (1) prior survey will be made for work required by the Government. If additional prior surveys are required, due to the Contractor's operations, the cost of such surveys shall be paid by the Contractor. The cost of such surveys shall be the same as specified in the Paragraph entitled, "FINAL EXAMINATION AND ACCEPTANCE."

3.7.1 Method of Measurement

Hydrographic Surveys will be conducted to meet USACE Performance Standards as defined in the Hydrographic Surveying Manual EM 1110-2-1003. Surveys will be performed by multi-beam sweep type surveys and/or by single beam sounding equipment. The multi-beam sonar and the single beam sonar will be calibrated following procedures outlined in the aforementioned EM. The same equipment shall be used for priors and after surveys, using the same work platform.

3.7.2 Government Utilization of Multi-beam and Single Beam Sounders for Quantity and Clearance Surveys

The Government may elect to use either Multi-beam or Single beam sounding surveys.

3.7.3 Volume Calculations

In project areas surveyed using multi-beam sonar, the volume of cover material placed will be computed using a TIN (Triangulated Irregular Network) model as outlined in the Hydrographic Surveying Manual EM 1110-2-1003. The HYPACK software TIN model Philadelphia volume calculation method will be used for all multi-beam volume computations. A 1 foot by 1 foot matrix using the average depth sounding will be generated using a plot-scale dependent matrix cell utilizing the minimum depth from the 1 by 1 average dataset used to calculate volumes. The COR may opt to cut cross sections and run volumes using average end area method or standard Hypack volume calculation method to compare cross sections and volumes with the contractor.

In project areas surveyed using single-beam sonar, the volume of cover material placed shall be calculated using the average end area method. The HYPACK software Philadelphia Pre Dredge and Post Dredge volume calculation method shall be used for all single-beam volume computations. All survey data used for volume computations shall be available to the Contractor upon request.

All plots of soundings provided to the Contractor during administration of this contract shall be a graphical representation only and shall not be used volume for calculations.

3.8 FINAL EXAMINATION AND ACCEPTANCE

3.8.1 Examination

As soon as practicable after the completion of the entire work or any section thereof (if the work is divided into sections) as in the opinion of the Contracting Officer will not be subject to damage by further operations under the contract, such work will be thoroughly examined at the cost and expense of the Government by sounding or by sweeping, or both, as determined by the Contracting Officer. The Contractor or its authorized representative will be notified when soundings and/or sweepings are to be made, and will be permitted to accompany the survey party. When the area is found to be in a satisfactory condition, it will be accepted finally. Should more than two (2) sounding or sweeping operations by the Government over an area be necessary by reason of work disclosed at a prior sounding or sweeping, the cost of such third and any subsequent sounding or sweeping operations will be charged against the Contractor at the rate of \$3,500 per calendar day in which the Government plant is engaged in sounding or sweeping and/or is enroute to or from the site or held at or near the said site for such operations.

3.8.2 Acceptance

Final acceptance of the whole or part of the work and the deductions or corrections of deductions made thereon will not be reopened after having once been made, except on evidence of collusion, fraud, or obvious error, and the

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acceptance of a completed section shall not change the time of payment of the retained percentages of the whole or any part of the work.

- End of Section --