AECOM

Remedial Investigation Report

General Mills Slip

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Distribution List

AECOM Technical Services Inc. (AECOM) produced this Remediation Investigation (RI) Report and will maintain its subsequent updates, and its distribution. Dated updates will be provided to those on the distribution list outlined in Section A-3 of the Quality Assurance Project Plan (QAPP). See **Figure 1 of the QAPP** for a complete list of project team members. The header on each page of the RI report will bear the date, month, and year drafted. Revisions to the RI report will be itemized in a summary table.

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Glossary of Acronyms

%	percent
3D	three-dimensional
AECOM	AECOM Technical Services, Inc.
AST	Above Ground Storage Tank
BaP	benzo(a)pyrene
BCCs	bioaccumulative chemicals of concern
bgs	below ground surface
BRRTS	Bureau for Remediation and Redevelopment Tracking System
BSAF	biota-sediment accumulation factor
bss	below sediment surface
BUI	beneficial use impairment
CBR	critical body residues
CFR	Code of Federal Regulations
cm/sec	centimeters per second
COC	Contaminants of Concern
CORS	Continuously Operating Reference Station
CR	Carcinogenic risks
CSM	conceptual site model
CY	cubic yards
DC	Direct Contact
DDD	dichlorodiphenyldichloroethane
DDE	(dichlorodiphenyldichloroethylene),
DDT	dichlorodiphenyltrichloroethane
DDTr	Sum of DDD, DDE, and DDT
DI	daily intake
DRO	diesel range organics
EA	EA Engineering, Science, and Technology, Inc.
EDD	electronic data deliverable
EPC	exposure point concentration
EQuIS	Earthsoft, Inc. EquIS™ Collect Software
ERA	ecological risk assessment
ERP	Environmental Repair Program
ES	Enforcement Standard
ET	Environmental Troubleshooters
EVS	Earth Volumetric Studio
f_{oc}	fraction organic carbon
ft	feet
ft/day	feet per day
ft/year	feed per year
GLRI	Great Lakes Restoration Initiative
GLWQA	Great Lakes Water Quality Agreement
h	hours
HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
kg	kilogram
KP	Kaplan-Meier
LANL	Los Alamos National Laboratory
LOAEL	lowest observed adverse effect level
LUST	Leaking Underground Storage Tank
MEC	midpoint effects concentration
MERC	Midwest Energy Resources Company
mg/kg-day	milligrams per kilogram per day

mL	milliliters
NC	nitrogen and carbon
ND	non-detect
NR	Wisconsin Department of Natural Resources Administrative Code
NTE	Not-to-Exceed
NOAEL	no observed adverse effect level
OPUS	Online Positioning User Server
Pace	Pace Analytical Services, LLC
PAH	polycyclic aromatic hydrocarbon
PAL	Preventive Action Limit
PCB	polychlorinated biphenyl
PEC	Probable Effect Concentration
PID	photo-ionization detector
POTW	publicly owned treatment work
PRG	and preliminary remediation goals
PSD	Particle Size Distribution
PVOC	petroleum volatile organic compound
RAGS	Risk Assessment Guidance for Superfund
RAO	remedial action objectives
RAOR	Remedial Actions Options Report
RCL	Residual Contaminant Levels
RI	Remedial Investigation
RfD	reference dose
RFP	request for proposal
RTK-GPS	realtime-time kinetic global positioning system
SEM/AVS	Simultaneously Extracted Metals/Acid Volatile Sulfides
SF	slope factor
SI	Supplemental Investigation
SIGMA	The SIGMA Group
SIR	Site Investigation Report
Slip	General Mills Slip
SLRAOC	St. Louis River Area of Concern
SOW	scope of work
SQG	sediment quality guideline
s/s	solidification/stabilization
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TCDD	2,3,7,8-tetracholorodibenzo dioxin
TEC	threshold effects concentration
TEF	toxic equivalency factor
TEQ	2,3,7,8-tetracholorodibenzo dioxin equivalents
TMB	tri-methyl benzene
TOC	total organic carbon
TRVs	toxicity reference values
UCL	upper confidence limit
µg	micrograms
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
UV	ultraviolet
VOC	volatile organic compound
WDNR	Wisconsin Department of Natural Resources
WHO	World Health Organization
ww	wet weight

Remedial Investigation Summary
WDNR Superior Slips – General Mills Slip
Superior, Wisconsin

This Remedial Investigation Summary was prepared by personnel with the appropriate qualifications required by NR 712.07(4). AECOM provides the following certification as required by NR 712.09(3)(b):

"I, Kim Elias, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that, to the best of my knowledge, all of the 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."

June 1, 2023

Kim Elias, P.G.
Project Hydrogeologist

Date

1. Introduction

AECOM Technical Services, Inc. (AECOM) has prepared this Remedial Investigation (RI) Report in accordance with the Remedial Investigation Summaries guidelines provided in the Wisconsin Department of Natural Resources' (WDNR) request for proposal (RFP) and Scope of Work (SOW) (WDNR, 2022a). This RI report has been prepared for the WDNR under the United States Environmental Protection Agency (USEPA) Great Lakes Restoration Initiative (GLRI) grant (USEPA GLRI Grant No. GL-00E03068), which includes a 35% nonfederal cost share from WDNR. As detailed in the WDNR RFP and SOW, AECOM has prepared a technical memorandum summarizing the remedial investigation for the General Mills Slip using existing data reviewed under Section 5.3 and supplemental data collected under this SOW. See **Figure 1-1** for the site location. Detailed review of the historical data was summarized in the *General Mills Slip Historical Data Review Technical Memorandum* dated August 8, 2022.

2. Background

2.1 Site Description

The General Mills Slip is a 7-acre inlet off St. Louis Bay located to the west of Interstate 535 and just northwest of the city of Superior, Wisconsin. The General Mills Slip is immediately east of Midwest Energy Resources Company's (MERC) large coal stockpile at the West Waterfront. A berm runs along the eastern side of the dock, on the former site of a railway bed. On the western margin of the slip stands the submerged ruins of the Great Northern Dock, which was reportedly abandoned in the 1960s and now consists of a remnant piling field with a shallow embayment (Engineering, Science, and Technology [EA], 2021).

Figure 2-1 depicts surrounding properties and railways in the immediate vicinity of the Site.

2.2 Historical Use

The General Mills Dock was constructed between 1886 and 1888 according to the *Shoreline Changes Report* (Sigma, 2019a). The Great Northern Railway constructed a grain elevator at the base of the dock in 1886 and Northwestern Fuel Co. used the northern portion of the dock for open-air coal storage between 1888 and 1898 until a grain elevator was constructed on the site of the former coal dock. The northern portion of the dock was converted to an oil transfer and storage depot between the 1930s and 1970s. An oil bunkering facility operated on the west side of the south end of the General Mills Dock between 1932 and 1939. Pipelines ran from a historic petroleum product storage terminal to the dock. The bunkering facility closed between 1961 and 1974. A 21 million-gallon molasses above ground storage Tank (AST) was located on the southern portion of the slip between 1946 and 1955 (The SIGMA Group [SIGMA], 2019a).

MERC is located to the west of the General Mills slip and may be a potential source of contamination in sediments in the St. Louis River Area of Concern (SLRAOC). The MERC site is approximately 181.8 acres and consists of a coal dock extending north into the St. Louis Bay with remnants of the Great Northern Dock to the east. Historical documents indicate the MERC dock was built on the sites of three historical docks (Great Lakes Dock, Carnegie Dock and Leigh Dock). All three docks contained open-air coal storage between 1886 and 1973. In addition to coal storage, the Great Lakes Dock was also used to fuel coal-burning lake ships. Major fires occurred on Leigh Dock on at least two separate occasions. The slips between the three historical docks were filled to form the MERC dock, a coal dock with an open-air storage capacity of seven million tons which began operations in 1976 (SIGMA, 2019b).

Figure 2-2 depicts the locations of the historical docks and the historical site layout of the General Mills Docks and the MERC site.

2.3 Current and Potential Future Use

The General Mills Dock is currently used by General Mills for loading grain into transport ships. Multiple grain elevators are present on the dock. The MERC site is currently a distribution center with coal handling facilities capable of storing up to 7-million tons of coal in an open-air pile, a maintenance garage, railroad tracks, loading docks, ASTs, and a wastewater treatment facility (SIGMA, 2019b). **Figure 2-3** depicts the current layout of the General Mills Docks and MERC facility.

AECOM is currently unaware of any future use plans for the slip and surrounding area. It is assumed that the slip will continue to be used for loading grain and the MERC site will continue to be used for open-pit coal storage. There remains the potential for some fishing and recreational use, although this is expected to be minimal due to the industrialized nature of the slip and surrounding area.

2.4 Local Geological and Hydrogeological Characteristics

2.4.1 Site Hydrogeology/Drainage

According to the 2019 Drainage Patterns Report prepared by SIGMA (2019c), stormwater runoff in the General Mills Slip area is generally in a south to north direction. A Site Investigation Report (SIR) was prepared by Environmental Troubleshooters (ET) on behalf of WDNR (1999). Data collected at the MERC Facility on the western portion of the General Mills Slip indicated that depth to groundwater was approximately 3-5 feet (ft) below ground surface (bgs), hydraulic conductivity was measured at 7×10^{-3} centimeters per second (cm/sec) (20 feet per day [ft/day]), local groundwater flow was to the northeast towards the St. Louis Bay of Lake Superior, and an average linear flow velocity was estimated at 122 feet per year (ft/year) (ET, 1999a).

2.4.2 Site Geology

Upland material was excavated and removed as part of construction of the General Mills Dock. Sediments residing at the sediment-water interface in the southern limits of the slip would be expected to be Holocene sediments that accumulated over the past 140 years, while the deeper strata would be more indicative of upland soils and geology (EA, 2021).

Sub-bottom profiling data collected in the 2021 SIR displayed evidence of multiple distinct sediment strata within the upper sediment column. In general, fine-grained, lower density sediments (silts) ranging in thickness from 1 to 4 ft were found over intervals of mixed or chaotic layers of material. These mixed strata were 2 to 6-ft thick and commonly comprised of intervals of sand or sand mixed with silts and clays. The parent sediment was determined to be a homogenous, fine sand that resided below the localized disturbances caused by construction activity or repeated dredging.

2.5 Historical Investigations and Remedial Actions

Historical investigations and remedial actions related to the General Mills Slip have been conducted from 1999 through 2022. Historical site assessments, investigations, and remedial actions that have been conducted to date at the General Mills Slip are summarized below and were discussed in greater detail in the *General Mills Historical Data Review Technical Memorandum* submitted to WDNR by AECOM in 2022.

2.5.1 October 1999 Site Investigation Report Midwest Energy Backup Generator Site

ET submitted a report titled *Site Investigation Report Midwest Energy Backup Generator Site* (ET, 1999a). The primary objective of this field investigation was to determine the source, nature, degree, and extent of contamination in soil and groundwater at the MERC Site following a petroleum release from a 5,000-gallon diesel underground storage tank (UST). Approximately 140 cubic yards (CY) of petroleum contaminated soils were excavated during the UST removal. One pre-remedial soil sample was collected from the UST basin and two pre-remedial soil samples were collected from the excavated soils in 1998.

Post-remedial soil samples were collected at five locations from depths between 4 and 16 ft bgs. Additionally, three *in situ* groundwater samples were collected. An additional three soil locations were sampled at depths from 4 to 12-ft bgs and five soil borings were advanced and converted to monitoring wells and sampled in May and September 1999. Soil and groundwater samples were analyzed for the following parameters: diesel range organics (DRO), petroleum volatile organic compounds (PVOCs), and polynuclear aromatic hydrocarbons (PAHs). Sample locations are presented in **Figure 2-4**.

The results of this investigation concluded that soil contamination appeared to be confined to the immediate area near the former UST basin. Soil contamination extended vertically from 4 to 8-ft bgs. DRO and PVOCs were detected in the groundwater monitoring wells below the Wisconsin Department of Natural Resources Administrative Code (NR) 140 Enforcement Standard (ES) and Preventive Action Limit (PAL). A remedial action occurred to remove soil with elevated DRO concentrations related to the UST petroleum release. Remaining soil impacts following remedial excavation were addressed with a 10-mil polyethylene plastic liner which was covered with clean fill. A letter dated April 4, 2000, from the WDNR considered the case “closed” having determined no further action was necessary at that time.

2.5.2 1999 Site Characterization Report Midwest Energy UST Fueling Site, Superior, Wisconsin

ET submitted the report titled *Site Investigation Report Midwest Energy UST Fueling Site* (ET, 1999b). The site investigation was conducted for the MERC UST Fueling site, where USTs were used for storage of diesel fuel and waste oil at the MERC Site. The primary objective of this field investigation was to identify the source, nature, degree and extent of contamination in the soil and groundwater after a 12,000-gallon petroleum UST release was discovered. Approximately 100 CY of petroleum contaminated soils were excavated during the UST removal. One pre-remedial soil sample was collected from the UST basin, and two pre-remedial soil samples were collected from the excavated soils to assess for potential diesel contamination in 1998. Post-remedial sampling included eight soil borings collected for analysis with depths ranging from 2 to 24-ft bgs. Six monitoring wells were installed in June 1999, and soil samples were collected from Geoprobe borings. Monitoring wells MW-1 to MW-6 were sampled between June 23, 1999, and October 1,1999. Soils were analyzed for DRO, PVOCs, PAHs, polychlorinated biphenyls (PCBs), lead, and cadmium. Groundwater was analyzed for DRO, volatile organic compounds (VOCs)/PVOCs, lead, and PAHs. Sample locations are presented in **Figure 2-4**.

The results of this investigation concluded that soil contaminant levels are above the NR 720 generic soil standards for DRO. Soil petroleum contamination appears to be confined to the area around the diesel waste oil UST system and immediate area to the east and southwest. The first round of sampling indicated a presence of moderate level DRO contamination. Toluene, total xylenes, tri-methyl benzene (TMB) , and lead were detected in the first round of sampling. Lead concentrations were above the PAL. The second round of sampling demonstrated levels below the laboratory detection limits and PALs in all six monitoring wells. Decreased presence of site contaminates from the first to second round of sampling indicate natural attenuation is occurring in groundwater at the site. A small quantity of free product was encountered during tank removal. A sump was installed in the former waste oil UST basin to collect any free product. No measurable free product was observed in the sump, and on April 6, 2000, the State of Wisconsin Department of Natural Resources considered the case “closed” having determined no further action was necessary at that time.

2.5.3 2016 Site Characterization Report Assessment of Contaminated Sediments Superior Waterfront Characterization, St. Louis River and Bay Area of Concern

EA submitted the report titled *Site Characterization Report, Assessment of Contaminated Sediments, Superior Waterfront Characterization, St. Louis River and Bay Area of Concern* (EA, 2016). The primary objective of this field investigation was to obtain the data necessary to assess the sediment quality in the Superior Waterfront area and to “evaluate the priority of each area for further assessment or remediation.” Sampling took place in July 2015, at four sediment sampling locations within the General Mills Slip.

Sediment sample depths ranged from 0 to 6-ft below the sediment-water interface. Samples were analyzed for one or more of the following parameters: PAHs, PCBs, Target Analyte List (TAL) metals, mercury, Simultaneously Extracted Metals/Acid Volatile Sulfides (SEM/AVS), pesticides, organotins, grain size analysis, total organic carbon (TOC), and percent moisture. Additionally, one location was analyzed for acute and chronic toxicity analysis, using the 10-day *Chironomus riparius* and the 28-day *Hyalella azteca* bioassays. **Figure 2-5** depicts the sediment sampling locations.

The results of this investigation concluded that the highest sediment quality guidelines (SQG) exceedances were generally in the subsurface samples. Probable effect concentration (PEC) exceedances in surface sediments were detected closer to the shoreline. Concentrations of 17 PAHs measured two times the PEC at one sediment sample and tributyltin was detected at another sediment sample at concentrations two and five times greater than the PEC. The surface sediment samples tested for toxicity indicate adverse effects to both test species and had measured concentrations that exceeded the PEC.

2.5.4 2021 Site Investigation Report Characterization of Sediments in the North End District Clough Island St Louis River and Bay Area of Concern, Superior, Wisconsin

EA submitted the report titled *Site Investigation Report, Characterization of Sediments in the North End District and Clough Island, St. Louis River and Bay Area of Concern, Superior Wisconsin* (EA, 2021). The primary objective of this field investigation was to obtain the data necessary to evaluate the degree and extent of sediment contamination, identify potential sources of contamination, and identify if further investigation or remedial action is required. A geophysical survey of the dock area was conducted in April and May 2020, and sediment sampling took place between June and July 2020 at 14 sediment sampling locations. Sediment sample depths ranged from 0 to 10-ft below the sediment surface. Samples were analyzed for one or more of the following parameters: VOCs, semi-volatile organic compounds (SVOCs), PAHs, PCBs, TAL metals, mercury, dioxins/furans, organotins, coal particles, grain size analysis, TOC, and percent moisture. Three samples were selected for toxicity testing to evaluate acute toxicity bioassays, chronic toxicity bioassays, and bioaccumulation exposures using the 10-day *C. riparius* bioassay, the 28-day plus 4-hour ultraviolet (UV) light *H. azteca* bioassay, and the 28-day *Lumbriculus variegates* bioassay. Eight surface samples and ten subsurface samples, collected from six locations at depths ranging from 0.3 to 4 feet, were collected for microscopic coal analysis. **Figure 2-5** depicts the sediment sampling locations.

Investigation results indicated that most sediment sample locations exhibited PEC exceedances for organic compounds, including PAH18, dioxins, and tributyltin. Concentrations in the surface samples were generally lower than concentrations in samples collected at depth. Some locations exhibited exceedances of the PECs for lead and manganese. All three site locations selected for toxicity testing had an adverse effect on *H. azteca* survival. Microscopic coal analysis results indicated that the surface samples ranged from 2 percent (%) to 12% coal. Coal was detected in all other samples ranging from 1% to 8%. Four locations that had samples taken at both 0.3 to 2 ft and 2 to 4 ft had similar coal percentages between the two layers. Two coal samples taken from 0.3 to 2 ft, had 2% coal.

3. 2022 Field Investigation

3.1 Work Completed

The supplemental investigation (SI) included a limited geotechnical investigation at the General Mills Slip for inclusion in site stability evaluations. Sediment samples were collected for a treatability study to refine efficacy assumptions for potential ex situ sediment management alternatives. This supplemental data collection was necessary to help achieve WDNR's primary objective of evaluating and recommending remedial actions for the General Mills Slip. Work performed during the SI will be used to update the site-specific Conceptual Site Model (CSM) and identify impacted material based on risk-based cleanup standards and applicable remedial objectives (AECOM, 2022a).

To obtain accurate geographic position during sampling, Affiliated Researchers utilized real-time kinetic global positioning system (RTK-GPS) survey equipment to confirm known survey controls near the project site and established new survey control near the project site using National Geodetic Survey (NGS) Online Positioning User Server (OPUS) methods. Affiliated Researchers used RTK corrections broadcast from the Wisconsin Continuously Operating Reference Station (CORS) Virtual Reference Station (VRS) network. Horizontal survey data was collected in NAD83 US State Plane Coordinate System and vertical data in NAVD88.

Earthsoft, Inc. Environmental Quality Information System (EQuIS™) Collect Software was utilized during sediment collection to log data such as core penetration, core recovery, and water quality parameters. During core processing, all data logging was performed within the EQuIS Collect Software™ to describe differentiating layers and sediment types logged using Unified Soil Classification System (USCS) soil descriptions, including sample recovery, sample depths, photo-ionization detector (PID) readings, and observation of visual impacts and/or odors (AECOM, 2022a).

3.1.1 Geotechnical

The limited geotechnical investigation was performed to collect information on the nature and physical characteristics of the General Mills Slip sediments. On July 28, 2022, Affiliated Researched collected two sediment samples for geotechnical analysis using a 25-ft Vibracore sampling vessel. RTK-GPS survey equipment was used to navigate to the sample locations and to record the position of the sample locations. Each of the cores were observed for differentiating layers and sediment types; the data was logged in EQuIS™ Collect Software.

AECOM collected three geotechnical samples (2022-GT-GM-01(4-5.3'), 2022-GT-GM-02(2-3.5'), and 2022-GT-GM-02(5-6')) for analysis. Samples were analyzed by Pace Analytical Services, LLC (Pace) for moisture content, TOC, Atterberg limits, bulk density and particle size distribution (PSD). Laboratory analytical methods for each analyte are listed below:

- Moisture Content (ASTM, International [ASTM] 2974),
- TOC (elemental nitrogen and carbon [NC] soil analyzer),
- Atterberg Limits (ASTM D4318),
- Bulk Density (ASTM D7263), and
- PSD (USCS) (ASTM D422 and ASTM D2487).

The targeted sample depth was 10-ft below the sediment surface. Refusal at locations 2022-GT-GM-01 and 2022-GT-GM-02 occurred at 10 ft and 6.2 ft, respectively. One sample was collected at 2022-GT-GM-01 from 4 to 5.3-ft bgs; two samples were collected at 2022-GT-GM-02 from 2 to 3.5-ft bgs and 5 to 6-ft bgs. Sample collection depths were determined based on lithology observed in the field.

Figure 3-1 depicts sample locations and **Table 3-1** present PSD results. Boring logs and photos are provided in **Appendix A** and **B**, respectively. Results of the geotechnical investigation are discussed in the *Data Gap Treatability Report* (AECOM, 2022c).

3.1.2 Bench-scale Sediment Management Treatability Study

Bulk samples (2022-TS-GM-01, 2022-TS-GM-02) were collected from two locations, one from each side of the slip that were assumed to be representative of the range of conditions for remediation (**Figure 3-1**). Surficial sediment samples were collected (the top 0 to 12 inches) using a petite ponar clamshell dredge sampler. Two surface water grab samples were collected from approximately one foot below the water surface to support treatability testing. Water quality parameters were collected at both sample locations at approximately 1-foot below the water surface, using a YSI multiparameter instrument to record temperature, dissolved oxygen, pH, and conductivity. Water quality parameters and sample locations are listed in **Table 3-2**.

3.1.2.1 Treatability Testing

AECOM performed preliminary treatability testing at their Treatability Laboratory (Austin, TX) to assess the efficacy of various dewatering technologies to develop the specified criteria for sediment management and effluent discharge, and to determine full-scale treatment system design parameters. AECOM homogenized each aliquot separately, conducted confirmation analysis on the material for moisture content (ASTM D2216), PSD (laser diffraction), and specific gravity (ASTM XD854) and mixed the surface water and sediment to form a test slurry that was sampled and analyzed for moisture content. AECOM prepared a slurry mixture to five percent solids by weight and aliquots collected and analyzed to confirm solids content (AECOM, 2022a).

Slurry samples (5% dry weight solids) from the site sediment were tested to determine the type and dosage of chemical conditioning program required. Polymer selection was based on the effectiveness of each chemical condition program to generate dry cake solids after 24-hours, greatest release of filtrate volume after 5-minutes, and filtrate with low total suspended solids concentration.

Conditioned slurry samples (200-milliliters [mL]) were poured through geotextile fabric to confirm selection and dose of the polymer(s) selected during jar testing. Conditioned sediment slurry samples are poured through geotextile tube filter material to capture solids on the fabric sample. Dewatered sediment retained on the geotextile tube fabric was used to evaluate filter cake percent solids as a function of polymer type, dosage and dewatering time.

Bench-scale geotextile tube pillow testing was conducted by conditioning a 40-liter slurry sample and pouring it through a 40-liter geotextile tube pillow in two fill events (0-hours [h] and 48-h). Dewatered sediment retained within the pillow test was collected over a 7-day period to evaluate solids content as function of dewatering time. Filtrate volume and quality was evaluated after each fill event.

3.1.2.2 Solidification/Stabilization Treatability Test

A solidification/stabilization (s/s) treatability test was performed to identify a potential range of reagents and mix ratios that may be used to successfully dewater and/or stabilize the residual material for transport and disposal. Tests used to support the feasibility study included:

- Gravity/Stacking of bulk sediment (includes a paint filter test),
- Index Testing,
- Sample Screening, and
- Optimized Mix Development.

3.1.2.3 Water Treatability Test

Filtrate water that is generated during dewatering could potentially require on-site treatment, depending on the method of dewatering and the use of polymers and coagulants. Several water treatment operations may be needed to remove the range of constituents that may potentially be present in the filtrate water prior to discharging to surface water or municipal wastewater treatment systems (AECOM, 2022a). A filtrate water treatability test was performed to assess the effectiveness of various technologies to meet direct discharge to surface water or publicly owned treatment works (POTW) -specified criteria for discharge. Untreated and treated water samples was subsequently analyzed by Pace. Target contaminants of concern (COCs) will be identified and analyzed upon review of historical data within the General Mills Slip and coordination with the local POTW.

Results from the bench-scale treatability test are discussed in the *Data Gap Treatability Report* (AECOM, 2022c).

3.1.3 Structural Geotechnical/Dock Wall Survey

The main objective of the preliminary engineering assessment was to observed existing site shoreline conditions and identify data gaps related to a geotechnical and structural analysis of the existing slip shoreline. For the preliminary engineering assessment, the following scope of services were completed:

- Contact property owners to locate available historical design and construction records for existing wall segments.
- Document review and scanning to archive electronic versions of available construction and design documents obtained from property owners.
- Perform an engineering site visit to view and document the current condition of walls supporting the slips. Observations made from the site visits were used to compare existing site conditions to available record drawings.

Visual observations of the General Mills dock wall from land and water were performed by an AECOM civil engineer on September 28, 2022. The results of the preliminary engineering assessment are provided in **Appendix C**. The report summarizes the historical documents received and reviewed pertaining to the existing slip shoreline; field observations made during September 2022 site visit; and identifies data gaps that will require further assessment and field investigation during the preliminary design phase of the overall Superior Slips remedial action option report (RAOR) project.

3.2 Data Management

AECOM has implemented a data information management system for the spatial evaluation and historical environmental data utilizing the EQuIS™. The EQuIS™ database was uploaded with electronic data deliverables (EDDs) pertaining to the Slip's historical laboratory data and verified submission into the database using the EQuIS™ Data Processor software. The main purpose of this database is to translate the EDD format into a format suitable for loading into the Reporting Database. The laboratory results were then screened against applicable site residual contaminant levels (RCLs) and SQGs and summary tables are generated for reporting. Data modeling was completed utilizing ArcGIS, AutoCAD, gINT™, and EVS™ software for spatial analysis, environmental data visualization, mapping, figure generation for reporting, and any other visual representation required for the project.

Additionally, AECOM created project-specific queries within the EQuIS™ project database to calculate the total (18) polycyclic aromatic hydrocarbons (tPAH) and PCB values and present them in the report data tables. In general, tPAH and PCB values were calculated using the following presentations:

- Using non-detects results (ND) equal to 0.
- Using 0.5x the method detection limit.
- Using 0.5x the reporting limit for the historical data.

4. Distribution of Contamination and Background Levels

4.1 Site Chemicals of Concern

Analytical results of sediment samples collected during 2015 and 2020 sampling events were compared to the WDNR's SQGs, including the threshold effects concentrations (TECs), midpoint effects concentrations (MECs), and probable effects concentrations (PECs) to assess potential ecological effects. Analytical results compared to the SQGs are presented in **Tables 4-1.1** and **4-1.2**. Additionally, sample results have been compared to Chapter NR 720 of the Wis. Admin. Code soil cleanup standards default RCLs for non-industrial and industrial direct contact (DC) not-to-exceed (NTE) to assess direct contact risk for human health, namely industrial and recreational use and soil-to-groundwater RCLs to evaluate restrictions for disposal of dredged material in an upland setting, which includes direct contact and soil to groundwater levels. Analytical results compared to the RCLs are presented in **Tables 4-2.1** and **4-2.2**. Furthermore, samples were compared to sediment background threshold values for SLRAOC (site-specific) and statewide soils in WDNR 2022b and USGS 2011, respectively[1]. Screening against the SQGs, RCLs, and background collectively helps to identify contamination levels that may trigger additional requirements and costs for dredging and the applicability of the BUI for restrictions on dredging activities.

VOCs, SVOCs, PAHs, metals, PCBs, and dioxins/furans were detected in the samples collected from 18 locations throughout the Slip or were non-detect with a reporting limit exceeding the screening criteria. Below is a summary of site COCs. Sample screening included analytes with laboratory non-detect values where the reporting limits exceed the screening criteria, unless noted otherwise.

4.1.1 Volatile Organic Compounds

Sediment samples collected in 2015 were not analyzed for VOCs. Three 2020 surface sample (0 to 0.3 ft below sediment surface [bss]) locations (ND20-GM02, ND20-GM04, and ND20-GM08) were analyzed for VOCs.

Each of the three surface sample locations analyzed for VOC concentrations exhibited laboratory non-detect values exceeding the SQGs; VOCs exceeding the SQGs (TEC and MEC values) included 1,2,4-trichlorobenzene and xylene. Analytical results compared to the SQGs are presented in **Tables 4-1.1** and **4-1.2**.

VOC concentrations of 17 analytes exhibited laboratory non-detect values exceeding the soil-to-groundwater RCLs in all three surface sample locations.

VOC concentrations of 1,2-dibromo-3-chloropropane exhibited laboratory non-detect values exceeding non-industrial DC NTE RCLs in all three surface sample locations. There were no exceedances of the industrial DC NTE RCLs for VOCs.

Analytical results compared to these pathways are presented in **Tables 4-2.1** and **4-2.2**. No figures were created to illustrate these non-detect samples.

4.1.2 Semi-volatile Organic Compounds

Sediment samples collected in 2015 were not analyzed for SVOCs. All 14 sediment samples collected in 2020 were analyzed for SVOCs.

Dibenzofuran exceeded the SQGs in 12 sample locations, except for ND20-GM05 and ND20-GM13. Five SVOC analyte concentrations exhibited laboratory non-detect values exceeding the SQGs including 2,4-dimethyl phenol, diethyl phthalate, dimethyl phthalate, di-n-octyl phthalate, and pentachlorophenol. Dibenzofuran exceeded the 2xPEC at sample location ND20-GM07 at 4-6 ft below the sediment-water interface. **Figure 4-1** presents the locations and distribution of the samples exceeding the SQGs for SVOCs. The figure excludes the sample results in which SVOC concentrations were not detected and the laboratory reporting limits exceeded the screening criteria for SQGs.

SVOC concentrations of seven analytes exhibited laboratory non-detect values exceeding the soil-to-groundwater RCLs detected in all fourteen 2020 sample locations at varying depths throughout the Slip.

SVOC concentrations of five analytes exhibited laboratory non-detect values exceeding the non-industrial DC NTE RCLs. Concentrations of pentachlorophenol exhibited laboratory non-detect values exceeding

[1] Background threshold values (BTVs) for SLRAOC sediment are represented by the 95/95 UTL for each compound after outlier removal and are intended to represent the upper range of background concentrations for each compound. BTVs for Wisconsin surface soils are the maximum metal levels after outlier removal.

the industrial DC NTE RCLs in 6 sample locations. No figures were created to illustrate these non-detect samples. Analytical results compared to these pathways are presented in **Tables 4-2.1** and **4-2.2**.

There were no samples which contained SVOCs, excluding the 18 PAHs discussed in the following section, at concentrations exceeding the site-specific SLRAOC calculated sediment background values.

4.1.3 Polycyclic Aromatic Hydrocarbons

All 18 sample locations collected in 2015 and 2020 were analyzed for 18 PAHs by USEPA Method SW8270D (SVOCs) and used for tPAH[2] calculations. Concentrations exceeding individual PAHs and tPAH criteria included laboratory non-detect values.

Individual PAH concentrations of the 18 analytes exceeding the SQGs were detected at all 18 sample locations. Concentrations of 13 analytes were detected at levels exceeding 5xPEC at 10 sampling locations from various depths. **Figure 4-2** presents the locations and distribution of the samples exceeding the SQGs for PAHs.

tPAHs exceeded the SQGs at all locations at varying depths, with the exception of ND20-GM13. Ten sample locations exceeded PEC throughout the Slip. Additionally, tPAHs exceeded 5xPEC at one sample location, in one sample interval [ND20-GM07 (4-6)]. **Figure 4-3** presents the locations and distribution of the samples exceeding the SQGs for tPAHs.

PAH concentrations exceeding the soil-to-groundwater RCLs were detected in all sample locations throughout the Slip, with the exception of ND20-GM13. PAHs exceeding the RCLs included benzo(a)pyrene (BaP), benzo(b)fluoranthene, chrysene, and naphthalene. BaP exceeded the 2022 site-specific SLRAOC sediment background values at ten sample locations, at various depths, as shown in **Tables 4-1.1** and **4-1.2.**

PAH concentrations of five analytes exceeded the non-industrial DC NTE RCLs in all sample locations, with the exception of ND20-GM13. BaP exceeded the industrial DC NTE RCLs at six sample locations. Analytical results compared to these pathways are presented in **Tables 4-2.1** and **4-2.2**. BaP exceedances of industrial DC NTE RCLs are ubiquitous in the Slip and will subsequently limit opportunities for ex situ sediment management and therefore disposal may be limited to a commercial landfill or other regulated confined disposal facility (CDF). Opportunities for land application, beneficial reuse and management in an unlined, upland site will be limited due to these exceedances. As a potential concern for dredging, the locations where sediment sample locations exceed the industrial DC NTE RCLs are presented on **Figure 4-4.**

4.1.4 Metals

Metal concentrations exceeded the SQGs at all 18 sample locations, for ten analytes. Of the ten analytes exceeding the SQGs, all silver exceedances were laboratory non-detect values. Four sample locations exceeded PEC for either lead or manganese. Concentrations of lead exceeded 2xPEC in one sample [ND20-GM02 (6-8)]. **Figure 4-5** presents the locations and distribution of the samples exceeding the SQGs for metals.

Metals concentrations exceeded the soil-to-groundwater RCLs at all 18 sample locations, for 14 analytes. All silver and thallium exceedances were laboratory non-detect values. Copper, lead, manganese, and zinc exceeded the 2022 site-specific SLRAOC sediment background values at eight sample locations, at various depths. **Tables 4-2.1** and **4-2.2** present the locations of the samples exceeding these RCLs.

Arsenic concentrations at all sample locations and depths exceeded the industrial and non-industrial DC NTE RCLs. Thallium exceeded the industrial and nonindustrial DC NTE RCLs; however, all exceedances were laboratory non-detect values. Metals exceedances of industrial DC NTE RCLs will limit opportunities for ex situ sediment management other than disposal at a commercial landfill or other regulated CDF.

[2] Total 18 PAHs calculated using compounds: 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(e)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-Cd)pyrene, naphthalene, phenanthrene, and pyrene

Opportunities for land application, beneficial reuse and management in an unlined, upland site may be limited due to these exceedances. As a potential concern for dredging, the locations where sediment sample locations exceed the Wisconsin soil BTV, and the industrial DC NTE RCLs are presented on **Figure 4-4.**

4.1.5 Polychlorinated Biphenyls

Nine sample locations were analyzed for PCBs. Individual PCB/aroclor did not exceed the SQG criteria at any sample locations. Total PCB concentrations were calculated at each sample location, with the assumption that a ND result is equal to zero. Total PCB concentrations exceeded MEC in three samples (SW15-SLB05 from 0.5-2 ft and 2-4 ft bss, ND20-GM05, from 2-4 ft bss). **Figure 4-6** presents the locations of the samples exceeding these analytes.

No individual PCBs results exceeded the soil-to-groundwater RCL. Concentrations of total PCB concentrations exceeded the soil-to-groundwater RCL in 15 of the 24 samples analyzed. Concentrations of Aroclor 1248 and total PCBs in sample ND20-GMB05 (2-4) exceeded the non-industrial DC NTE RCL. There were no industrial DC NTE RCL exceedances for PCBs. Analytical results compared to these pathways are presented in **Tables 4-2.1** and **4-2.2**.

The concentration of total PCBs detected in sample SW15-SLB05 (2-4) exceeded the 2022 site-specific SLRAOC sediment background value. **Tables 4-1.1** and **4-1.2** present the locations of the samples exceeding the RCLs.

Table 4-1.1 and Table 4-1.2 present the location of the sample exceeding the RCLs.

4.1.6 Dioxins/Furans and Organotins

Limited sample locations and depths were analyzed for dioxins/furans and organotins.

Dioxins/Furans concentrations of five analytes exceeded the non-industrial DC NTE RCLs and two analytes exceeded the industrial DC NTE RCLs in sample ND20-GM02 (0-0.3’). Two analytes exceeded the non-industrial DC NTE RCLs in sample ND20-GM04 (0-0.3’). **Tables 4-2.1 and 4-2.2** present the locations of the samples exceeding these RCLs. As a potential concern for dredging, the locations where sediment sample locations exceed the industrial DC NTE RCLs are presented on **Figure 4-4.**

Concentrations of organotin tributyltin hydride exceeded the SQGs in 11 sample locations. Sample location SW15-SLB05 (0-0.5) exceeded the 2xPEC criteria, and sample locations SW15-SLB (0.5-2), ND20-GM09 (2-6), and ND20-GM11 (0-0.3) exceeded criteria for 5xPEC. **Figure 4-7** presents the locations of the samples exceeding the SQGs. Analytical results compared to the SQGs are presented in **Table 4-1.1** and **4-1.2**.

4.2 Data Gaps

After review of the historical site data collected to date, analytical data gaps in sediment have been identified and are described below.

4.2.1 Volatile Organic Compounds

VOCs have not been horizontally or vertically delineated within the Slip, as a limited number of samples were analyzed for VOCs. Surface sediment samples from sample locations ND20-GM02, ND20-GM04, and ND20-GM08 were the only samples in the Slip analyzed for VOCs. VOCs were not detected above TECs in the three samples; however, the reporting limits for 1,2,4-trichlorobenzene and total xylenes were above the TECs. 2-Butanone and acetone were detected but neither compound has a TEC value.

4.2.2 Polynuclear Aromatic Hydrocarbons

PAHs detected above their respective TEC values included 18 PAHs and dibenzofuran. TEC exceedances were measured at all eighteen sample locations. PAHs are not horizontally delineated to the west and to the north of the General Mills Slip characterization area. PAHs are not vertically delineated to concentrations below the TEC at the following core locations:

Location ID	Depth (feet bss)	Location ID	Depth (feet bss)	Location ID	Depth (feet bss)
ND20-GM01	4	ND20-GM02	10	ND20-GM03	10
ND20-GM06	6	ND20-GM10	6	ND20-GM11	6
ND20-GM12	6	ND20-GM013	0.3	SW15-SLB04	2
SW15-SLB05	6	SW15-SLB06	6	SW15-SLB07	0.5

An isoconcentration map for tPAHs is presented in **Figure 4-8**. **Figure 4-9** depicts the locations of the cross-section traces. Cross sections depicting the distribution of tPAHs within the Slip geology are depicted on **Figures 4-10.1** to **4-10.3**.

4.2.3 Metals

Metals detected above their respective TEC values included antimony, cadmium, copper, lead, iron, manganese, mercury, nickel, and zinc. TEC exceedances were observed at all eighteen sample locations, except for ND20-GM13, which was sampled only to 0.3 ft. Metals are not horizontally delineated to the north or west. Metals are not vertically delineated to concentrations below the TEC at the following core locations:

Location ID	Depth (feet bss)	Location ID	Depth (feet bss)	Location ID	Depth (feet bss)
ND20-GM01	4	ND20-GM03	10	ND20-GM006	10
ND20-GM010	6	ND20-GM012	6	ND20-GM014	6
SW15-SLB04	2	SW15-SLB06	6	SW15-SLB06	0.5

4.2.4 Polychlorinated Biphenyls

A limited number of samples were analyzed for PCBs. Locations ND20-GM03, ND20-GM06 through ND20-GM11, ND20-GM13, and ND20-GM14 were not analyzed for PCB concentrations. Total PCBs exceeded the WDNR SQGs at ND20-GM04 and SW15-SLB05 at 2 to 4-feet below the surface water interface. Due to shallow sample depths at above 2 feet at most sample locations, PCBs have not been vertically or horizontally delineated.

4.2.5 Dioxins/Furans and Organotins

Dioxins have not been vertically or horizontally delineated due to a limited number of samples that were only analyzed for dioxins at the surface. Locations ND20-GM02, ND20-GM04 and ND20-GM08 exhibit detections above TEC in the upper 0.3 feet.

Organotin tributyltin hydride was detected above the TEC at sample locations SW15-SLB05, ND20-GM07, ND20-GM09, ND20-GM11, and ND20-GM13. All other samples did not have detections of tributyltin; however, reporting limits were above the TEC SQG. Sample locations SW15-SLB04, SW15-SLB06, SW15-SLB07, ND20-GM03, ND20-GM06, and ND20-GM07 were not analyzed for organotins. Organotin detections are laterally delineated to the north and southeastern portions of the Slip but not to the east or west, due to limited sample locations analyzed. Tributyltin detections are not vertically delineated to concentrations below the TEC at the following core locations:

Location ID	Depth (feet bss)	Location ID	Depth (feet bss)
ND20-GM09	10	ND20-GM11	6
SW15-SLB05	2	ND20-GM13	0.3

An isoconcentration map for tributyltin hydride is presented on **Figure 4-12**.

4.2.6 Pesticides

Pesticides have not been vertically or horizontally delineated due to a limited number of samples collected within the Slip. Pesticides were analyzed at depths of 0 to 2 feet at locations SW15-SLB05 and SW15-SLB06 and 0 to 0.5 feet at SW15-SLB07. All concentrations were non-detect, however, laboratory reporting values exceed the SQG criteria.

5. Conceptual Site Model

A CSM generally includes information on known contaminant sources and impacted media, other potential sources, transport pathways, exposure pathways, and receptors. A preliminary CSM for the General Mills Slip was previously presented in the *Historical Data Review Technical Memorandum* (AECOM, 2022b). The preliminary CSM was largely obtained from the Site Investigation Report, *Characterization of Sediments in the North End District and Clough Island, St. Louis River and Bay Area of Concern, Superior Wisconsin* (EA, 2021). The following description of the CSM has been updated, as necessary, as additional information has been reviewed. Depictions of the CSM for General Mills Slip are presented on **Figures 5-1** and **5-2.**

5.1 Potential Sources of Contamination

Given the history of filling activities, large-scale open-air coal storage, petroleum bunkering and storage, and confirmed soil and groundwater contamination at the General Mills Dock and MERC Dock, contamination may have impacted sediments in the St. Louis River via surface runoff, subsurface contaminant migration, wind dispersal or filling activities. Based on the data collected in 2015 and 2020, the main contaminants of concern in General Mills Slip sediments are PAHs, metals, dioxins and pesticides.

5.1.1 The General Mills Dock

According to the *Historic Records Screening Report* (SIGMA, 2019b), the General Mills Dock contains a closed UST with continuing obligations and an open and closed Environmental Repair Program (ERP) which may have led to potential impacts to the sediments in the St. Louis River. The Leaking Underground Storage Tank (LUST) site (Bureau for Remediation and Redevelopment Tracking System [BRRTS] #03-16-559534) has been closed.

Contaminated soils were discovered on site after a 1,000-gallon oil UST was removed. Some of the soil was over excavated, however due to the presence of a sewer septic system, some soils containing petroleum related compounds exceeding the applicable NR 720 RCLs were left in place.

The General Mills site is an open ERP site (BRRTS #02-16-272248) with petroleum impacts in the southwest section of the property. The property is also a closed ERP site (BRRTS #02-16-558264) with continuing obligations. The closed site is impacted with arsenic in a layer of soil that was historically placed at the property.

Other historical activities with potential environmental impacts at the General Mills Dock that could potentially contribute to contamination in the St. Louis River include open-air coal storage, oil bunkering facilities, and potential undocumented petroleum pipeline leaks from pipelines that originated from the historical petroleum product storage terminal located to the west of the site.

5.1.2 The Midwest Energy Resources (MERC) Dock and Potential Upland Sources

According to the *Historic Records Screening Report* (SIGMA, 2019b), the Midwest Energy Resources (MERC) Dock has two closed LUSTs (BRRTS #03-16-205568 and BRRTS #03-16-205569) and a closed ERP site (BRRTS #02-16-201976). The dock is also a registered AST site, with one 500-gallon fuel oil AST, two 1,000-gallon gasoline ASTs, one 6,000-gallon waste oil AST, and one 1.5-million-gallon diesel AST historically, but no longer located at the site.

The two closed UST sites were opened in 1998 following the removal of a 5,000-gallon diesel UST and a 12,000-gallon diesel UST, both located on the northern end of the site. Both cases were closed in 2000 without continuing obligations.

Contamination from a former AST system in the southwestern section of the site was remediated to satisfaction of regulatory standards and the case was closed in 2003 without continuing obligations.

Historical activities at the three historical docks combined into the present-day MERC dock could have potentially contributed to contamination in the St. Louis River. The *Historic Records Screening Report* (SIGMA, 2019b) noted that all three docks comprising the MERC Dock stored large amounts of coal in open-air storage piles. Coal could have been transported via air into the St. Louis River. The Great Lakes Dock was used to fuel coal-burning lake ships, which could have the potential to lead to undocumented spills. At least two major fires were documented at Lehigh dock, which could have spread contamination. In the late 1950s, Murphy Oil and Shell Oil constructed pipelines on the western side of Carnegie Dock, which was used to transfer gasoline onto tanker ships. Pipeline leaks or spills may have contributed to contamination.

5.2 Impacted Media and Transport Pathways

Sediments are the primary media of concern for this study. As previously discussed, multiple lines of evidence suggest that products historically transferred at the dock are potential sources of contaminants contributing to sediment impacts including products transferred at the General Mills Dock over the long operational history (over 130 years). Based on the history of coal and petroleum transport and storage, a documented release of petroleum, and documented soil and groundwater contamination in adjacent sites and the site's proximity to the bay, contamination associated with the General Mills Slip may have impacted sediments in the SLRAOC AOC via surface run-off, wind dispersal, subsurface contaminant migration, or filling activities (SIGMA, 2019b).

Other potential contaminant transport pathways to sediments include:

- From a tanker to surface water;
- A spill off the dock;
- Undocumented petroleum pipeline leaks that ran from the historical petroleum product storage terminal to the west of the General Mills Slip;
- A leak in an underground storage tank and a subsurface pathway to the sediment; and
- Groundwater to surface water contaminant transport.

5.3 Current and Potential Future Receptors and Applicable Exposure Pathways

The area surrounding the General Mills Slip is heavy industrial. Because the area is reasonably anticipated to remain a heavy industrial area into the foreseeable future, the following potential human and ecological receptors were considered.

5.3.1 Current Receptors

Potential human receptors include the following:

- **Maintenance Workers** - There is potential for limited exposure to dock or ship workers from chains, ropes, anchors, or other equipment that comes into contact with sediment. Potential exposure could occur via dermal contact or incidental ingestion of sediments. Exposures via dermal contact, incidental ingestion, or inhalation could potentially occur during dredging activities when sediments are removed and are no longer covered by water. It is assumed that any dredging activities would be conducted under appropriate health and safety plans that prevent or minimize potential worker exposure. Thus, maintenance worker exposures are considered potentially complete but insignificant and are not evaluated further.
- **Anglers** - Anglers may consume fish caught in the slip that have accumulated sediment-associated contaminants in the Slip. Due to the industrialized nature of the slip, angling is likely very limited but is considered a potential exposure pathway if bioaccumulative chemicals of concern (BCCs) are present.
- **Recreational Use** – Recreational boat traffic is unrestricted in this area and access could potentially occur on an infrequent basis. There is the potential for limited exposure to anchor lines, anchors, and fishing tackle that come into contact with the sediment. This is considered a potentially complete but insignificant pathway and is not evaluated further.

Potential ecological receptors and exposure pathways include the following:

- **Aquatic macroinvertebrates** – Exposure may occur via direct contact with sediment and ingestion of sediment;
- **Fish** – Exposures may occur via direct contact with or ingestion of sediment or ingestion of prey that contain contaminants in tissues via bioaccumulative processes;
- **Birds and mammals** – Exposures may occur via ingestion of forage or prey that contain contaminants in tissues via bioaccumulative processes. Given the heavy industrial nature of the surrounding area, it is unlikely that aquatic-associated mammals would forage within the slip. Although dermal exposure represents a potential exposure pathway for birds (or mammals), this is relatively minor relative to ingestion exposure pathways and is considered insignificant.

5.3.2 Potential Future Receptors

The industrial character of the site is expected to remain unchanged for the foreseeable future. Potential future receptors are anticipated to remain the same as current receptors.

5.3.3 3D Modeling

EVS (Earth Volumetric Studio version 2022.10.2) is a Windows program developed by C Tech Development Corporation that provides advanced interpolation techniques, including three-dimensional (3D) kriging, volumetric calculations, geostatistical analysis, and visualization tools for environmental science disciplines using a graphical icon-driven environment of modules (component programs) that are combined to create customized application or work-flows, with automation using Python 3 (Python programming) scripts.

AECOM built a 3D lithology model with historical and 2022 field-investigation soils cores using an interpolation process called “Geologic Indicator Kriging”, that calculates the most probable lithologic value from data using geostatistical algorithms specialized for discontinuous data such as sediments, into “3D fields” or solids. Additionally, another Kriging algorithm, preferred for continuously varying data such as chemical concentrations, was used to generate 3D fields of analytical concentrations within the boundaries of the lithologic model, thus providing the locations of contaminated sediments. Kriging of the analytical data was performed on the logs of the data, which provides better-realization of non-normally distributed concentrations. The overall application of the 3D model is to aid in determining Remedial Action Objectives (RAOs) and preliminary remediation goals (PRGs) for the slips.

6. Baseline Risk Assessment

6.1 Contaminant Identification

This section provides the approach used and results of a baseline human health risk assessment (HHRA) for the General Mills Slip.

The objectives of the baseline HHRA are to:

- Provide a technically sound risk-based interpretation of the environmental data collected at the General Mills Slip;
- Facilitate efficient regulatory decision-making regarding the need for, and scope of, the remediation; and
- Demonstrate the protection of human health.

6.1.1 Potential Human Receptors

Potential human receptors considered in the CSM (**Section 5**) were maintenance workers, recreational users, and anglers. Exposures for maintenance workers and recreational users were considered potentially complete, but insignificant. The remaining human receptor considered in the CSM was the angler. Although angling is expected be very limited due to the industrialized character surrounding the Slip, recreational boating or fishing is not prohibited in the Slip, and fish ingestion may be a potentially complete pathway if BCCs are present.

Figures 5-1 and **5-2** present the CSM and the transport mechanism and exposure media, respectively.

6.1.2 Chemicals of Potential Concern

Based on the CSM for the General Mills Slip, the medium of interest is fish tissue for human receptors. Fish ingestion was identified as a potentially complete pathway for the anglers if BCCs are present. For purposes of this project, BCCs identified under the *Great Lakes Water Quality Initiative* (40 Code of Federal Regulations [CFR] 132.6, Table 6, Subpart A) were used to select COCs to be further evaluated in the baseline HHRA.

PCBs, dioxins/furans, 4,4’-dichlorodiphenyldichloroethane (DDD), 4,4’-DDE (dichlorodiphenyldichloroethylene), 4,4’-DDT (dichlorodiphenyltrichloroethane), dieldrin, and mercury were detected in sediments of the General Mills Slip and are identified as BCCs in 40 CFR 132.6, Table 6, Subpart A. Because the maximum detected concentration of mercury (0.54 mg/kg) is below the background threshold value (BTV) of 0.59 mg/kg for mercury in the St. Louis River AOC, mercury is not considered a concern within General Mills Slip. Each of the other BCCs are retained for further evaluation in the HHRA. Concentrations of site-related chemicals in fish tissue were derived based on concentrations in sediments, as presented in **Section 6.1.3.1**.

6.1.3 Exposure Assessment

Estimates of intake of COCs are required for quantitative risk characterization. The basic equation used to calculate the human intake of COCs (in terms of dose) for the ingestion pathways (USEPA, 1989) is:

$$DI = C \times \frac{IR \times EF \times ED}{BW \times AT}$$

where:

DI = Daily intake (milligrams [mg] of chemical per kilogram [kg] of body weight per day [mg/kg-day])

C = Concentration of COC (*e.g.*, mg/kg in fish tissue)

IR = Intake rate; the amount of impacted medium contacted over the exposure period (*e.g.*, mg/day for fish)

EF = Exposure frequency; describes how often exposure occurs (days/year)

ED = Exposure duration; describes how long exposure occurs (years)

BW = Body weight; the average body weight over the exposure period (kg)

AT = Averaging time; period over which exposure is averaged (days)

USEPA's online regional screening level (RSL) Calculator was used to derive RSLs in fish tissue that are protective of the fish ingestion pathway. Input parameters used to derive the RSL for fish ingestion were based on the default values provided in the RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search), as shown in **Appendix D**. RSL calculator outputs are also presented in **Appendix D**.

6.1.3.1 Concentration Terms

This HHRA utilized the USEPA guidance "*Calculating the Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*" (USEPA, 2002) and the accompanying ProUCL 5.2 software (USEPA, 2022) to estimate concentration terms necessary in the quantification of COC intakes.

An exposure point concentration (EPC) is the chemical concentration of a COC to which a receptor is likely to be exposed. For the General Mills Slip, concentrations of COCs in the medium of interest (i.e., fish tissue) were derived based on concentrations of COCs in the following sediment data sets:

- Surface: All data from within the 0-1 ft of the surface were included in the surface sediment EPC.
- Subsurface: Samples not included in the surface interval were evaluated as subsurface samples.
- All Intervals: the combined surface and subsurface data.

As a conservative measure, the 95% upper confidence limit of the arithmetic mean (95% upper confidence limit [UCL]) was adopted as the EPC for sediments in the HHRA. When a small sample size (i.e., fewer than eight samples) prevented the use of the ProUCL software to calculate the 95% UCL, the maximum detected concentration was used as the EPC. **Table 6-1** presents summary statistics for the COCs, including the number of samples collected, the frequency of detection, minimum and maximum detected concentrations, statistical approach, and EPCs selected. ProUCL outputs are provided in **Appendix E**.

EPCs for PCBs were calculated for Aroclors 1248, 1254 and 1260. It is noted there was one detection of Aroclor 1262 (in a sample in which no other Aroclors were detected). There were no toxicity data for Aroclor 1262 in the RSL calculator. This represents an uncertainty in the overall risk evaluation.

EPCs for dioxins/furans were calculated as 2,3,7,8-tetracholorodibenzo dioxin (TCDD) equivalents (TEQs) (WHO, 2005). Due to the small sample size (n=3), the maximum detected concentration was used as the EPC rather than the 95% UCL. TEQs were calculated by multiplying the concentration of individual dioxin/furan congeners by a congener-specific toxic equivalency factor (TEF). The TEF is an order of magnitude adjustment that expresses the toxicity of individual dioxin/furan congeners relative to the most toxic form of dioxin, 2,3,7,8-TCDD (World Health Organization [WHO], 2005). TEFs have been derived for humans and mammals as follows:

Compound	WHO (2005) TEF
Chlorinated dibenzo-p-dioxins	
2,3,7,8-TCDD	1
1,2,3,7,8-PeCDD	1
1,2,3,4,7,8-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
1,2,3,4,6,7,8-HpCDD	0.01
OCDD	0.0003
Chlorinated Dibenzofurans	
2,3,7,8-TCDF	0.1
1,2,3,7,8-PeCDF	0.03
2,3,4,7,8-PeCDF	03
1,2,3,4,7,8-HxCDF	0.1
1,2,3,6,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,6,7,8,9-HpCDF	0.01
OCDF	0.0003

TEQs for the General Mills Slip are summarized in **Table 6-2**.

Ingestion of fish tissue is identified in the CSM as the key exposure route for humans. Concentrations of organic COCs in fish fillets were estimated using a biota-sediment accumulation factor (BSAF):

$$C_{fish-fillet} = BSAF * EPC_{sed} * \frac{f_{lipid}}{f_{oc}}$$

where:

$C_{fish\text{-}fillet}$	=	Fish fillet tissue concentration (mg/kg).
$BSAF$	=	Biota-sediment accumulation factor (unitless). Ratio of the lipid-normalized concentration of a chemical in an organism to the organic carbon-normalized concentration of the chemical in sediment (in kg sediment organic carbon/kg lipid)
EPC_{sed}	=	Exposure point concentration in sediments (mg/kg)
f_{lipid}	=	Organism lipid content expressed as a decimal fraction of filet (unitless)
f_{oc}	=	fraction organic carbon - TOC content of sediment expressed as a decimal fraction (unitless).

BSAFs for organic COCs were selected from *The Incidence and Severity of Sediment Contamination in Surface Waters of the United States* (USEPA, 1997a), (page C-4 and Table D-1). BSAFs for the organic COCs are:

- Dioxins/furans: 0.059
- PCBs: 1.85
- 4,4'-DDD: 0.28
- 4,4'-DDE: 7.7
- 4,4'-DDT: 1.67
- Dieldrin: 1.85

An average lipid content of 2.8% (or 0.028) for fish filets was obtained from *The Incidence and Severity of Sediment Contamination in Surface Waters of the United States* (USEPA, 1997a), (page C-16 - the average of lipids in fillets of trophic levels 3 and 4 freshwater demersal and pelagic fish).

Another variable for applying the BSAF is the application of the fraction organic carbon (f_{oc}) in sediments. Note that the average f_{oc} was used rather than a 95% UCL as applied to EPC calculations (which would reduce the projected concentration in fish tissue) as a more conservative estimate. The f_{oc} results for the General Mills Slip were as follows:

- Surface interval: 0.050
- Subsurface interval: 0.033
- Combined intervals: 0.037

6.1.4 Toxicity Assessment

The toxicity assessment provides a framework for characterizing the relationship between the magnitude of exposure to a chemical and the nature and likelihood of adverse health effects that may result from such exposure. In an HHRA, chemical toxicity is typically divided into two categories: carcinogenic and non-carcinogenic effects. Potential health effects are evaluated separately for these two categories, because their toxicity criteria are based on different mechanistic assumptions and associated risks are expressed in different units.

Carcinogenic risks (CR) are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen. In accordance with guidance provided in Risk Assessment Guidance for Superfund (RAGS), Part A (USEPA, 1989), incremental risk of an individual developing cancer associated with the ingestion pathway can be estimated by multiplying the calculated daily intake (DI) that is averaged over a lifetime of exposure, by the chemical-specific slope factor (SF); *i.e.*, CR = DI × SF. CR estimate represents an upper-bound value since the SF is often an upper 95 percent confidence limit of probability of response that is extrapolated from human or experimental animal data using a multistage model.

The potential for non-cancer effects associated with the ingestion pathway was evaluated by comparing an exposure level over a specified time period with a reference dose (RfD) derived for a similar exposure period. This ratio of exposure to toxicity is referred to as a hazard quotient (HQ) and is calculated as HQ = DI ÷ RfD. This HQ assumes there is a level of exposure below which it is unlikely even for sensitive populations to experience adverse health effects. The sum of HQs is termed a hazard index (HI).

The toxicity values used for the HHRA were based on the values provide in USEPA's on-line RSL Calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search). Fish tissue RSLs were derived using USEPA's online Calculator based on a target CR of one in a million (1E-06) and a target HQ of 1. Detailed information regarding the input values and calculated RSLs is presented in **Appendix D**.

6.1.5 Risk Characterization

In the risk characterization step of the HHRA, toxicity and exposure assessments were integrated into quantitative expressions of carcinogenic and non-carcinogenic risks. For this HHRA, a ratio approach was used to estimate the cumulative cancer risk and noncancer hazard using the following equation:

$$Cumulative\ CR\ or\ HI\ = \frac{C_{fish-COC1}}{RSL_{fish-COC1}} + \frac{C_{fish-COC2}}{RSL_{fish-COC2}} + \frac{C_{fish-COCn}}{RSL_{fish-COCn}}$$

where:

$C_{fish\text{-}COCn}$ = Concentration of a COC in fish tissue (micrograms [µg] of a COC in kilogram [kg] fish tissue; [µg/kg]).

$RSL_{fish\text{-}COCn}$ = RSL for each COC (µg/kg).

Derivations of CR and HI for each interval of interest are presented in **Table 6-3** and summarized below.

COC	Estimated Risk and Hazard For Fish Ingestion Pathway	
	HQ or HI	CR
Surface Sediments		
4,4'-DDD	0.006	3E-07
4,4'-DDE	0.009	5E-07
4,4'-DDT	0.004	2E-07
Dieldrin	NA	NA
PCB/Aroclor 1248	NA	NA
PCB/Aroclor 1254	0.2	3E-06
PCB/Aroclor 1260	NA	3E-06
Dioxins/Furans (as TEQ)	1	4E-05
Mercury	0.6	NA
Sum for Surface Sediment	***2***	***4E-05***
Subsurface Sediments		
4,4'-DDD	0.007	3E-07
4,4'-DDE	0.003	2E-07
4,4'-DDT	0.10	6E-06
Dieldrin	0.005	2E-06
PCB/Aroclor 1248	NA	3E-05
PCB/Aroclor 1254	0.8	1E-05
PCB/Aroclor 1260	NA	1E-05
Dioxins/Furans (as TEQ)	NA	NA
Mercury	2	NA
Sum for Subsurface Sediment	***3***	***6E-05***
Sediments (All Intervals)		
4,4'-DDD	0.008	4E-07
4,4'-DDE	0.01	7E-07
4,4'-DDT	0.08	5E-06
Dieldrin	0.005	1E-06

COC	Estimated Risk and Hazard For Fish Ingestion Pathway	
	HQ or HI	CR
PCB/Aroclor 1248	NA	4E-07
PCB/Aroclor 1254	0.5	8E-06
PCB/Aroclor 1260	NA	8E-06
Dioxins/Furans (as TEQ)	1	5E-05
Mercury	1	NA
Sum for Sediments (All Intervals)	***4***	***9E-05***

NA: Not applicable; chemicals were not detected or analyzed in the sediment interval of interest, or no reference dose or cancer slope factor.

HIs calculated for the fish ingestion pathway range from 2 (surface), 3 (subsurface), to 4 (combined intervals). The greatest contributor to potential health hazards were dioxins/furans and mercury.

Cumulative CRs for the fish ingestion pathway all exceeded 1E-05 but were within USEPA's acceptable CR range of 1E-06 to 1E-04. The greatest contributors to potential cancer risks were associated with dioxins/furans and PCBs.

6.1.6 Uncertainty Analysis

Assumptions were made within the multiple steps of the risk assessment process, introducing some degree of uncertainty into the HHRA. Much of the potential uncertainty is discussed in qualitative terms because there is generally not enough information for most uncertainties to assign numerical values. The following sections discuss uncertainties with respect to:

- Data Collection and Evaluation,
- Exposure Assessment,
- Toxicity Assessment, and
- Risk Characterization.

6.1.6.1 Data Collection and Evaluation Uncertainty

Analytical data used in the HHRA are subject to uncertainty associated with sampling and analysis and subsequent evaluation. Uncertainties include:

- Data were collected from locations assumed to be representative of areas where chemicals may contribute to potential exposures. Uncertainty may be introduced through biases in sampling rather than from a truly random sampling approach. Incorporating biased sampling locations into exposure estimates is likely to result in an overestimate of potential risks because the data are not randomly collected. This subsequently contributes to bias in statistical estimates of exposure, which assume random sample collection.
- Random variability of samples and lack of homogeneity of the media may result in either an over- or under-estimate of actual exposure concentrations.
- Samples were analyzed using USEPA methodologies; however, sample analysis is subject to uncertainties associated with precision, accuracy, and detection of chemicals at low concentrations. Differences between how accurately measured concentrations reflect actual concentrations could lead to an over- or underestimate of exposures and potential risks.
- Chemicals that were non-detect ("U" qualified) in all samples, and chemicals that were only detected at concentrations below their respective health-based screening criteria, were not retained as COCs.

While it is unlikely that major contaminants have been excluded on this basis, exclusion of these non-detected chemicals could result in an underestimation of risk.

- The risk drivers in the HHRA included dioxins/furans and pesticides (particularly 4,4'-DDT). Both dioxins and pesticides were represented by very few samples. Aroclor 1248 was a primary contributor to risks as well but was represented by only a single detection. The lack of data for these constituents contributes to uncertainty in the overall evaluation.

6.1.6.2 Exposure Assessment Uncertainty

The 95% UCL of the mean (or the maximum) was calculated and used as the exposure point concentration. The statistical approach applied is dependent on the frequency of detection, number of data values, and distribution of the data within the dataset. The accuracy of these numbers in reflecting exposure depends on how well the data represents the site. Calculation of the 95% UCL was only applied to datasets containing eight or more samples. In general, the more samples collected from an area, the lower the associated uncertainty when calculating an EPC. For datasets with insufficient data to calculate a 95% UCL, the maximum concentration was used as the EPC. The use of the 95% UCL of the mean (or the maximum concentration) results in a high level of confidence that risks are not underestimated but may tend to over-estimate actual exposures and associated risks.

When calculating EPCs in ProUCL, it is assumed that a COC not detected in a sample may be present at some unknown concentration below the reporting limit. ProUCL makes assumptions about probable concentrations for these non-detect samples, based on factors such as the apparent distribution patterns (normal, lognormal, etc.) of the overall data set and applying approaches such as the Kaplan-Meier (KM) method, regression on order statistics methods and substitution methods. Depending on the characteristics of the dataset, these concentrations are used in the calculation of the 95% UCL of a chemical concentration. This approach may lead to an over-estimation of risks when sample quantitation limits are high, actual chemical concentrations are very low, or if the sample population does not fit the assumed distribution pattern.

BSAFs reported in *The Incidence and Severity of Sediment Contamination in Surface Waters of the United States* (USEPA ,1997a) were used in derivation of organic BCC concentrations in fish tissue from bulk sediment concentrations. The BSAF for mercury was selected from the *Mercury Study Report to Congress* (USEPA, 1997b). There is uncertainty in the accuracy of BSAFs relative to application in the General Mills Slip, which could lead to an over- or underestimate of potential risks.

The fish ingestion scenario assumed that 100 percent of the fish ingested originated from the General Mills Slip. It is extremely unlikely, particularly given the industrial nature of the Slip, that the entirety of an angler's diet would be obtained exclusively from the Slip. This is a conservative assumption that leads to an overestimation of site risks.

6.1.6.3 Toxicity Assessment Uncertainty

In general, the available scientific information is insufficient to provide a thorough understanding of all the potential toxic properties of chemicals to which humans may be exposed. Consequently, varying degrees of uncertainty surround the assessment of adverse health effects in the exposed populations. Sources of uncertainty related directly to toxicity data include:

- Use of dose-response data from experiments on homogeneous, sensitive animal populations to predict effects in heterogeneous human populations with a wide range of sensitivities.
- Extrapolation of data from: 1) high dose animal studies to low dose human exposures; 2) acute or subchronic toxicity studies to chronic exposure scenarios; and 3) one exposure route to another (e.g., from ingestion to dermal absorption).
- Use of single-chemical test data that does not account for multiple exposures or synergistic and antagonistic responses.

- Toxicity values (RfD and SFs) are predicted values and have incorporated factors to provide a margin of safety for even the most sensitive subpopulations and likely over-estimate potential risks for all receptors evaluated in this risk assessment.

Based on these sources of uncertainty, a high degree of uncertainty may be associated with the toxicity values used in this risk assessment. In an attempt to minimize the consequences of uncertainty, USEPA typically relies on a conservative approach in determining toxicity values. The current USEPA toxicity values used in this risk assessment are likely to over-estimate the potential risk and hazard.

6.1.6.4 Risk Characterization Uncertainty

PCBs and mercury are also present in background sediments. Dioxins/furans and pesticides are likely present in background sediments as well but are not quantified here. Using the procedures applied in this HHRA, background PCB risks (using 95% UCLs reported in WDNR, 2022a) would be 3E-06 and an HQ of 0.2. Hazards quotients associated with mercury would be 1. This is significant in the ultimate interpretation of potential risks. The maximum concentration of mercury (0.67 mg/kg) was only marginally above the BTV (0.59 mg/kg). The background 95% UCL for mercury is 0.18 mg/kg, whereas the maximum 95% UCL in the General Mills Slip is 0.224 mg/kg. It is unlikely that mercury in the General Mills Slip is a significant contributor to risk above background levels.

Uncertainties exist in each step of the risk assessment process, and these uncertainties are often magnified in the final risk characterization. The final quantitative estimates of risk may be one or several orders of magnitude different from the actual potential risk associated with a given exposure. Because of the conservative approaches used in each step, the overall results of this risk assessment are most likely to overestimate the potential site risks.

6.1.7 Human Health Risk Assessment Conclusions

Human receptors evaluated in the HHRA were anglers consuming fish from the General Mills Slip. Chemicals of concern included PCBs, pesticides, dioxins/furans, and mercury. Mercury contributions to hazards were essentially at background levels. Interpretation of risks associated with pesticides and dioxins/furans was limited to a very few samples, with EPCs represented as maximum concentrations. The HIs as presented in this HHRA suggest potential hazards because HIs exceeded one. However, hazards associated with mercury were approximately 1 in background. When background is considered, cumulative hazards from 1 (surface) to 2 (subsurface and combined intervals). Cumulative cancer risks exceeded 1E-05 in all sediment intervals but were within USEPA's acceptable CR range of 1E-06 to 1E-04.

6.2 Ecological Risk Assessment

Relevant ecological assessment endpoints were developed based on the CSM presented in **Section 5**. An assessment endpoint is the explicit expression of an environmental value that is to be protected (USEPA 1992, 1997c, 1998). Two elements are needed to define an assessment endpoint: 1) the valued ecological entity (e.g., a local population of a species, a functional group of species), and 2) the property or attribute of that entity which is potentially at risk and important to protect. A measurement endpoint is a measurable ecological characteristic that is related to the valued characteristic chosen as the assessment endpoint. Measurement endpoints represent the lines-of-evidence used to evaluate the assessment.

The assessment endpoints and associated measurement endpoints for the General Mills Slip ecological risk assessment (ERA) are described below:

- ***Viability and Function of the Benthic Macroinvertebrate Community*** - Invertebrate communities can comprise a large portion of the base of the food chain for aquatic ecosystems. Impacts to sediment invertebrate communities may have direct effects (e.g., loss or reduction of forage) and indirect effects (transfer of bioaccumulative compounds) on higher trophic-level organisms. Sediment invertebrates process organic material and are important in nutrient and energy transfer as well as to the overall ecosystem function. The measurement endpoint for the benthic macroinvertebrate community will be comparison of sediment exposure concentrations with toxicity reference values (TRVs), specifically, the TEC, MEC, and PEC. An additional line of evidence for the benthic macroinvertebrate community more directly associated with actual measured effects in sediments are sediment toxicity tests conducted with *Chironomus dilutus* and *Hyallela azteca*. Another line of evidence to support interpretation of this assessment endpoint is sampling of the benthic macroinvertebrate community within the Slip.

- ***Viability and Function of the Fish Community*** - Fish communities play a key role in ecosystem functions such as energy flow, nutrient cycling, and organic matter accumulation, and are an important food resource for higher trophic level species. The measurement endpoint for the fish community will be a comparison of sediment exposure concentrations with critical body residues (CBR) for BCCs.
- ***Survival, Growth, and Reproduction of Invertivorous and Carnivorous Birds*** - Impacts to invertivores may allow species of potentially harmful aquatic insects to obtain higher population levels than would typically occur in a system that was not impacted. Invertivores are important in nutrient processing and energy transfer between the aquatic and terrestrial environment. In an aquatic environment carnivores refer primarily to piscivores. Piscivores are carnivorous animals that feed primarily on fish, thereby helping to regulate fish populations. Predators regulate prey density, species abundance, and diversity, and impacts to piscivores could cause detrimental fish population changes and/or shift in fish community assemblage. The measurement endpoint for insectivorous and carnivorous birds first will be comparison of BCC exposure concentrations with wildlife-based sediment-screening levels.

6.2.1 Contaminant Identification

Chemical concentrations in sediments compared to ecological sediment screening values are presented in **Table 4-1**. Ecological screening values considered were the TEC, MEC, and PEC (WDNR, 2022a). Using the TEC as the most conservative value for screening purposes, the following constituents were selected as COCs because the maximum detected sediment concentration exceeded the TEC and background:

- Antimony
- BaP
- Cadmium
- Copper
- Dioxin/Furans
- Lead
- Manganese
- Mercury
- Nickel
- Total DDT
- tPAHs
- Total PCBs
- Tributylin
- Zinc

Dibenzofuran, antimony, cadmium, manganese, dieldrin, and total DDT were not listed as chemicals of interest for the General Mills Slip in the SOW; however, they were retained for this evaluation as the maximum detected concentrations exceeded both screening (TEC) and background values (where available).

Comparisons with TECs (or other sediment criteria such as the MECs or PECs) do not address the potential bioaccumulative character of some constituents. PCBs, dioxins/furans, 4,4’-DDD, 4,4’-DDE, 4,4’-DDT, dieldrin and mercury were detected in sediments of the General Mills Slip and are identified as BCCs in 40 CFR 132.6, Table 6, Subpart A. Each of these constituents is retained for further evaluation in the ERA for evaluation of the fish community and invertivorous and carnivorous birds.

6.2.2 Exposure Assessment

Two types of exposures are evaluated in this ERA:

- Direct exposures through contact with sediment (benthic macroinvertebrates); and
- Indirect exposure via bioaccumulation of BCCs in fish tissue and ingestion of contaminated prey/forage (birds).

Direct exposures are evaluated by comparing media concentrations with direct exposure TRVs, which are also expressed as media concentrations. For higher trophic-level receptors (birds), sediment concentrations were compared with sediment screening values for wildlife, which were calculated based on concentrations of COCs in sediment and subsequent ingestion of dietary items (prey) projected to an ingested dose. Although ingestion is a complete pathway for benthic macroinvertebrates, it is not evaluated in the ERA.

6.2.2.1 Exposure Point Concentrations

EPCs are the chemical concentrations of COCs to which an ecological receptor is exposed when contact is made with a specific environmental medium. For this evaluation, EPCs are expressed as the 95% UCL (or the maximum detected concentration in the event insufficient samples were available for statistical analysis). As with the HHRA, the EPCs were defined for the following sediment depth intervals:

- Surface: All data within the 0-1 ft depth interval were included in the surface sediment EPC.
- Subsurface: Samples not included in the surface interval dataset were evaluated as subsurface samples.
- All Intervals: the combined surface and subsurface data.

The 95% UCL values provided by WDNR (2022) were used where available. Values were not provided for cadmium, PCB Aroclors 1248 and 1254, or dioxins/furans for birds. Additionally, UCLs were recalculated for tPAHs. 95% UCLs were calculated for these constituents using data from the General Mills Slip sediment dataset using USEPA's ProUCL Version 5.2 software (USEPA, 2022). Where samples were analyzed using more than one analytical method, the higher result was used.

EPCs for PAHs were calculated using "U"=0, "U"=1/2 method detection limit, and "U"=1/2 reporting limit. For risk calculations, hazard quotients were developed using "U"=1/2 the reporting limit.

For field duplicates, the following approach was followed when 95% UCLs were not included in WDNR (2022):

- If both the parent sample and the field duplicate were detections, the higher value was selected.
- If one sample was reported as a detection and the other a non-detect, the detected value was selected.
- If both samples were reported as non-detects, the sample with the lower reporting limit was selected.

Summary statistics and EPCs are presented in **Table 6-1**. ProUCL Outputs are provided in **Appendix E**.

The measurement endpoint for the fish community assessment endpoint was based on fish tissue concentrations. The fish tissue concentration was estimated based on the whole body (rather than the fillet as in human health evaluation). As in the HHRA, concentrations of organics in whole-body fish were estimated as follows:

$$C_{fish-WB} = BSAF * EPC_{sed} * \frac{f_{lipid}}{f_{oc}}$$

where:

$C_{fish\text{-}WB}$ = Whole-body fish tissue concentration (mg/kg)

BSAF - Ratio of the lipid-normalized concentration of a chemical in an organism to the organic carbon-normalized concentration of the chemical in sediment (in kg sediment organic carbon/kg lipid)

EPC_{sed} = Exposure point concentration in sediments (mg/kg)

f_{lipid} = organism lipid content in tissue expressed as a decimal fraction (e.g., 5 percent = 0.05)

f_{oc} = fraction organic carbon - TOC content of sediment expressed as a decimal fraction.

As in the HHRA, BSAFs for organic COCs were selected from *The Incidence and Severity of Sediment Contamination in Surface Waters of the United States* (USEPA, 1997a), (page C-4 and Table D-1). BSAFs for the organic COCs are:

- Dioxins/furans: 0.059
- PCBs: 1.85
- 4,4'-DDD: 0.28
- 4,4'-DDE: 7.7
- 4,4'-DDT: 1.67
- Dieldrin: 1.85

For fish, the average lipid concentration was obtained from *The Incidence and Severity of Sediment Contamination in Surface Waters of the United States* (USEPA 1997a), (page C-16 - the average of wholebody lipids of freshwater demersal and pelagic fish). The average lipid concentration was 5%, or 0.05 expressed as fraction lipid.

The other variable for applying the BSAF is the fraction organic carbon in sediments. The average fraction organic carbon was used rather than a 95% UCL as applied to EPC calculations as a more conservative estimate. As with the HHRA, the f_{oc} results for the General Mills Slip were as follows:

- Surface interval – 0.050
- Subsurface interval – 0.033
- Combined intervals – 0.037

6.2.2.2 Ingestion Exposures

The principal exposure pathway for higher-level wildlife (birds and mammals) is through ingestion. Ingestion exposures are based on an estimate of the dose, which is subsequently related to anticipated responses. Sediment screening levels have been developed for potentially bioaccumulative COCs in this evaluation using wildlife ingestion models.

6.2.3 Toxicity Assessment

6.2.3.1 Benthic Invertebrate Community – Toxicity Reference Values

TRVs selected for evaluation of the benthic invertebrate community are the consensus-based SQGs from WDNR (2003). The TEC was selected as a lower bound TRV and the PEC was selected as an upper bound TRV. The MEC is the midpoint between the TEC and PEC. The TEC as defined by MacDonald et al. (2000) as the concentration below which adverse effects are unlikely to occur. The PEC is the concentration above which adverse effects are expected to likely occur. Although the WDNR (2003) guidance recommends TOC-normalized concentrations for nonpolar organics, WDNR has since recommended against applying TOC-normalized concentrations to the SQGs.

6.2.3.2 Benthic Invertebrate Community – Benthic Toxicity Tests

Several sediment toxicity tests have been conducted in associated with the General Mills Slip during two reported events. Each is discussed below.

Site Characterization Report Assessment of Contaminated Sediment Superior Waterfront Characterization. St. Louis River and Bay Area of Concern, Superior, Wisconsin (EA 2016)

Locations SW-SLB04-SURF and SW-SLB05-SURF were analyzed for acute and chronic toxicity analyses using the 10-day *Chironomus riparius* (freshwater amphipod) and the 28-day *H. azteca* (freshwater midge) bioassays.

The results of the *C. riparius* sediment toxicity tests indicated survival was less than controls in both SW-SLB04-SURF and SW-SLB05-SURF. No significant differences in growth were observed.

In the *H. azteca* tests, survival was not significantly different from controls in either sample. Growth was significantly less than controls in SW-SLB05-SURF. No significant differences in fecundity were observed.

***2021 Site Investigation Report Characterization of Sediments in the North End District and Clough Island St Louis River and Bay Area of Concern* (EA 2021)**

Three samples (ND20-GM-02, ND20-GM-04, ND20-GM-08) were selected for toxicity testing to evaluate acute and chronic toxicity bioassays. Toxicity testing included 28-day sediment toxicity tests with *H. azteca* and 10-day *C. dilutus* evaluating the effects on survival and growth of the test organisms compared to control and/or reference locations. Tests were also conducted on samples collected at four reference locations (KBREF2, LFREF3, SBREF4, and SLBREF1). The *C. dilutus* and *H. azteca* toxicity test results were statistically analyzed to evaluate whether any of the site sediments were significantly different (p=0.05) from the control or reference sediment.

In the *C. dilutus* tests, survival in each of the three samples was significantly different from the laboratory controls but was not significantly different from the reference controls. Growth in samples ND20-GM-02 and ND20-GM-04 was significantly different from the laboratory controls but was not significantly different from the reference controls. There were no significant differences in growth in sample ND20-GM-08 with respect to laboratory or reference controls.

In the *H. azteca* tests, survival and growth at ND20-GM-02 were significantly different from laboratory controls and two reference controls. At ND20-GM-04 survival and growth were significantly different from laboratory controls and all reference controls. At ND20-GM-08 survival and growth were significantly different from laboratory controls and three reference controls. No significant differences in fecundity were observed at any of the three site locations.

Based on the toxicity results from each of these reports, there are effects on survival and growth of benthic invertebrates in the General Mills Slip.

6.2.3.3 Fish Tissue Residue TRVs

PCB Tissue TRVs

Fish tissue PCB TRVs were based primarily from former risk assessments conducted by USEPA. No observed adverse effect level (NOAEL) TRVs for PCB tissue concentrations used by USEPA in the Hudson River PCB risk assessment (USEPA, 2000) ranged from 1.9 to 5.25 mg/kg. The TRV of 1.9 mg/kg was from Hansen et al. (1974) and consisted of a 28-day flow-through bioassay with Aroclor 1254 using the sheepshead minnow (*Cyprinodon variegatus* – a brackish water minnow). The TRV of 5.25 mg/kg was from the United States Army Corps of Engineers (USACE) (USACE, 1988) and is based on a 16-week exposure to PCB-contaminated sediment using the fathead minnow (*Pimephales promelas* – a freshwater minnow).

In USEPA's Housatonic River risk assessment (USEPA, 2003), an alternate approach using multiple metrics was applied for selecting an acceptable tissue PCB concentration. These metrics included:

- average concentration for all effects reported in the studies used;
- the highest NOAEL reported in the studies used; and
- the geometric means of paired NOAEL/lowest observed adverse effect levels (LOAELs).

Using this approach, a whole body tissue concentration of 31 mg/kg wet weight (ww) was recommended as protective of reproductive and developmental endpoints for fish.

The USACE (1988) study is believed to be the more appropriate study for application in this assessment due to the extended study duration and the species utilized within the study. The fathead minnow is a freshwater minnow, (consistent with waters of the St. Louis River and Lake Superior), whereas the sheepshead minnow is a brackish water species not native to Wisconsin. Although these values are lower than that selected by USEPA for application on the Housatonic River, the selected values provide a level of conservatism and also provide both lower and upper bounds to generate a range for interpretation. The fish tissue residues TRVs selected for total PCBs are:

NOAEL TRV = 5.25 mg/kg ww

LOAEL TRV = 13.7 mg/kg ww

Dioxin/Furan Toxic Equivalents (TEQ) Tissue TRVs

The relative potency of the various dioxin/furan congeners relative to 2,3,7,8-TCDD is used to calculate the potential toxicity of the dioxin/furan mixture. As with human health, TCDD TEQs were calculated by multiplying the concentration of individual dioxin/furan congeners by a congener-specific TEF. TEFs derived for birds and fish are as follows:

Compound	Van den Berg et al. (1998) Birds	Van den Berg et al. (1998) Fish
Chlorinated dibenzo-p-dioxins		
2,3,7,8-TCDD	1	1
1,2,3,7,8-PeCDD	1	1
1,2,3,4,7,8-HxCDD	0.05	0.5
1,2,3,6,7,8-HxCDD	0.01	0.01
1,2,3,7,8,9-HxCDD	0.1	0.01
1,2,3,4,6,7,8-HpCDD	<0.0001	0.001
OCDD	0.0001	<0.0001
Chlorinated Dibenzofurans		
2,3,7,8-TCDF	1	0.05
1,2,3,7,8-PeCDF	0.1	0.05
2,3,4,7,8-PeCDF	1	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1

Compound	Van den Berg et al. (1998) Birds	Van den Berg et al. (1998) Fish
1,2,3,4,6,7,8-HpCDF	0.01	0.01
1,2,3,6,7,8,9-HpCDF	0.01	0.01
OCDF	0.0001	<0.0001

TCDD TEQ TRVs developed by USEPA for the Hudson River Risk Assessment (USEPA, 2000) were based on lipid-normalized concentrations derived primarily from egg studies. NOAEL and LOAEL TRVs selected for all evaluated fish species were 8 µg TEQ/kg lipid and 18 µg TEQ/kg lipid, respectively. These TRVs were based on eggs of the channel catfish and early life stage mortality (Elonen et al., 1998). A review of the data reported in USEPA (2000) indicate these were equivalent to whole-body fish tissue concentrations of 0.385 µg TEQ/kg ww for the NOAEL and 0.435 µg TEQ/kg ww to 0.855 µg TEQ/kg ww for the LOAEL.

In USEPA's Housatonic River risk assessment (USEPA, 2003), a similar approach was used for deriving TEQ residue thresholds. An effects threshold for eggs of 100 ng/kg TEQ (0.1 µg/kg) was selected for Housatonic River fish. This concentration represented the level at which early life stage mortality started to increase in several species. USEPA (2003) indicated that although mortality rates at 100 ng/kg are not statistically significant, the gradient in toxicity is fairly steep above 100 ng/kg, such that approximately 50% mortality to several species is observed at 1,000 ng TEQ/kg (1 µg/kg ww). USEPA scaled the threshold egg concentrations to adult female whole-body concentrations using a conversion factor that corrected for the relative difference in lipids between eggs and adults. A whole-body tissue concentration of 0.05 µg/kg ww was considered to be protective.

USEPA (2003) suggests a higher incidence of mortality at tissue concentrations above 1 µg/kg ww. USEPA (2000) suggests an upper bound TRV of 0.435 µg/kg ww to 0.855 µg/kg ww (as applied on a tissue concentration rather than lipid-normalized values). A conservative upper-bound TRV of 0.435 µg/kg ww was selected for this ERA for preliminary evaluation. In summary, the following TRVs were selected for evaluation of TEQs in fish tissue:

NOAEL TRV = 0.1 µg/kg ww

LOAEL TRV = 0.435 µg/kg ww

Total DDTr[3] Tissue TRVs

Beckvar and Lotufo (2011) compiled tissue residue effects on fish and invertebrates. Critical body residues (CBR) based on lethality in early life-stage fish ranged from 0.89 mg/kg ww to 24 mg/kg, with a median of 2.38 mg/kg. In juvenile and adult fish, CBR values ranged from 0.29 to 113 mg/kg ww with a median of 1.27 mg/kg. The lower end of the range for early life stage and juvenile/adult fish were selected as lower and upper bound TRVs for total DDTr:

NOAEL TRV = 0.29 mg/kg ww

LOAEL TRV = 0.89 mg/kg ww

Dieldrin Tissue TRVs

Beckvar and Lotufo (2011) also compiled tissue residue effects for dieldrin on fish. Very limited data were identified. CBRs based on lethality in juvenile fish ranged from 0.2 mg/kg ww to 5.9 mg/kg ww. Juvenile rainbow trout exposed to dieldrin in water for 16 weeks had whole-body residues of 0.2 mg/kg and increased mortality compared to control fish, but no statistics were provided (Shubat and Curtis 1986). Juvenile rainbow trout had estimated whole-body dieldrin residues of 5.9 mg/kg in the treatment group

[3] Sum of DDD, DDE and DDT

with 100% mortality after dietary exposure (Shubat and Curtis 1986). Behavioral effects in goldfish and bluegill were noted at whole-body concentrations of approximately 3.7 mg/kg (Oakstatter and Weiss 1967). The lower end of the values above was selected as a lower bound TRV for dieldrin. Due to the paucity of information, an upper-bound TRV was not selected.

NOAEL TRV = 0.2 mg/kg ww

Mercury Tissue TRVs

Effects levels for mercury in fish tissue were obtained from Dillon et al. (2010). The range of observed concentrations in bottom-dwelling and predatory species (~0.1–0.2 mg/kg) in this study were reportedly considered average US background residues for mercury in fish. In the juvenile/adult fish model, the modelled percent injury at 0.3 mg/kg was estimated at 8.2%. The percent injury at 1 mg/kg was estimated at 24.0%. This range was selected for mercury TRVs:

NOAEL TRV = 0.3 mg/kg ww

LOAEL TRV = 1.0 mg/kg ww

6.2.3.4 Birds - Toxicity Reference Screening Values for Sediments

Los Alamos National Laboratory (LANL) has developed sediment screening values for aerial insectivores (N3B, 2020) for each of the BCCs being evaluated:

Constituent	NOAEL TRV	LOAEL TRV
Mercury	0.017	0.17
4,4'-DDD	8.2	42
4,4'-DDE	140	710
4,4'-DDT	470	1300
Dieldrin	15	820
PCB Aroclor 1248	53	530
PCB Aroclor 1254	53	530
PCB Aroclor 1260	1100	1600
TEQ Birds	0.33	2.2

All units in µg/kg, except for mercury, which is in mg/kg.

Note that LANL did not identify dioxin/furan TRVs for birds; however, the following sediment TRVs were identified for 2,3,7,8-TCDD for mammals (an insectivorous bat):

NOAEL TRV = 0.33 µg/kg/day

LOAEL TRV = 2.2 µg/kg/day

Oral TRVs used in this derivation were 5.62E-04 µg/kg/day for the NOAEL and 3.76E-03 µg/kg/day for the LOAEL. In the Hudson River risk assessment, USEPA (2000) selected oral TRVs for the tree swallow (an aquatic-associated aerial insectivorous bird), the belted kingfisher, and great blue heron (piscivores) of 1.4E-03 µg/kg/day µg/kg/day and 1.4E-02 µg/kg/day for NOAEL and LOAEL oral TRVs, respectively.

The results of the Hudson River risk assessment indicate that birds appear to be less sensitive to dioxins/furans than mammals. The sediment TRVs from LANL for insectivorous mammals will be used in a preliminary approach to evaluate potential risk to birds.

6.2.4 Ecological Risk Characterization

Risk characterization has two principal components: risk estimation and risk description (USEPA, 1997c). These two components are bridged by an uncertainty analysis. Risk estimation uses the data analysis to calculate a range of potential risks for each COC. The risk description provides an interpretation and discussion based on the risk estimates and uncertainty analysis. The risk estimates and uncertainties are evaluated in interpreting the degree of confidence in the risk estimates. This discussion is intended to assist risk managers in judging the likelihood and ecological significance of the estimated risks.

6.2.4.1 Risk Estimation

The primary line of evidence for estimating risk consists of comparison of the exposure concentration to a TRV. This ratio is referred to as the hazard quotient (HQ). The HQ for each COC and community or representative receptor is calculated by dividing the EPC by the TRV. A range of HQs is developed to portray a range of potential ecological risks. The HQ at the lower end of the range is calculated with the lower-bound TRV and the HQ at the upper end with the upper-bound TRV.

Viability and Function of the Benthic Macroinvertebrate Community

Benthic invertebrate HQs are presented in **Table 6-4**. In the surface, subsurface, and combined intervals, several COCs exceeded an HQ of 1, as summarized below:

COC	Ecological Hazard Quotients for the Benthic Macroinvertebrate Community		
	TEC HQ	MEC HQ	PEC HQ
Surface Sediments			
Total DDTr[1]	23	0.4	0.2
tPAHs[2]	4	1	0.3
BaP	2	0.4	0.2
Total PCBs[3]	0.5	0.1	0.04
Manganese	2	0.9	0.6
Tributyltin	23	7	4
TEQ Fish[4]	59	5	2
Subsurface Sediments			
Total DDTr[1]	51	1	0.5
tPAHs[2]	16	2	1
BaP	15	3	2
Dibenzofuran	3	1	0.7
Total PCBs[3]	6	1	0.6
Copper	3	0.9	0.6
Lead	4	2	1
Zinc	2	0.9	0.6
Tributyltin	37	11	7
TEQ Fish[4]	NA	NA	NA
Sediments (All Intervals)			
Total DDTr[1]	51	0.9	0.5
tPAHs[2]	14	2	1
BaP	19	4	2
Dibenzofuran	2	0.9	0.6
Total PCBs[3]	3	0.5	0.3
Lead	2	0.7	0.4
Tributyltin	29	9	5
TEQ Fish[4]	59	5	2

[1] Sum of DDD, DDE, and DDT.
[2] tPAHs based on sum of 18 PAHs calculated using 1/2 reporting limit for non-detects.
[3] Total PCBs calculated as sum of Aroclors 1248, 1254, and 260.
[4] TEQ Fish - 2,3,7,8-dioxin TEQ based on Van den Burg (1998).

NA – Not available.

Only tributyltin and TEQ_{fish} exceed the PEC HQs of 1 in the surface interval. In addition, total DDTr, tPAHs, BaP, and manganese exceed the TEC HQs of 1.

In the subsurface interval, benzo(a)pyrene and tributyltin exceed the PEC HQs of 1. In addition, tPAHs and lead exceed the MEC HQs of 1 and total DDTr, dibenzofuran, total PCBs, copper, and zinc exceed the TEC HQs of 1.

For all intervals combined, benzo(a)pyrene, tributyltin, and TEQ_{fish} exceed the PEC HQs of 1. In addition, tPAHs exceeds the MEC HQ of 1, and total DDTr, dibenzofuran, total PCBs, and lead exceed the TEC HQs of 1.

Results of benthic invertebrate toxicity tests were discussed in **Section 6.2.3**. Results suggest that there are adverse effects on survival and growth of benthic invertebrates due to exposure to General Mills Slip sediment.

Viability and Function of the Fish Community

HQs projected for BCCs in fish tissue are presented in **Table 6-5** and are summarized below. All LOAEL HQs were below one, except for mercury. The LOAEL HQ for mercury was equal to one in the subsurface; however, the LOAEL HQ for background mercury is also equal to one.

COC	Ecological Hazard Quotients for the Fish Community	
	NOAEL HQ	LOAEL HQ
Surface Sediments		
Mercury	1	0.4
Total DDTr[1]	0.3	0.1
Total PCBs[2]	0.01	0.004
TEQ Fish[3]	0.03	0.01
Subsurface Sediments		
Mercury	3	1
Total DDTr[1]	2	0.6
Total PCBs[2]	0.1	0.03
TEQ Fish[3]	NA	NA
Sediments (All Intervals)		
Mercury	3	0.8
Total DDTr[1]	0.4	0.1
Total PCBs[2]	0.05	0.02
TEQ Fish[3]	0.02	0.01

[1] Sum of DDD, DDE, and DDT.
[2] Total PCBs calculated as sum of Aroclors 1248, 1254, and 260.
[3] TEQ Fish - 2,3,7,8-dioxin TEQ based on Van den Burg (1998).
NA – Not available.

Survival, Growth, and Reproduction of Invertivorous and Carnivorous Birds

HQs projected for birds exposed to BCCs are presented in detail in **Table 6-6** and are summarized on the next page. LOAEL HQs ranged from 2 to 3 for total DDTr in the subsurface and surface intervals, respectively, were equal to or below one. The LOAEL HQ for total PCBs was equal to 1 in the subsurface and combined intervals. The LOAEL HQ was also 1 for mercury in subsurface and combined intervals; however, the LOAEL HQ for background mercury is also equal to one.

COC	Ecological Hazard Quotients for the Invertivorous and Carnivorous Birds	
	NOAEL HQ	LOAEL HQ
Surface Sediments		
Mercury	4.7	0.5
4-4'-DDD	13	3
Total DDTr[1]	13	3
Total PCBs[2]	0.4	0.06
TEQ Birds[3]	0.2	0.02
Subsurface Sediments		
Mercury	13	1
4-4'-DDD	10	2
Total DDTr[1]	10	2
Total PCBs[2]	10	1
TEQ Birds[3]	NA	NA
Sediments (All Intervals)		
Mercury	11	1
4-4'-DDD	13	3
Total DDTr[1]	14	3
Total PCBs[2]	10	1
TEQ Birds[3]	0.2	0.02

[1] Sum of DDD, DDE, and DDT.
[2] Total PCBs calculated as sum of Aroclors 1248, 1254, and 260.
[3] TEQ Fish - 2,3,7,8-dioxin TEQ based on Van den Burg (1998).
NA – Not available.

6.2.4.2 Uncertainty Analysis

As discussed in the HHRA, assumptions were made within the multiple steps of the risk assessment process, introducing some degree of uncertainty into the ERA. Much of the potential uncertainty is discussed in qualitative terms because there is generally not enough information for most uncertainties to assign numerical values. Many of the uncertainties previously discussed for the HHRA are also common within the ERA. Uncertainties more specific to the ERA are discussed below.

Exposure Assessment Uncertainty

The exposure assessment is based on assumptions concerning the types of receptors likely to be present, patterns of behavior leading to exposure, and the estimate of exposure concentrations. Uncertainties include:

- Selection of COCs was based on a comparison of the maximum detected concentration with conservative ecological screening values and background. The potential that a chemical actually is present but not detected due to elevated reporting limits could contribute to an underestimate of potential risks.
- Selection of receptors requires an understanding of the complex interactions in an ecosystem, including abiotic processes and interactions between organisms. Uncertainties are associated with the representativeness of the selected receptors as sensitive species and as key organisms in the functioning of the ecosystem. Mammals were not considered as potential receptors in the ERA due to the industrial nature of the Slip. This could lead to an underestimate of potential risks to mammalian receptors, if in fact, they are present and foraging in the Slip.
- Generalized and conservative assumptions are made about the behavior of the receptor(s) in the environment in terms of diet, activity, mobility, and seasonality. There were no adjustments made to account for either mobility, foraging area, or seasonality within the ERA. Receptors were assumed to forage exclusively within the General Mills Slip. Presumably, the conservativeness of the assumptions

is more likely to over-estimate rather than under-estimate risks. For birds, the size of the slip is likely smaller than the foraging range, particularly given the industrial nature of the slip. The approach applied in this evaluation assumes that the foraging range is limited to the slip, which likely overestimates potential risks.

- Exposures and subsequent risk estimates were generally evaluated on a chemical-by-chemical- basis for direct exposures for inorganics and some organics. This approach does not account for multiple exposures or synergistic and antagonistic interactions between COCs. This could lead to an over- or under-estimate of potential risks. For some organic constituents, including PAHs, PCBs, DDTr, and dioxins/furans, potential risks were calculated for chemical groups, rather than individual constituents. Evaluating risks as a group more effectively accounts for interactions among related chemicals.
- Chemicals exhibit complex behavior in the environment and the form in which they exist can significantly alter their toxicological properties, as well as their fate and transport characteristics and bioavailability. The characteristics of the medium in which they are present can also substantially affect bioavailability and the level to which potential receptors might be exposed. In general, bioavailability was not considered in this ERA. For example, WDNR (2003) guidance recommends SQG normalization to sediment TOC for nonpolar organics. It has been stablished that the organic carbon content of sediment is an important factor influencing the movement and bioavailability of nonpolar organic compounds (e.g., PAHs, PCBs) between the organic carbon content in bulk sediments and the sediment pore water (WDNR, 2003); however, WDNR no longer recommends this approach because it was frequently applied and interpreted incorrectly. It is notable that TOC in sediments of the General Mills Slip ranged (on average) from 3.3% (subsurface) to 5.0% (surface). To the extent that bioavailability is influenced by TOC concentrations greater than 1%, benthic invertebrate HQs may be overestimated.
- In evaluation of the fish community, BSAFs as reported in USEPA (1997b) were used in derivation of BCC concentrations in fish tissue. Although sediment screening values for birds were obtained directly from LANL (N3B, 2020), BSAFs were similarly used in derivation of the LANL screening values. There is uncertainty in the accuracy of BSAFs from these sources relative to application in the General Mills Slip. This could lead to an over- or underestimate of potential risks.

Toxicity Assessment Uncertainty

Generally, the available scientific information is insufficient to provide a thorough understanding of all the potential toxic properties of COCs. TRVs from the published literature were used to characterize risks. Uncertainties include:

- Differences in sensitivities to COCs between surrogate and receptor species.
- Differences between laboratory endpoints and receptor-specific endpoints.
- Differences between the duration of laboratory studies and the likely duration of exposure to receptors in the wild.
- The use of single-chemical test data that do not account for multiple exposure or synergistic and antagonistic interactions between COCs. The use of single-chemical test data that does not account for multiple exposure or synergistic and antagonistic interactions between COCs.
- The use, validity, and understanding of laboratory-based TRVs lie in their experimental definitions. Experimentally, these values are determined statistically. Derivation of TRVs by definition is biased by the experimental design. It is possible that a 20% or 30% reduction in reproduction or growth could occur but be statistically defined as a no-effect level. Conversely, it is possible for a 1% or 5% reduction to be statistically less than a control and result in an effect level. Statistical significance does not automatically relate to biological significance.

Risk Estimation Uncertainty

Risks in the ERA were characterized largely by calculating an HQ. HQs are not probabilistic measures of potential risk, and do not linearly represent hazard potentials. However, they can be used to estimate the potential level at which the measured or predicted exposure relates to known effects. The greater the departure from unity, the greater the indication that either a potential level of concern is present (HQ much greater than one) or there is little potential for concern (HQ much less than one). Uncertainty in the HQ is also compounded by the uncertainties associated with data, exposure and toxicity assessment uncertainties as discussed previously. The HQs contribute to a "line-of-evidence" for interpreting the potential for ecological impact. In the context of the ERA, HQs represent the first tier of an iterative ecological risk approach and can be used for assessing if a potential level of concern exists, whether additional evaluation is necessary or if remedial actions are warranted.

6.2.4.3 Risk Description

Viability and Function of the Benthic Macroinvertebrate Community

Benthic invertebrate PEC HQs exceed one for tributyltin, ranging from 4 (surface) to 7 (subsurface). PEC HQs were also exceeded in the surface interval for TEQ_{fish} (2), but results were limited to only three samples. PEC HQs also exceed one for BaP (2) in the subsurface and combined intervals. In addition, MEC HQs exceeded one for lead (2 – subsurface), and tPAHs (2 – subsurface and combined intervals). Benthic toxicity test results also suggest risks to the benthic community. Based upon results from both comparison with SQGs and results of toxicity tests, the data suggest potential risks are present with respect to viability and function of the benthic macroinvertebrate community.

Viability and Function of the Fish Community

Although LOAEL HQs exceeded one for mercury (3 – subsurface and combined intervals) and total DDTr (2 – subsurface), all LOAEL HQs were less than one. It is concluded that potential risks are low, and there is no unacceptable risk relative to the viability and function of the fish community.

Survival, Growth, and Reproduction of Invertivorous and Carnivorous Birds

Among the BCCs evaluated with respect to birds, LOAEL HQs above one were indicated for total DDTr in the subsurface (3), surface (2), and combined intervals (3). NOAEL HQs for total PCBs exceeded one in subsurface (3) and combined intervals (3). However, all LOAEL HQs were below one. Thus, PCBs are not considered a significant concern relative to this assessment endpoint. There is great uncertainty in the DDTr exposure concentrations due to the very limited number of samples (three in the surface and two in the subsurface). As a result, potential risks to the survival, growth and reproduction of invertivorous and carnivorous birds associated with DDTr cannot be disregarded.

7. Remedial Action Objectives and Preliminary Remedial Goals

The RAOs and PRGs consider the minimization or elimination of risks, or potential risks, from contaminants to human health and the environment and elimination of the contribution of contaminants to beneficial use impairments (BUIs) and contributions towards BUI removal for the SLRAOC. Risk management assessments for the protection of human health and the environment were performed to evaluate analytical and other investigative data collected at the General Mills Slip.

7.1 Relevant Contaminants

7.1.1 Human Health Risk Assessment

A HHRA was performed to evaluate potential human exposure associated with fish ingestion. The CSM indicated potential exposures to an angler fishing within the Slip and ingestion of fillets of captured fish. Although other pathways were considered in development of the CSM (incidental dermal or ingestion of sediments), they were considered as potentially complete but insignificant. COCs consisted of BCCs identified in sediments, specifically PCB Aroclors, DDTr, dioxins/furans, and mercury.

Cumulative carcinogenic risk was estimated as high as 9E-05 in combined sediments (i.e., all intervals). The greatest contributions to risk (i.e., risk drivers) were dioxins/furans, PCBs, and to a lesser extent DDTr. Interpretation of the contribution of dioxins/furans and DDTr was limited due to the low number of samples analyzed for these constituents. Given that uncertainties point to overestimates of potential risks, and that cumulative cancer risks are within USEPA's acceptable cancer risk range of 1E-06 to 1E-04, no numerical RAOs are specified relative to human health exposures. However, it is also important to acknowledge that RAOs proposed in the ERA for dioxins/furans and DDTr will also reduce potential human health risks associated with these constituents.

7.1.2 Ecological Risk Assessment

An ERA was performed to evaluate potential ecological exposures to sediments in the General Mills Slip. The CSM indicated potential direct exposures for benthic invertebrates, and bioaccumulation of BCCs into fish tissue and prey of birds. No unacceptable risks were identified relative to evaluation of the fish community when considering background contributions to mercury. However, DDTr concentrations in sediments suggest potential risks to invertivorous and carnivorous birds, where LOAEL HQs ranged from two to three in subsurface and surface sediment intervals, respectively.

Potential risks were identified with respect to the benthic invertebrate community, specifically, PEC HQs exceeded one for tributyltin and TEQ_{fish}, ranging from 2 to 7. MEC HQs also exceeded one for total PAHs, benzo(a)pyrene, and lead, ranging from 2 to 3. RAOs and PRGs will be established for tributyltin, $TEQ_{fish,}$ tPAHs, and lead. No RAOs or PRGs are proposed for benzo(a)pyrene, as the compound is associated with total PAHs.

7.2 Remedial Action Objectives

Under the Great Lakes Water Quality Agreement (GLWQA), a St. Louis River Stage 1 Remedial Action Plan (RAP) was completed in 1992 through the collaborative efforts of the WDNR, the Minnesota Pollution Control Agency, and local stakeholders. Updates to the RAP have been made periodically, with the most recent update in 2022. The RAP identifies specific management actions that need to be completed to remove BUIs and eventually delist the SLRAOC.

The RAP initially identified nine beneficial uses that were impaired in the SLRAOC. Management actions have been completed for four of the original nine listed impairments, and these BUIs have been formally removed for this AOC. The following table contains the BUIs for the SLRAOC, with five of the nine BUIs linked to contaminated sediment.

SLR BUI No.	Beneficial Use Impairment	Status	Linked to Contaminated Sediment
1	Fish consumption advisories	Impaired	Yes
2	Degraded fish and wildlife populations (Removed in 2023 – no longer impaired)	Removed	No
3	Fish tumors and other deformities (Removed in 2018 – no longer impaired)	Removed	No
4	Degradation of benthos	Impaired	Yes
5	Restrictions on dredging	Impaired	Yes
6	Excessive loading of sediment and nutrients (Removed in 2020 – no longer impaired)	Removed	No
7	Beach closings and body contact restrictions	Impaired	Yes
8	Degradation of aesthetics (Removed in 2014 – no longer impaired)	Removed	No

SLR BUI No.	Beneficial Use Impairment	Status	Linked to Contaminated Sediment
9	Loss of fish and wildlife habitat	Impaired	Yes

As sediment is the focus of this investigation, BUI Numbers 1,2,4,5,7 and 9 are applicable. Each relevant BUI is discussed below:

- **BUI No. 1** – Fish Consumption Advisories. Based on the results of the HHRA, Cumulative carcinogenic risk was estimated as high as 9E-05 in combined sediments (i.e., all intervals). HQs ranged from 2 in the subsurface to 4 in the combined intervals. Given that uncertainties point to overestimates of potential hazards and risks, cumulative cancer risks are within USEPA's acceptable cancer risk range of 1E-06 to 1E-04, mercury is consistent with background and numerical RAOs proposed in the ERA for dioxins/furans will also reduce potential human health risks and hazards, no numerical RAOs are specified relative to human health exposures.

- **BUI No. 4 – Degradation of Benthos**. Potential unacceptable risks were identified with respect to the benthic invertebrate community. Using the MEC as a benchmark, potential contributions to risk include tributyltin, TEQ_{fish}, tPAHs, and lead. The RAO for this BUI is to reduce sediment concentrations of these constituents to minimize or eliminate risks to the benthic invertebrate community.

- **BUI No. 5 – Restrictions on Dredging.** Dredging restrictions will be addressed as part of the discussion of remedial alternatives. Contaminant concentrations in the slip warrant additional costs for water quality controls during dredging, material handling, and disposal. The remedial action plan for the SLRAOC identifies the remediation of contaminated sediments in the General Mills Slip as management action 5.03 for removal of the restrictions on dredging BUI. For example, exceedances of industrial DC NTE RCLs (e.g., BaP, OCDD, and 1,2,3,4,6,7,8-HPCDD) will limit opportunities for ex situ sediment management other than higher cost disposal options including commercial landfill or other regulated CDF. Lower cost disposal options including land application, beneficial reuse and management in an unlined, upland site will not be available due to these COC exceedances.

- **BUI No. 7 – Beach Closings and Body Contact Recreation.** There are no beaches associated with the General Mills Slip. Body contact to slip sediment due to recreational activities was identified as a potentially complete but insignificant exposure pathway in the CSM. No remedial action objectives are currently proposed to address beach closings and body contact recreation specific to the General Mills Slip.

- **BUI No. 9 – Loss of Fish and Wildlife Habitat**. A key component of this BUI is completion of remediation of contaminated sediment. Per MPCA and WDNR (2022), the BUI removal target will be reached when:

  State resource management agencies concur, in consultation with their federal, tribal, local, and nonprofit partners, that a reasonable amount, as quantified in the benchmarks, of fish and wildlife habitat, given the presence of industrial development in the estuary, that is currently degraded is enhanced, rehabilitated, and protected against further loss of habitat. (MPCA and WDNR, 2022).

  This BUI target is not specifically addressed as part of this investigation of the General Mills Slip; however, it is anticipated that any sediment remediation to reduce risks to the benthic invertebrate community will contribute to meeting the objectives of BUI No. 9.

The key focus for RAOs based on results from the Risk Assessments of the General Mills Slip relate to BUI No. 4 – Degradation of Benthos. TPAHs, TEQ_{fish}, tPAHs, and lead each had HQs exceeding one for the MEC and/or PEC. A range of PRGs is presented to provide a basis for evaluation of alternatives for remedial decision making, as follows:

Constituent	PRG = 1x MEC (µg/kg)	PRG = 1x PEC (µg/kg)	PRG = 2x PEC (µg/kg)
tPAHs	12,205	22,800	45,600
TEQ_{fish}	11.2	21.5	43
Tributyltin	1.73	2.94	5.88
Lead	83,000	130,000	260,000

Note: 2x the MEC is not included as it is greater than the PEC

Note that these PRGs are based on the 95% UCL (EPC) to be consistent with the approach used in the risk assessment. From a risk perspective, a value greater than 1x MEC could be justified based on uncertainties discussed in the Uncertainty Analysis.

8. Recontamination Potential

The main contributor of sediment contamination at the General Mills Slip was from past petroleum leaks, documented soil and groundwater contamination in adjacent sites, the use of tributyl tin on ship hulls and industrial activities including products historically transferred at the dock. With remedial actions, such as sediment removal and capping and the ban on use of tributyl tin; the migration of these COCs associated with the historical use will decrease. However, the area encompassing the Slip continues to be industrial in nature, with one opened and various closed BRRTS cases. According to the WDNR's Remediation and Redevelopment Database, there is one open incidence as of May 5, 2001, approximately 0.15 miles from the General Mills Slip with contaminated groundwater plumes of petroleum, TCE and metals (i.e., arsenic, lead, chromium).

The potential for recontamination of the Slip exists with the continued use of grain elevators and ships used for grain transport. Given the site's proximity to the bay, sediments in the SLRAOC AOC could potentially be re-contaminated via surface run-off, wind dispersal, subsurface contaminant migration, or filling activities (SIGMA, 2019b).

Other potential contaminant transport pathways to sediments include:

- From a tanker to surface water;
- A spill off the dock;
- Undocumented petroleum pipeline leaks that ran from the historical petroleum product storage terminal to the west of the General Mills Slip;
- A leak in an underground storage tank and a subsurface pathway to the sediment; and
- Groundwater to surface water contaminant transport.

The potential for recontamination of unimpacted materials, particularly after remedial actions, exists with these nearby sources.

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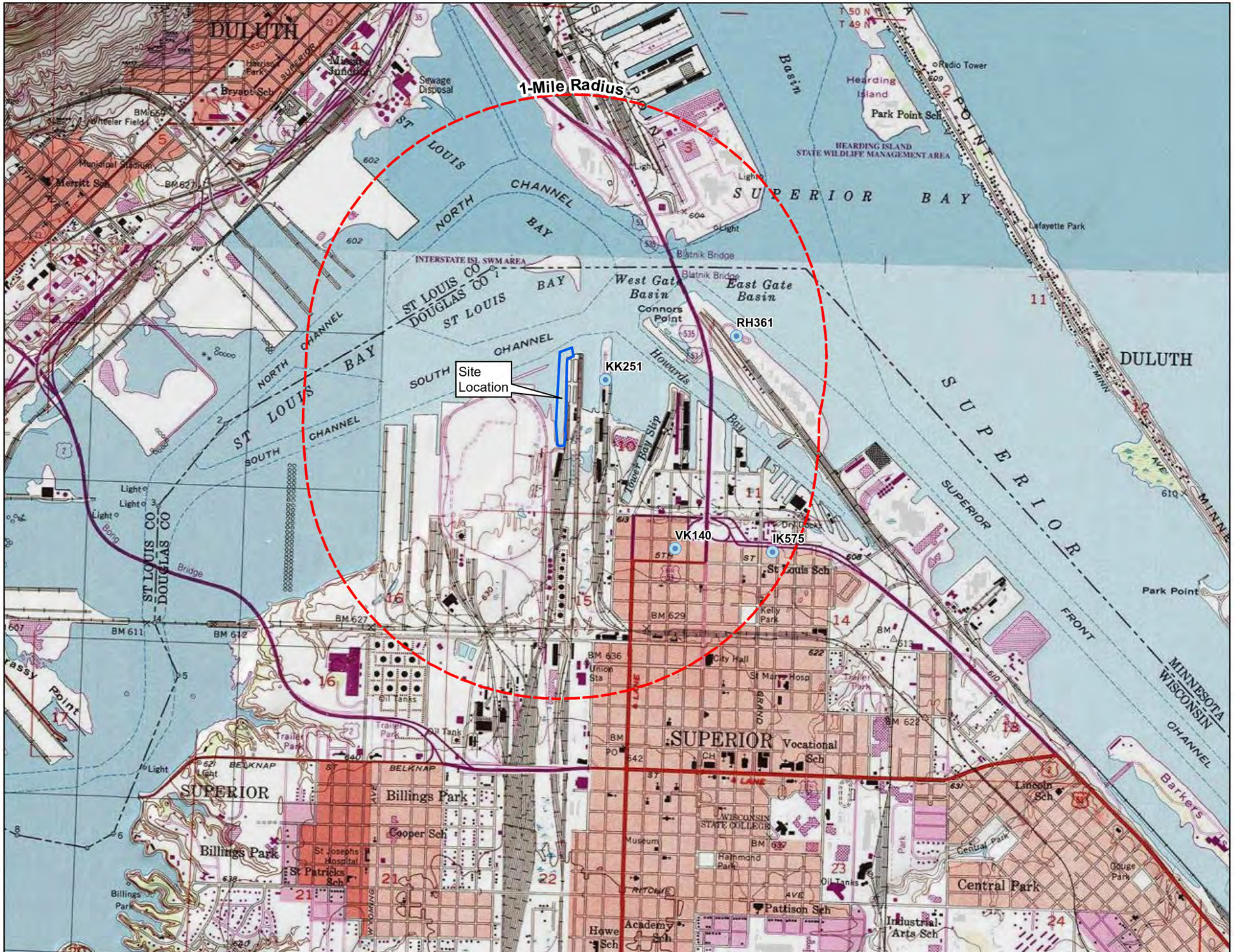
Figures



VICINITY MAP

Legend

- Water Supply Well
- General Mills Slip
- 1-Mile Radius

Source:
USGS 7-5 Minute Topographica Maps
Superior, Duluth, West Duluth and
Duluth Heights Quadrangles

Wisconsin Department of Natural Resources -
Bureau of Drinking Water and Groundater

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

N

0 1,000 2,000 4,000
Feet

AECOM

Title: **Site Location Map**
General Mills Slip

Project: General Mills
Remedial Investigation Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: Site Map Gen Mills.mxd

Project No.:	Date:	Figure:
60685299	9/16/2022	1-1

Path: L:\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\Site Map Gen Mills.mxd

VICINITY MAP

Legend

- Railroad
- General Mills Slip
- Parcel Owners

Image Source: Douglas County
Image Date: 2022

Parcel data from the City of Superior/Douglas County

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

N

0 150 300 600
Feet

AECOM

Title:	**Surrounding Parcel Owners General Mills Slip**
Project:	General Mills Remedial Investigation Report Superior, Wisconsin
Client:	Wisconsin DNR
File Name:	Site Layout Gen Mills.mxd

Project No.:	Date:	Figure:
60685299	5/11/2023	2-1

Path: L:\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\RI\20230511\Site Layout Gen Mills.mxd

Letter	Historical Features
C	Great Lakes Dock Coal dock, 1889-1973
D	Carnegie Dock Coal dock, 1889-mid-1950s
E	Lehigh Dock Coal dock, 1886-eary 1950s
F	Great Northern Dock Merchandise dock, 1889-eary 1960s
G	General Mills Dock Coal dock, 1888-1898, Grain elevatotors, 1886-present, Oil terminal, 1939-1961
H	21 MG molasses ASTs, 1946-1955
I	Midwest Energy Resources Dock coal dock, 1976-present

VICINITY MAP

Legend

Historical Features

General Mills Slip

Image Source: UGSG Earth Explorer
Image Date: May 2, 1952

Storm and Sanitary Sewer Data
The City of Superior

Utility data from Superior Water, Light & Power

Parcel data from the City of Superior/Douglas County

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

N

0 250 500 1,000
Feet

AECOM

Title: **Former Site Layout and Historical Features**

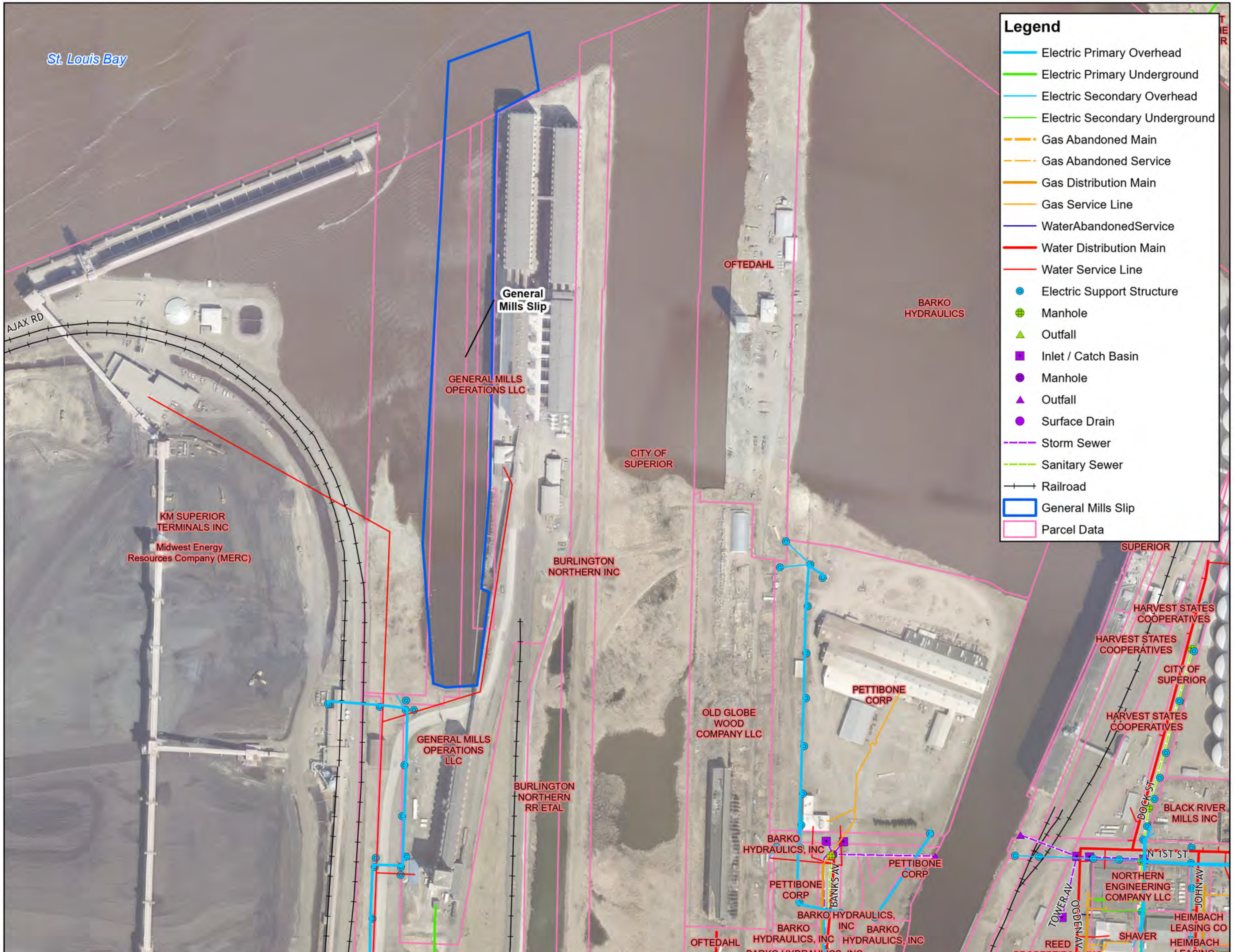
Project: General Mills Slip Remedial Investigation Report Superior, Wisconsin

Client: Wisconsin DNR

File Name: Former Site Layout Gen Mills.mxd

Project No.:	Date:	Figure:
60685299	9/16/2022	2-2

Path: L:\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\Former Site Layout Gen Mills.mxd



VICINITY MAP

Image Source: Douglas County
Image Date: 2022

Storm and Sanitary Sewer Data
The City of Superior

Utility data from Superior Water, Light & Power

Parcel data from the City of Superior/Douglas County

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

N

0 150 300 600
Feet

AECOM

Title: **Current Site Layout General Mills Slip**

Project: General Mills
Remedial Investigation Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: Current Site Layout Gen Mills.mxd

Project No.:	Date:	Figure:
60685299	5/11/2023	2-3

Path: L:\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\RI\20230511\Current Site Layout Gen Mills.mxd

VICINITY MAP

Legend

Back-up Generator Site Investigation Report (ET, 1999a)

- Geoprobe Location
- Monitoring Well Location

UST Fueling Site Investigation Report (ET, 1999b)

- Geoprobe Location
- Monitoring Well
- General Mills Slip

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

N

0 50 100 200
Feet

AECOM

Title:
Groundwater and Soil Sample Locations
Adjacent Upland Investigations

Project:
General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client:
Wisconsin DNR

File Name: GW Soil Sample Location Map Gen Mills Slip.mxd

Project No.:	Date:	Figure:
60685299	9/16/2022	2-4

Path: L:\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\GW Soil Sample Location Map Gen Mills Slip.mxd

VICINITY MAP

Legend

- 2020 Site Investigation Sediment Sample Locations (EA, 2021)
- 2015 Site Investigation Sediment Sample Locations (EA, 2016)
- General Mills Slip

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

0 125 250 500
Feet

AECOM

Title: **Sediment Sample Locations Previous Investigations**

Project: General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: 2-5 Sample Location Map Gen Mills Slip.mxd

Project No.:	Date:	Figure:
60685299	5/31/2023	2-5

Path: Z:\Houston-USHOU2\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\2-5 Sample Location Map Gen Mills Slip.mxd

VICINITY MAP

Legend

- Geotechnical Sample
- Treatability Study Sample
- General Mills Slip

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

N

0 125 250 500
Feet

AECOM

Title: **Sediment Sample Locations 2022 Investigation**

Project: General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: Sample Location 2022 Map Gen Mills Slip.mxd

Project No.:	Date:	Figure:
60685299	9/16/2022	3-1

Path: L:\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\Sample Location 2022 Map Gen Mills Slip.mxd

VICINITY MAP

Legend

SVOC Detected Values Only

- > 5xPEC
- > 2xPEC
- > PEC
- > TEC
- No Exceedance
- 2016 Sediment Sample Locations (Not Analyzed)
- General Mills Slip

See Table 4-1.2 for details of screening criteria and results. Sample depths shown were continuously sampled at each foot interval and analyzed for site COCs.

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

0 125 250 500
Feet

AECOM

Title: **Summary of SVOCs Exceeding SQG for Surface and Subsuface**

Project: General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: 4-1 - SVOC Exceed SQG Map GM Slip.mxd

Project No.:	Date:	Figure:
60685299	6/1/2023	4-1

Path: Z:\Houston-USHOU2\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\RI\20230530\4-1 - SVOC Exceed SQG Map GM Slip.mxd

VICINITY MAP

Legend

2020 Sediment Sample Locations

-) > 5x PEC
-) > 2x PEC
-) > PEC
-) > TEC

2015 Sediment Sample Locations

- (> 5x PEC
- (> 2x PEC
- (> PEC
- General Mills Slip

See Table 4-1.1 and 4-1.2 for details of screening criteria and results. Sample depths shown were continuously sampled at each foot interval and analyzed for site COCs.

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

0 125 250 500
Feet

AECOM

Title: **Summary of Individual PAHs Exceeding SQG for Surface and Subsuface**

Project: General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: 4-2 - PAHs Exceed SQG Map GM Slip.mxd

Project No.:	Date:	Figure:
60685299	5/30/2023	4-2

Path: Z:\Houston-USHOU2\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\RI\4-2 - PAHs Exceed SQG Map GM Slip.mxd

Parameter	TEC	MEC	PEC	2xPEC	5xPEC	Units
Total PAH-18 (NDs=0)	1610	12205	22800	45600	114000	µg/kg

VICINITY MAP

Legend

2020 Sediment Sample Locations

- > 5x PEC
- > 2x PEC
- > PEC
- > MEC
- > TEC
- No Exceedance

2015 Sediment Sample Locations

- > 2x PEC
- > PEC
- > TEC

General Mills Slip

See Table 4-1.1 and 4-1.2 for details of screening criteria and results. Sample depths shown were continuously sampled at each foot interval and analyzed for site COCs.

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

0 125 250 500
Feet

AECOM

Title: **Summary of Total PAHs Exceeding SQG for Surface and Subsuface**

Project: General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: 4-3 - Total PAHs Exceed SQG Map GM Slip.mxd

Project No.: 60685299 | Date: 5/30/2023 | Figure: 4-3

Path: Z:\Houston-USHOU2\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\RI\4-3 - Total PAHs Exceed SQG Map GM Slip.mxd

Path: Z:\Houston-USHOU2\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\RI\20230511\4-4-Summary of Analytes Exceeding Industrial DC NTE RCL for Surface and Subsurface.mxd

VICINITY MAP

Legend

2020 Sediment Sample Locations

- > Industrial Soil DC NTE RCL
- < Industrial Soil DC NTE RCL

2015 Sediment Sample Locations

- > Industrial Soil DC NTE RCL
- < Industrial Soil DC NTE RCL

General Mills Slip

See Table 4-2.1 and 4-2.2 for details of screening criteria and results.
Sample depths shown were continuously sampled at each foot interval and analyzed for site COCs.

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

0 125 250 500
Feet

AECOM

Title: **Summary of Analytes Exceeding Industrial DC NTE RCL for Surface and Subsurface**

Project: General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: 4-4-Summary of Analytes Exceeding Industrial DC NTE RCL for Surface and Subsurface.mxd

Project No.:	Date:	Figure:
60685299	5/30/2023	4-4

Path: Z:\Houston-USHOU2\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\RI\4-5 - Metals Exceed SQG Map GM Slip.mxd

VICINITY MAP

Legend

2020 Sediment Sample Locations

- > 2x PEC
- > PEC
- > MEC
- > TEC

2015 Sediment Sample Locations

- > MEC
- > TEC

General Mills Slip

See Table 4-1.1 and 4-1.2 for details of screening criteria and results. Sample depths shown were continuously sampled at each foot interval and analyzed for site COCs.

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

0 125 250 500
Feet

AECOM

Title: **Summary of Metals Exceeding SQG for Surface and Subsuface**

Project: General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: 4-5 - Metals Exceed SQG Map GM Slip.mxd

Project No.:	Date:	Figure:
60685299	5/30/2023	4-5

VICINITY MAP

Legend

2020 Sediment Sample Locations

- > MEC
- No Exceedance
- Not Analyzed for PCBs

2015 Sediment Sample Locations

- >TEC
- No Exceedance

General Mills Slip

See Table 4-1.1 and 4-1.2 for details of screening criteria and results.
Sample depths shown were continuously sampled at each foot interval and analyzed for site COCs.

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

0 125 250 500
Feet

AECOM

Title: **Summary of Total PCBs Exceeding SQG for Surface and Subsuface**

Project: General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: 4-6 - Total PCBs Exceed SQG Map GM Slip.mxd

Project No.:	Date:	Figure:
60685299	5/31/2023	4-6

Path: Z:\Houston-USHOU2\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\RI\20230530\4-6 - Total PCBs Exceed SQG Map GM Slip.mxd

VICINITY MAP

Legend

2020 Sediment Sample Locations

- > 5xPEC
- > PEC
- > MEC
- Non-Detect Value Exceeding PEC
- Non-Detect Value Exceeding MEC
- Non-Detect Value Exceeding TEC

2015 Sediment Sample Locations

- > 5x PEC
- Not Analyzed for Organotins

General Mills Slip

See Table 4-1.1 and 4-1.2 for details of screening criteria and results.
Sample depths shown were continuously sampled at each foot interval and analyzed for site COCs.

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

0 125 250 500
Feet

AECOM

Title:
Summary of Organotins Exceeding SQG for Surface and Subsuface

Project:
General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client:
Wisconsin DNR

File Name: 4-7 - Organotins Exceed SQG Map GM Slip.mxd

Project No.:	Date:	Figure:
60685299	5/31/2023	4-7

Path: Z:\Houston-USHOU2\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\RI\20230530\4-7 - Organotins Exceed SQG Map GM Slip.mxd

Path: Z:\Houston-USHOU2\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\RI\20230530\4-8 - Total PAHs Isoconcentration Map GM Slip.mxd

Parameter	TEC	MEC	PEC	2xPEC	5xPEC	Units
Total PAH-18 (NDs=0)	1610	12205	22800	45600	114000	µg/kg

VICINITY MAP

Legend

- 2020 Sediment Sample Locations
- 2015 Sediment Sample Locations

Total PAH Exceedance

- > 5x PEC
- > 2x PEC
- > PEC
- > MEC
- > TEC
- General Mills Slip

Highest TPAH calculated value for each location is shown. Please refer to Tables 4-1.1 and 4-1.2 for details.

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

0 125 250 500
Feet

AECOM

Title:
Isoconcentration Map of Total PAH

Project:
General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client:
Wisconsin DNR

File Name: 4-8 - Total PAHs Isoconcentration Map GM Slip.mxd

Project No.:	Date:	Figure:
60685299	11/11/2022	4-8

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

AECOM

Title:
Map of Sediment Cross-Sections General Mills Slip

Project:
General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client:
Wisconsin DNR

File Name: XSect Location Map Gen Mills Slip.mxd

Project No.:	Date:	Figure:
60685299	9/16/2022	4-9

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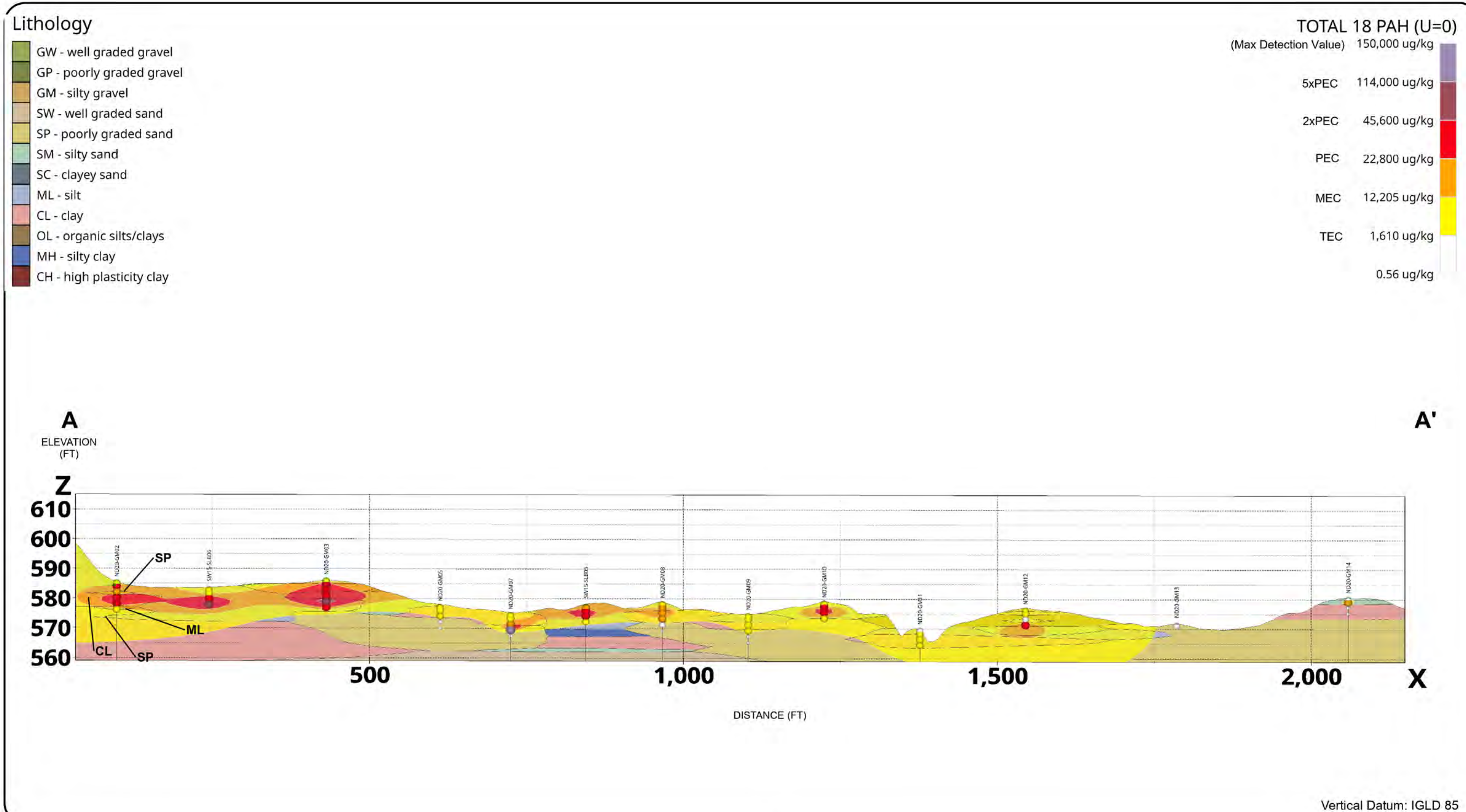


TITLE

GEOLOGIC CROSS SECTION - SOUTH TO NORTH (TOTAL PAH)

AECOM

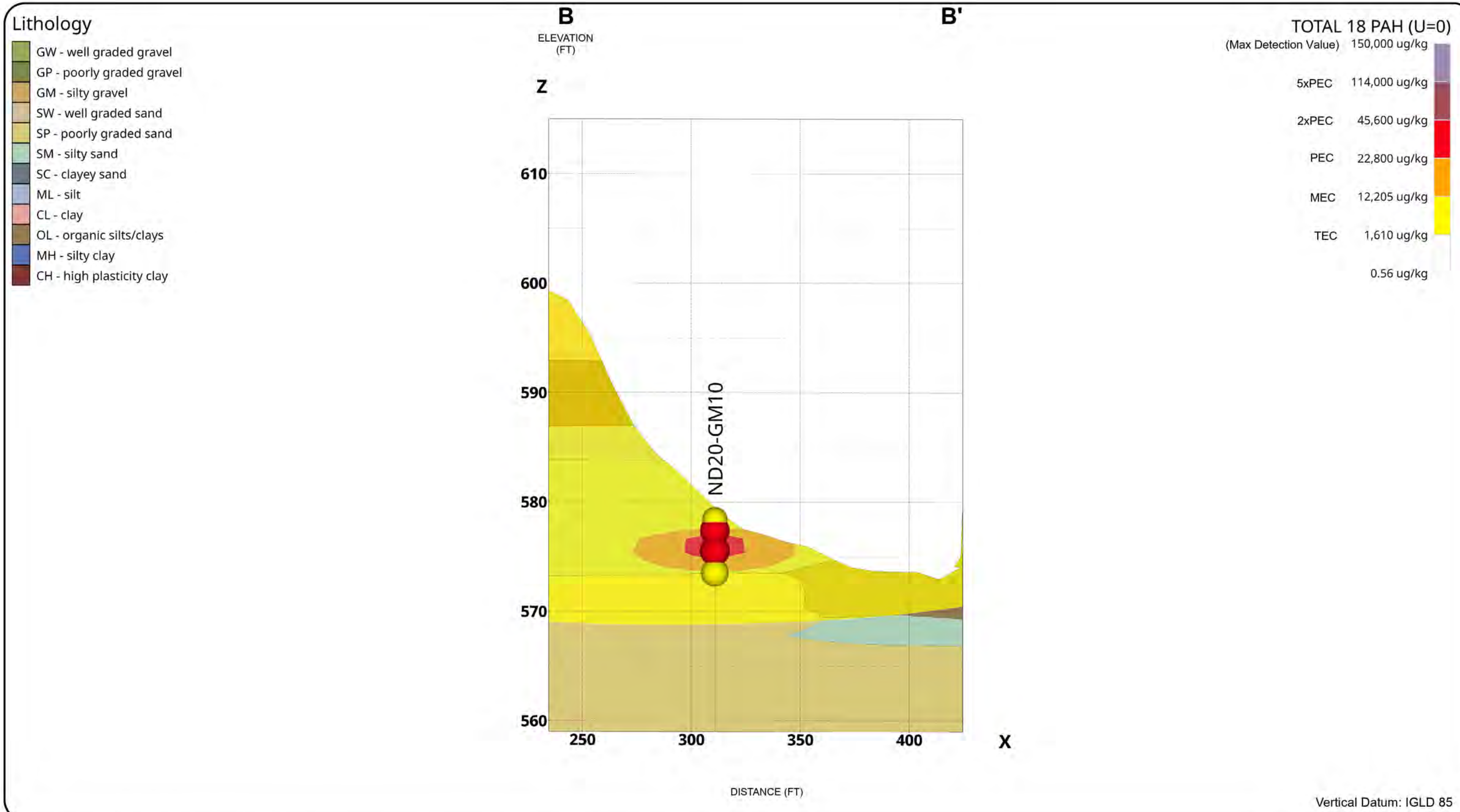
AECOM TECHNICAL SERVICES, INC.
SOUTHFIELD, MI., 248-204-5900

NOTE: FOR INFORMATIONAL PURPOSES ONLY

NOT A PROFESSIONAL SURVEY
ALL LOCATIONS/DIMENSIONS ARE APPROXIMATE

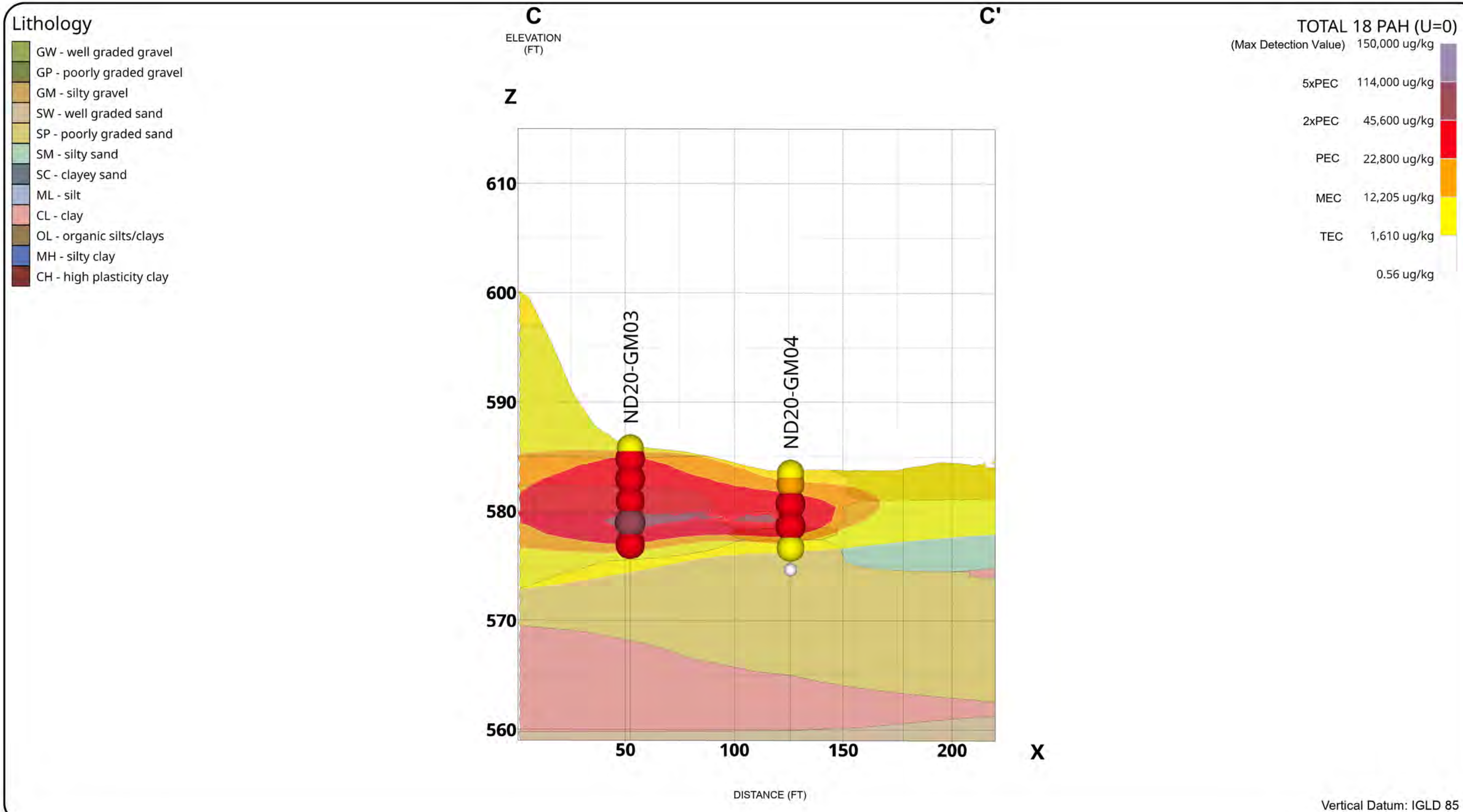
DATE	JOB NO
05/02/23	60685299
DR DW	SKETCH NO. FIG. 4-10.1
CK AB	

Y:\Projects\WDNR\SaintLouisBaySlips\MXDs\General Mills Cross Section Fig 4-10_1.mxd



TITLE		DATE	JOB NO
GEOLOGIC CROSS SECTION - WEST TO EAST (TOTAL PAH)	NOTE: FOR INFORMATIONAL PURPOSES ONLY	05/02/23	60685299
AECOM — AECOM TECHNICAL SERVICES, INC. SOUTHFIELD, MI., 248-204-5900	NOT A PROFESSIONAL SURVEY ALL LOCATIONS/DIMENSIONS ARE APPROXIMATE	DR DW CK AB	SKETCH NO. FIG. 4-10.2

Y:\Projects\WDNR\SaintLouisBaySlips\MXDs\General Mills Cross Section Fig 4-10_2.mxd



TITLE

GEOLOGIC CROSS SECTION - WEST TO EAST (TOTAL PAH)

AECOM

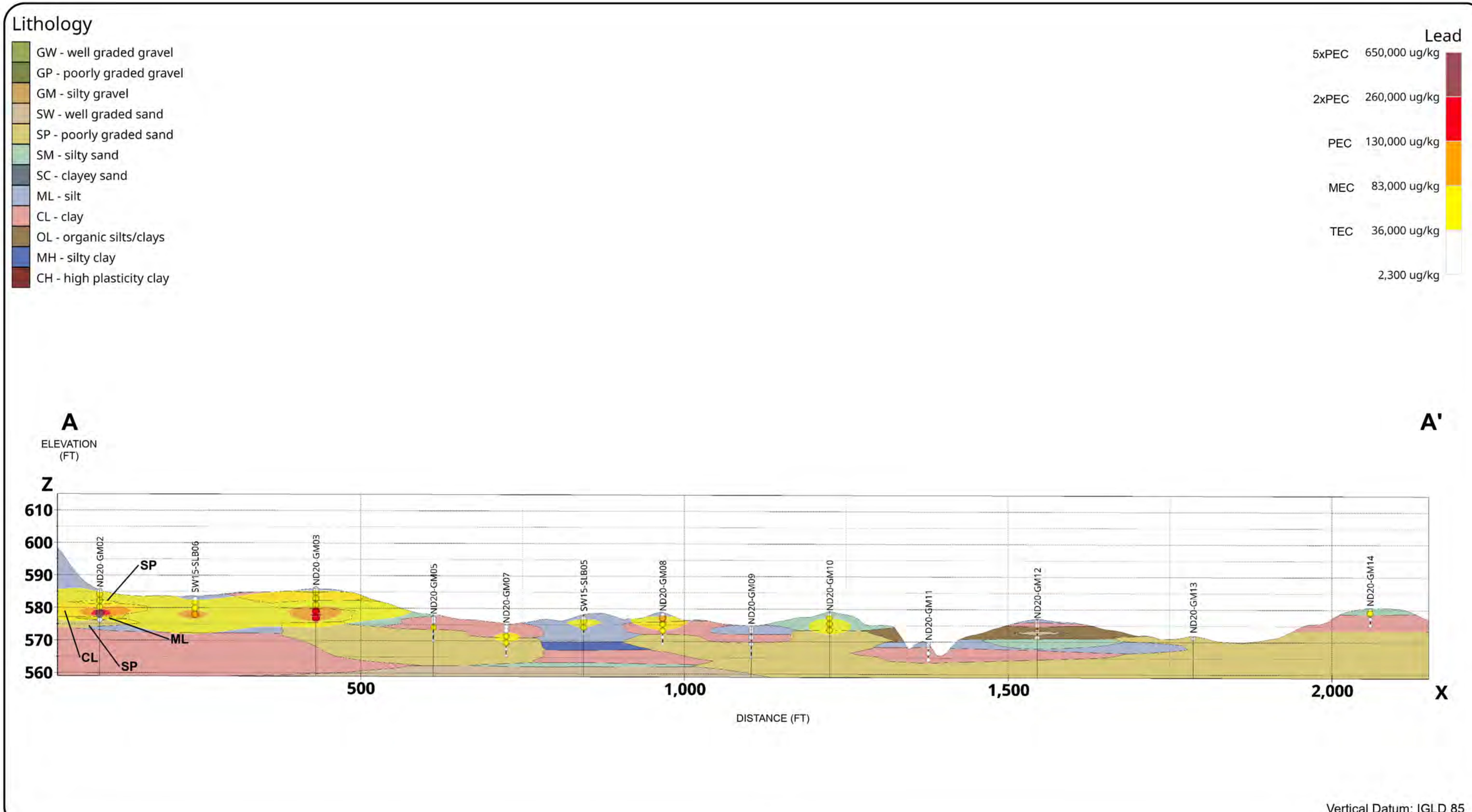
AECOM TECHNICAL SERVICES, INC.
SOUTHFIELD, MI., 248-204-5900

NOTE: FOR INFORMATIONAL PURPOSES ONLY

NOT A PROFESSIONAL SURVEY
ALL LOCATIONS/DIMENSIONS ARE APPROXIMATE

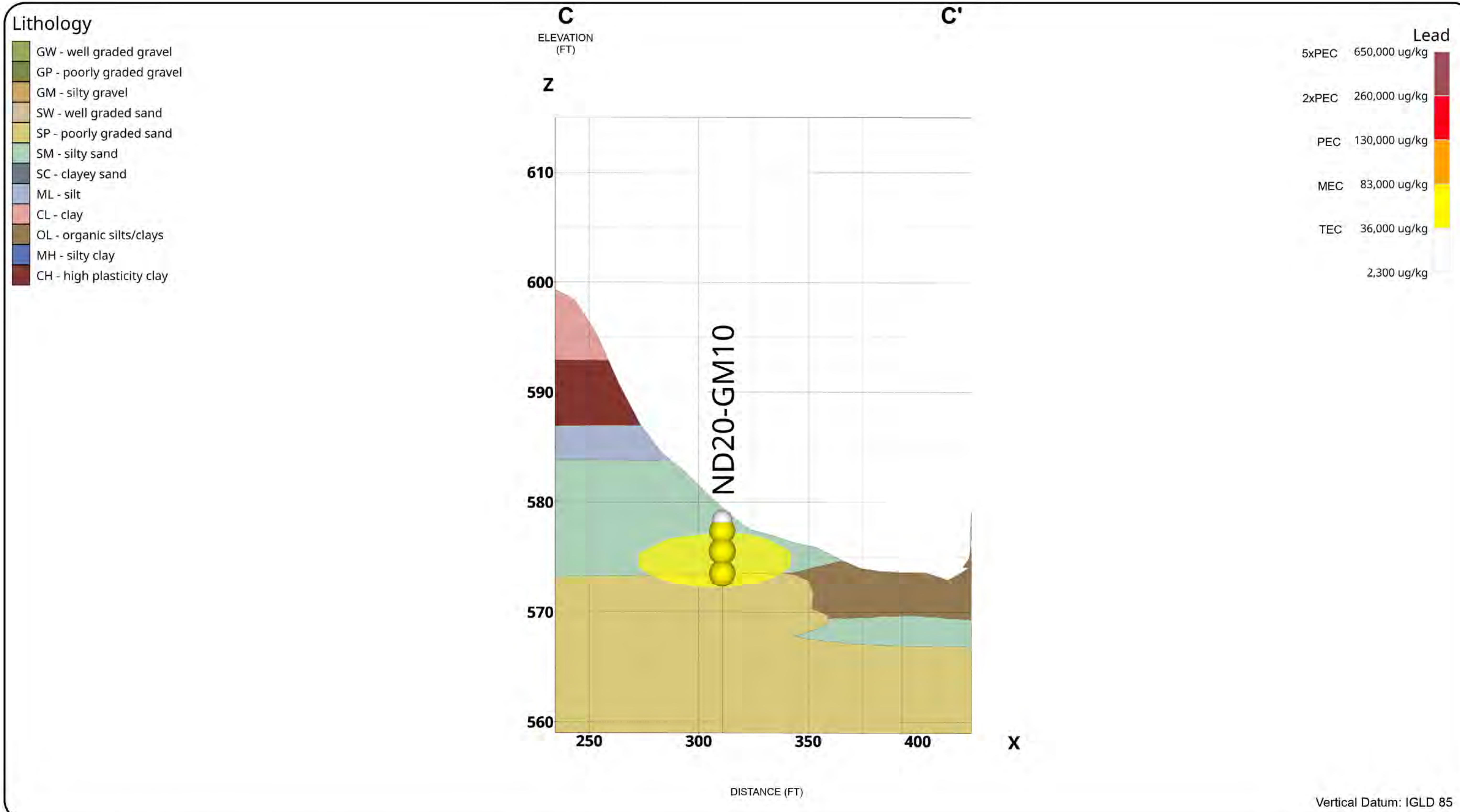
DATE	JOB NO
05/02/23	60685299
DR DW	SKETCH NO.
CK AB	FIG. 4-10.3

Y:\Projects\WDNR\SaintLouisBaySlips\MXDs\General Mills Cross Section Fig 4-10_3.mxd



TITLE		DATE	JOB NO
GEOLOGIC CROSS SECTION - SOUTH TO NORTH (LEAD)	NOTE: FOR INFORMATIONAL PURPOSES ONLY	05/02/23	60685299
AECOM — AECOM TECHNICAL SERVICES, INC. SOUTHFIELD, MI., 248-204-5900	NOT A PROFESSIONAL SURVEY ALL LOCATIONS/DIMENSIONS ARE APPROXIMATE	DR DW CK AB	SKETCH NO. FIG. 4-11.1

Y:\Projects\WDNR\SaintLouisBaySlips\MXDs\General Mills Cross Section Fig 4-11_1.mxd



TITLE

GEOLOGIC CROSS SECTION - WEST TO EAST (LEAD)

AECOM

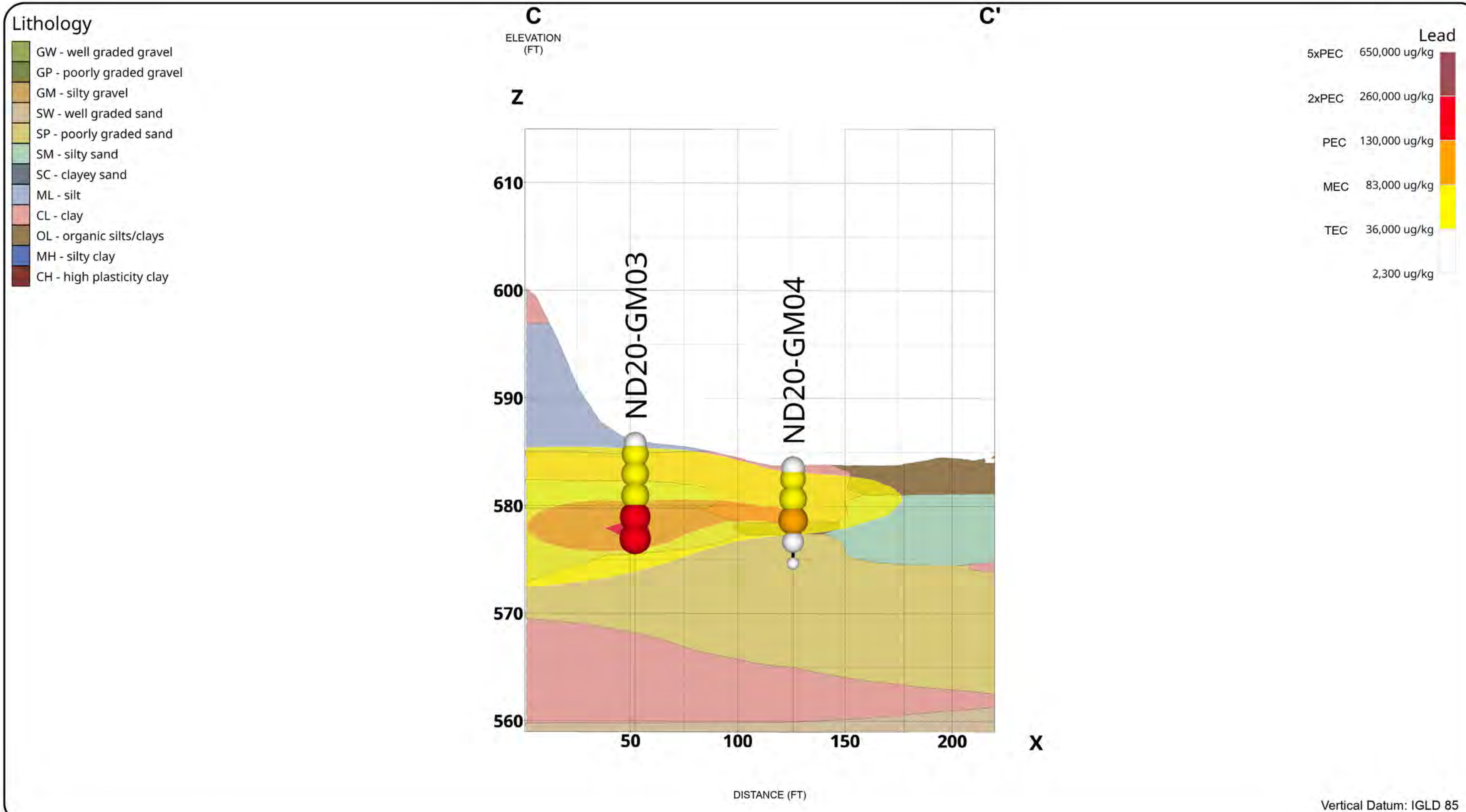
AECOM TECHNICAL SERVICES, INC.
SOUTHFIELD, MI., 248-204-5900

NOTE: FOR INFORMATIONAL PURPOSES ONLY

NOT A PROFESSIONAL SURVEY
ALL LOCATIONS/DIMENSIONS ARE APPROXIMATE

DATE 05/02/23	JOB NO 60685299
DR DW	SKETCH NO. FIG. 4-11.2
CK AB	

Y:\Projects\WDNR\SaintLouisBaySlips\MXDs\General Mills Cross Section Fig 4-11_2.mxd



TITLE

GEOLOGIC CROSS SECTION - WEST TO EAST (LEAD)

AECOM

AECOM TECHNICAL SERVICES, INC.
SOUTHFIELD, MI., 248-204-5900

NOTE: FOR INFORMATIONAL PURPOSES ONLY

NOT A PROFESSIONAL SURVEY
ALL LOCATIONS/DIMENSIONS ARE APPROXIMATE

DATE 05/02/23	JOB NO 60685299
DR DW	SKETCH NO. FIG. 4-11.3
CK AB	

Y:\Projects\WDNR\SaintLouisBaySlips\MXDs\General Mills Cross Section Fig 4-11_3.mxd

Parameter	Analytic Method	TEC	MEC	PEC	2x PEC	5x PEC	Units
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	µg/kg

VICINITY MAP

Legend

- Sediment Sample Location (EA, 2020)
- Sediment Sample Locations (EA 2016)

Tri-n-butyltin Hydride Exceedance

- > 5x PEC
- > 2x PEC
- > PEC
- > MEC
- > TEC
- General Mills Slip

NA - Not Analyzed for Tri-n-butyltin hydride
< - Laboratory Non-Detect

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

N

0 125 250 500
Feet

AECOM

Title: **Isoconcentration Map of Tri-n-butyltin Hydride**

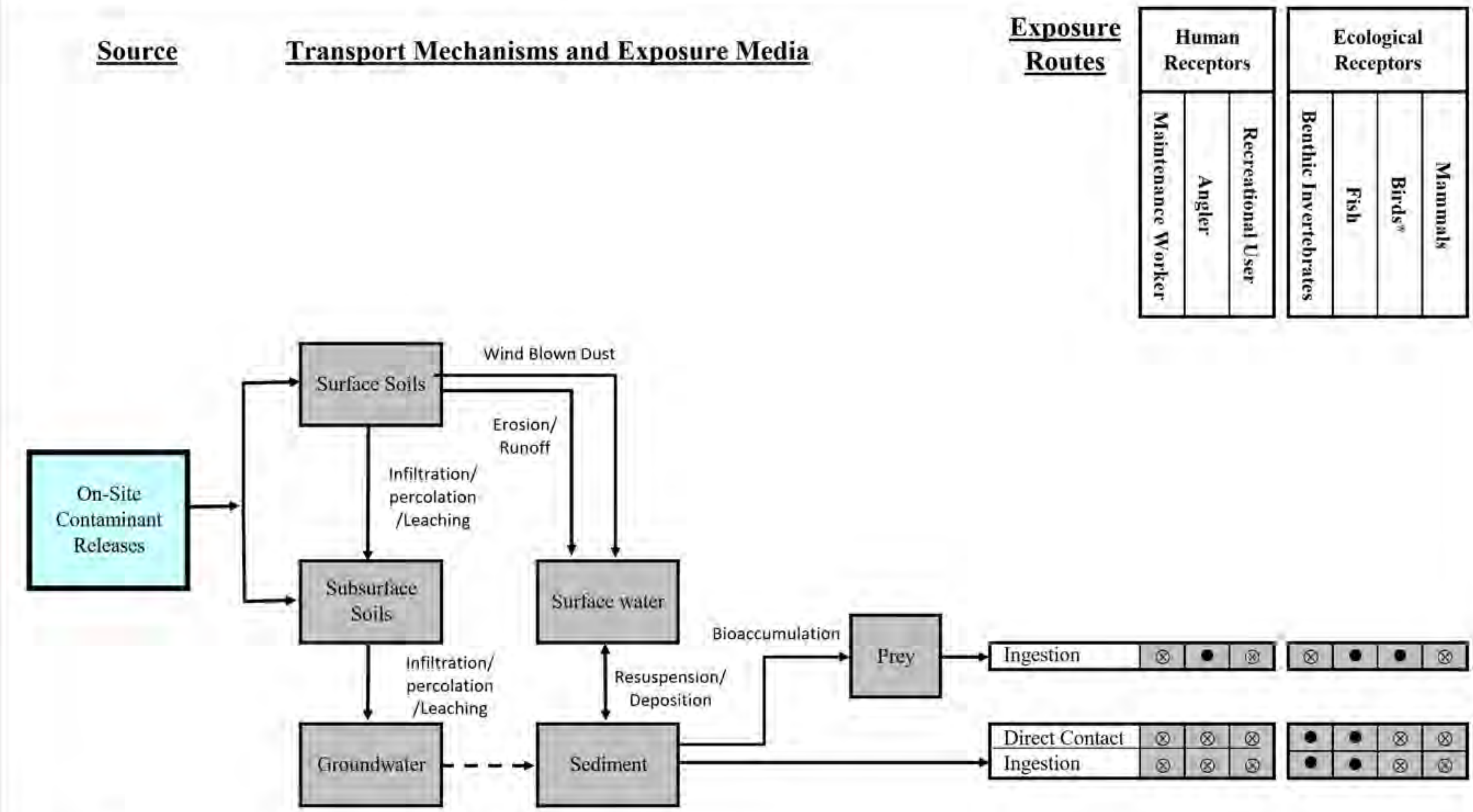
Project: General Mills Slip
Remedial Investigation Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: 4-12 - Tributyltin Isoconcentration Map GM Slip.mxd

Project No.:	Date:	Figure:
60685299	6/1/2023	4-12

Path: L:\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\RI\20230530\4-12 - Tributyltin Isoconcentration Map GM Slip.mxd



NOTEs:

——— Potentially complete pathway

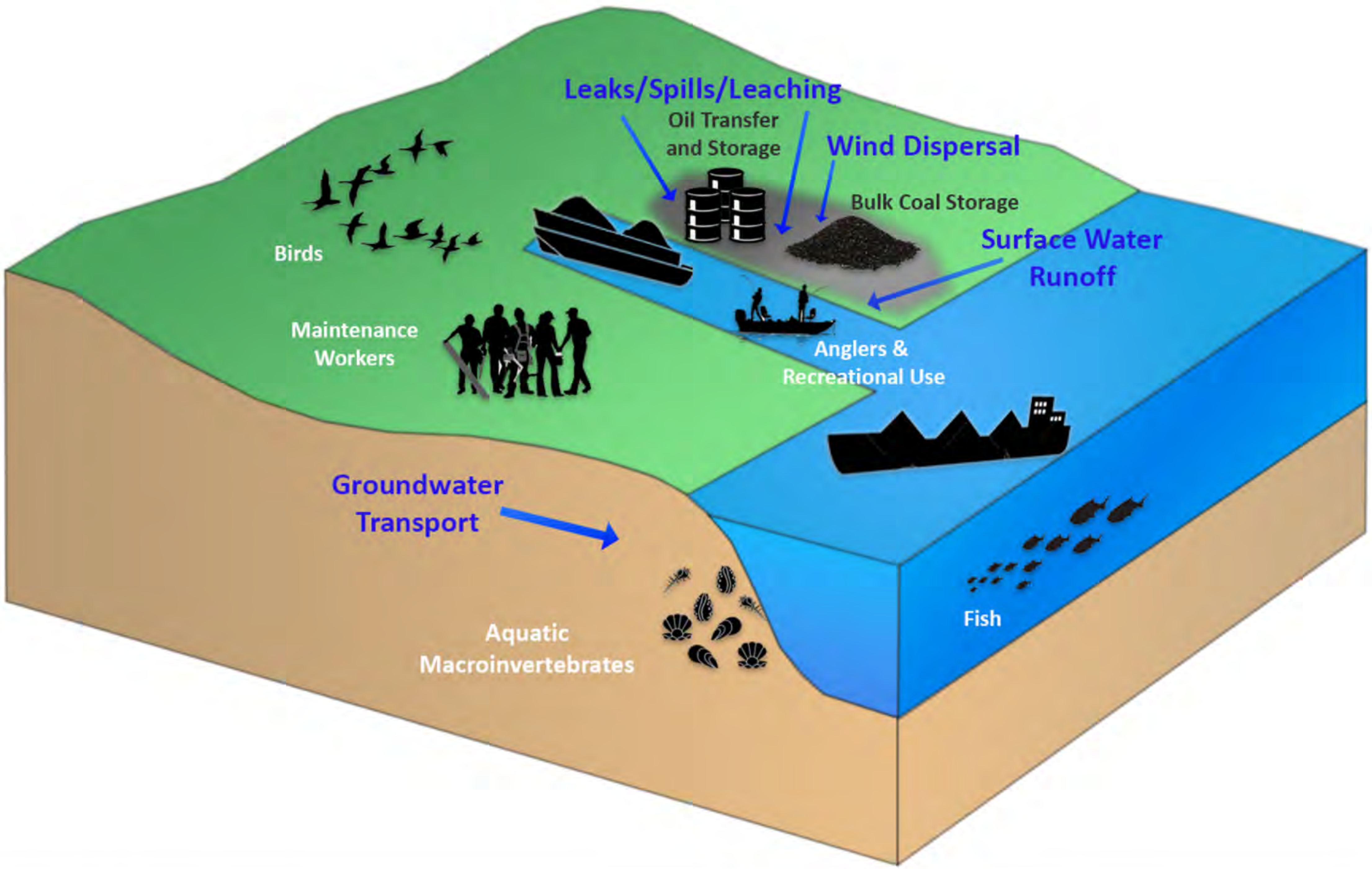
– – – – Incomplete, or potentially complete but insignificant pathway

* - invertivores, carnivores

● = Potentially complete exposure pathway

⊗ = Potentially complete but insignificant or not assessed

FIGURE 5-1: Conceptual Site Model
General Mills Slip Sediments
Superior, Wisconsin



TITLE Conceptual Site Model - General Mills	NOTE: FOR INFORMATIONAL PURPOSES ONLY	DATE 11/09/22 · JOB NO 60685299
AECOM · AECOM TECHNICAL SERVICES, INC. SOUTHFIELD, MI., 248-204-5900 · DRAFT		DR KD · CK BM · SKETCH NO. FIG. 5-2

Y:\Projects\WDNR\SaintLouisBaySlips\MXDs\Oil Barge Dock Slip Cross Section Fig 8.mxd

Tables

Table 3-1
Geotechnical Data
General Mills - Superior, WI

Parameter		Units	2022-GT-GM-01	2022-GT-GM-02	2022-GT-GM-02
		Sample Date	7/28/2022	7/28/2022	7/28/2022
		Sample Depth (ft bss)	4-5.3	2-3.5	5-6
Parameter		Units	Result	Result	Result
Percent Moisture (ASTM D2974-87)		%	38.2	43.6	17.7
LLOYD KAHN - TOTAL ORGANIC CARBON		mg/kg	43,200	26,400	2,210
Easting		WISCRS-DC-FT	145,550.74	145,548.87	145,548.87
		SP83-WI-N-FT	1,439,544.80	1,439,559.60	1,439,559.60
Northing		WISCRS-DC-FT	312,587.13	313,279.85	313,279.85
		SP83-WI-N-FT	580,855.76	581,548.29	581,548.29
Latitude		WGS84-DC-DD	46.74027072	46.74216995	46.74216995
		WGS84-WI-N-DD	46.7402690	46.7421682	46.7421682
Longitude		WGS84-DC-DD	-92.10988893	-92.10990321	-92.10990321
		WGS84-WI-N-DD	-92.1098877	-92.1099021	-92.1099021
Surface Sediment Elevation		IGLD85-FT	585.21	574.18	574.18
PARTICLE SIZE ASTM D6913/D7928	Sieve 3.0"	%	100.0	100.0	100.0
	Sieve 2.0"	%	100.0	100.0	100.0
	Sieve 1.5"	%	100.0	100.0	100.0
	Sieve 1.0"	%	100.0	100.0	100.0
	Sieve 0.75"	%	100.0	100.0	100.0
	Sieve 0.375"	%	100.0	100.0	100.0
	Sieve #4	%	100.0	100.0	100.0
	Sieve #10	%	99.5	100.0	100.0
	Sieve #20	%	98.6	99.9	100.0
	Sieve #40	%	95.8	99.0	99.9
	Sieve #60	%	90.8	95.6	99.4
	Sieve #100	%	83.3	87.7	98.6
	Sieve #140	%	75.3	78.5	96.6
	Sieve #200	%	63.9	67.0	89.6
	Hydrometer 1 Passing	%	41.2	44.8	61.2
	Hydrometer 2 Passing	%	29.6	35.6	45.2
	Hydrometer 3 Passing	%	23.9	32.0	31.0
	Hydrometer 4 Passing	%	16.2	24.6	15.0
	Hydrometer 5 Passing	%	16.2	19.1	11.9
	Hydrometer 6 Passing	%	14.7	17.7	10.1
	Hydrometer 7 Passing	%	10.9	14.1	8.3
	Hydrometer 8 Passing	%	6.6	9.9	6.1

Notes:

WISCRS-DC-FT = Coordinates presented in NAD83 Wisconsin Coordinate Reference System-Douglas County (DC) in U.S. Feet (ft).

WGS84-DC-DD = Coordinates presented in World Geodetic System (WGS) in decimal degrees (dd) based on Douglas County Coordinates.

SP83-WI-N-FT = Coordinates presented in NAD83 Wisconsin-North State Plane Reference System in U.S. Feet (ft)

WGS84-WI-N-DD = Coordinates presented in World Geodetic System (WGS) in decimal degrees (dd) based on Wisconsin North State Plane Coordinates.

IGLD85-FT = Elevation presented in International Great Lakes Datum (IGLD) 1985 in U.S. Feet (ft).

ASTM = American Society for Testing and Materials

ft bss - feet below sediment surface.

mg/kg - milligrams per kilogram.

% = percent

" = inch

Table 3-2
Treatability Sample Locations and Water Parameters
General Mills - Superior, WI

	Location ID	2022-TS-GM-01	2022-TS-GM-02
	Sample Date	7/30/2022	7/30/2022
Parameter	Units	N	N
Sample Location Details			
Easting	WISCRS-DC-FT	145511.842	145455.003
Northing	WISCRS-DC-FT	313055.553	312252.014
Latitude	WGS84-DC-DD	46.74155474	-92.11004867
Longitude	WGS84-DC-DD	46.73935126	-92.11026747
Easting	SP83-WI-N-FT	1439517.151	1439440.96
Northing	SP83-WI-N-FT	581324.9602	580523.0626
Latitude	WGS84-WI-N-DD	46.74027072	-92.10988893
Longitude	WGS84-WI-N-DD	46.74216995	-92.10990321
Surface Water Elevation	IGLD85-FT	604.29	603.96
Water Quality Parameters			
Dissolved Oxygen	mg/L	7.84	7.64
Specific Conductance	µS/cm	163.2	162
Temperature	C°	21.3	21.2
pH	Standard Units	7.29	7.34

Notes:

WISCRS-DC-FT = Coordinates presented in NAD83 Wisconsin Coordinate Reference System-Douglas County (DC) in U.S. Feet (ft).

WGS84-DC-DD = Coordinates presented in World Geodetic System (WGS) in decimal degrees (dd) based on Douglas County Coordinates.

SP83-WI-N-FT = Coordinates presented in NAD83 Wisconsin-North State Plane Reference System in U.S. Feet (ft)

WGS84-WI-N-DD = Coordinates presented in World Geodetic System (WGS) in decimal degrees (dd) based on Wisconsine North State Plane Coordinates.

IGLD85-FT = Elevation presented in International Great Lakes Datum (IGLD) 1985 in U.S. Feet (ft).

mg/L - milligram per liter

µS/cm - millisiemens per centimeter

C° - celcius

Water parameters collected with a YSI water quality meter.

N = Normal Sample

Table 4-1.1
2015 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	SW15-SLB04		SW15-SLB04		SW15-SLB05		SW15-SLB05		SW15-SLB05	
								Sample ID	SW15-SLB04-SURF_7/14/2015 2:00:00 PM		SW15-SLB04-0520_7/13/2015 3:45:00 PM		SW15-SLB05-SURF_7/8/2015 4:25:00 PM		SW15-SLB05-0520_7/9/2015 9:48:00 AM		SW15-SLB05-0520-FD_7/9/2015 9:48:00 AM	
								Parent Sample ID	--		--		--		--		SW15-SLB05-0520-FD_7/9/2015 9:48:00 AM	
								Date	07-14-2015		07-13-2015		07-08-2015		07-09-2015		07-09-2015	
								Sample Depth (ft bss)	0 - 0.5		0.5 - 2		0 - 0.5		0.5 - 2		0.5 - 2	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		FD	
Polycyclic Aromatic Hydrocarbons																		
C1-Chrysenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	74	J	190	J	520	J	730	J	370	J
C1-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	390	J	920	J	3100	J	3100	J	1800	J
C1-Fluorenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 34		< 150		< 370		< 590		< 230	
C1-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 34		< 150		< 370		< 590		< 230	
C1-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	180	J	550	J	1400	J	1900	J	920	J
C2-Chrysenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	110	J	190	J	540	J	< 590		430	J
C2-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	240	J	400	J	1100	J	1300	J	720	J
C2-Fluorenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	70	J	< 150		< 370		< 590		< 230	
C2-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	110	J	330	J	< 370		610	J	390	J
C2-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	160	J	340	J	850	J	1100	J	570	J
C3-Chrysenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	64	J	< 150		< 370		< 590		< 230	
C3-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	160	J	270	J	430	J	< 590		390	J
C3-Fluorenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	84	J	< 150		< 370		< 590		< 230	
C3-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	180	J	330	J	460	J	660	J	450	J
C3-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	660	J	300	J	710	J	1300	J	720	J
C4-Chrysenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	56	J	170	J	< 370		< 590		280	J
C4-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	180	J	150	J	< 370		< 590		< 230	
C4-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	110	J	230	J	1100	J	1100	J	860	J
1-Methylnaphthalene	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 34		< 150		< 370		< 590		< 230	
2-Methylnaphthalene	SOM02.2/SV SIM	20.2	111	201	402	1005	--	µg/kg	27	J	100	J	< 370		180	J	120	J
Acenaphthene	SOM02.2/SV SIM	6.7	48	89	178	445	--	µg/kg	19	J	140	J	130	J	370	J	270	
Acenaphthylene	SOM02.2/SV SIM	5.9	67	128	256	640	--	µg/kg	< 34		14	J	120	J	< 590		20	J
Anthracene	SOM02.2/SV SIM	57.2	451	845	1690	4225	--	µg/kg	48		310		820		990		460	
Benzo (a) anthracene	SOM02.2/SV SIM	108	579	1050	2100	5250	--	µg/kg	150		570		1800		1700		1100	
Benzo (a) pyrene	SOM02.2/SV SIM	150	800	1450	2900	7250	710	µg/kg	120		470		1300		1300		820	
Benzo (b) fluoranthene	SOM02.2/SV SIM	240	6820	13400	26800	67000	--	µg/kg	160		410		1300		1800		870	
Benzo (ghi) perylene	SOM02.2/SV SIM	170	1685	3200	6400	16000	--	µg/kg	67		240		550		720		340	
Benzo (k) fluoranthene	SOM02.2/SV SIM	240	6820	13400	26800	67000	--	µg/kg	120		390		1200		730		910	
Benzo(e)pyrene	SOM02.2/SV SIM	150	800	1450	2900	7250	--	µg/kg	110		300		800		860		640	
Chrysene	SOM02.2/SV SIM	166	728	1290	2580	6450	--	µg/kg	150		560		1500		2000		1100	
Dibenz (a,h) anthracene	SOM02.2/SV SIM	33	84	135	270	675	--	µg/kg	31	J	120	J	190	J	200	J	160	J
Fluoranthene	SOM02.2/SV SIM	423	1327	2230	4460	11150	--	µg/kg	440		1300		3900		4600		2800	
Fluorene	SOM02.2/SV SIM	77.4	307	536	1072	2680	--	µg/kg	40		150		210	J	560	J	370	
Indeno (1,2,3-cd) pyrene	SOM02.2/SV SIM	200	1700	3200	6400	16000	--	µg/kg	78		240		620		630		340	
Naphthalene	SOM02.2/SV SIM	176	369	561	1122	2805	--	µg/kg	43		100	J	68	J	260	J	200	J
Perylene	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	160		190		470		< 590		310	
Phenanthrene	SOM02.2/SV SIM	204	687	1170	2340	5850	--	µg/kg	230		1300		1600		4400		2400	
Pyrene	SOM02.2/SV SIM	195	858	1520	3040	7600	--	µg/kg	240		1100		2100		5000		2300	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	2100		7800		18000		26000		15000	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	2100		7800		18000		26000		15000	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	2100		7800		18000		27000		15000	

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Table 4-1.1
2015 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	SW15-SLB04		SW15-SLB04		SW15-SLB05		SW15-SLB05		SW15-SLB05	
								Sample ID	SW15-SLB04-SURF_7/14/2015 2:00:00 PM		SW15-SLB04-0520_7/13/2015 3:45:00 PM		SW15-SLB05-SURF_7/8/2015 4:25:00 PM		SW15-SLB05-0520_7/9/2015 9:48:00 AM		SW15-SLB05-0520-FD_7/9/2015 9:48:00 AM	
								Parent Sample ID	--		--		--		--		SW15-SLB05-0520-FD_7/9/2015 9:48:00 AM	
								Date	07-14-2015		07-13-2015		07-08-2015		07-09-2015		07-09-2015	
								Sample Depth (ft bss)	0 - 0.5		0.5 - 2		0 - 0.5		0.5 - 2		0.5 - 2	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**N**		**FD**	
Metals																		
Aluminum	ISM02	--	--	--	--	--	--	µg/kg	9680000		11800000		11300000		9530000		9750000	
Antimony	ISM02	2000	13500	25000	50000	125000	--	µg/kg	< 9300	UJ	< 7400	UJ	510	J	< 7600	UJ	500	J
Arsenic	ISM02	9800	21400	33000	66000	165000	7200	µg/kg	4700		4000		4500		4200		5300	
Barium	ISM02	--	--	--	--	--	--	µg/kg	141000		85700		115000		96500		96700	
Beryllium	ISM02	--	--	--	--	--	--	µg/kg	470	J	660		520	J	430	J	450	J
Cadmium	ISM02	990	3000	5000	10000	25000	--	µg/kg	< 770		< 620		520	J	530	J	640	J
Calcium	ISM02	--	--	--	--	--	--	µg/kg	12100000		15900000		14800000		11500000	*	14700000	
Chromium	ISM02	43000	76500	110000	220000	550000	47000	µg/kg	22800	J	24000	J	25900		22900		22800	
Cobalt	ISM02	--	--	--	--	--	--	µg/kg	7400	J	8400		9300	J	7500		8100	J
Copper	ISM02	32000	91000	150000	300000	750000	50000	µg/kg	15700		21600		28300		**32600**		**43000**	
Iron	ISM02	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	**20700000**	**J**	**21700000**	**J**	**22300000**		19600000		18800000	
Lead	ISM02	36000	83000	130000	260000	650000	75000	µg/kg	10800		23000		28900		**52200**		31100	
Magnesium	ISM02	--	--	--	--	--	--	µg/kg	8720000		9420000		10200000		7980000	*	9550000	
Manganese	ISM02	460000	780000	1100000	2200000	5500000	1039000	µg/kg	**595000**	*****	364000	*	**575000**		326000	*	359000	
Mercury	ISM02	180	640	1100	2200	5500	590	µg/kg	65	J	53	J	160	J-	130	J	70	J-
Nickel	ISM02	23000	36000	49000	98000	245000	38000	µg/kg	15900		18100		21900		17300		19200	
Potassium	ISM02	--	--	--	--	--	--	µg/kg	1290000		1710000		1330000		1110000		1140000	
Selenium	ISM02	--	--	--	--	--	--	µg/kg	1200	J	940	J	< 7000		790	J	< 6200	
Silver	ISM02	1600	1900	2200	4400	11000	--	µg/kg	< 1500		< 1200		**< 2000**		< 1300		**< 1800**	
Sodium	ISM02	--	--	--	--	--	--	µg/kg	323000	J	349000	J	288000	J	283000	J	279000	J
Thallium	ISM02	--	--	--	--	--	--	µg/kg	< 3900		< 3100		< 5000	UJ	< 3200	UJ	< 4400	UJ
Vanadium	ISM02	--	--	--	--	--	--	µg/kg	34400	J	34900	J	34700		34400		34700	
Zinc	ISM02	120000	290000	460000	920000	2300000	210000	µg/kg	65700		76400		104000		119000		**135000**	
AVS/SEM																		
Acid volatile sulfides	AVS	--	--	--	--	--	--	µg/kg	< 31500		-		334000		148000		-	
Acid volatile sulfides	AVS_UM/G	--	--	--	--	--	--	µg/kg	< 980		-		10400		4600		-	
Acid volatile sulfides	SW6010	--	--	--	--	--	--	µg/kg	0		-		66.8		379		-	
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	**< 2400**		-		**< 2600**		560	J	-	
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	6800	J	-		5500	J	5600	J	-	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	9400		-		6800	J	29200	J	-	
Mercury	SW7470	180	640	1100	2200	5500	590	µg/kg	< 9.9		-		< 11		< 8.8		-	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	8500	J	-		3400	J	5300	J	-	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	51600		-		33900	J	93200	J	-	
Cadmium	SW6010_SEM	990	3000	5000	10000	25000	--	µg/kg	< 21		-		< 23		5	J	-	
Copper	SW6010_SEM	32000	91000	150000	300000	750000	50000	µg/kg	110	J	-		87	J	89	J	-	
Lead	SW6010_SEM	36000	83000	130000	260000	650000	75000	µg/kg	45		-		33	J	140	J	-	
Mercury	SW7470_SEM	180	640	1100	2200	5500	590	µg/kg	< 0.0490		-		< 0.0550		< 0.0440		-	
Nickel	SW6010_SEM	23000	36000	49000	98000	245000	38000	µg/kg	140	J	-		57	J	91	J	-	
Zinc	SW6010_SEM	120000	290000	460000	920000	2300000	210000	µg/kg	790		-		520	J	1400	J	-	

Table 4-1.1
2015 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	SW15-SLB04		SW15-SLB04		SW15-SLB05		SW15-SLB05		SW15-SLB05	
								Sample ID	SW15-SLB04-SURF_7/14/2015 2:00:00 PM		SW15-SLB04-0520_7/13/2015 3:45:00 PM		SW15-SLB05-SURF_7/8/2015 4:25:00 PM		SW15-SLB05-0520_7/9/2015 9:48:00 AM		SW15-SLB05-0520-FD_7/9/2015 9:48:00 AM	
								Parent Sample ID	--		--		--		--		SW15-SLB05-0520-FD_7/9/2015 9:48:00 AM	
								Date	07-14-2015		07-13-2015		07-08-2015		07-09-2015		07-09-2015	
								Sample Depth (ft bss)	0 - 0.5		0.5 - 2		0 - 0.5		0.5 - 2		0.5 - 2	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**N**		**FD**	
Polychlorinated Biphenyls																		
Aroclor 1016	SOM02.2	--	--	--	--	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Aroclor 1221	SOM02.2	--	--	--	--	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Aroclor 1232	SOM02.2	--	--	--	--	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Aroclor 1242	SOM02.2	--	--	--	--	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Aroclor 1248	SOM02.2	--	--	--	--	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Aroclor 1254	SOM02.2	--	--	--	--	--	--	µg/kg	< 69		12	J	< 74		36	J	78	J
Aroclor 1260	SOM02.2	--	--	--	--	--	--	µg/kg	< 69		7.7	J	13	J	14	J	49	J
Aroclor 1262	SOM02.2	--	--	--	--	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Aroclor 1268	SOM02.2	--	--	--	--	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Total PCBs (NDs=0)	Calculated	60	368	676	1352	3380	110	µg/kg	0		19.7		13		50		**127**	
Organotins																		
Dibutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		-		< 2.9		< 2.4		-	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		-		< 47	UJ	< 38	UJ	-	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		< 3.8		< 3.1		-	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	-		-		**14**		**23**		-	
Pesticides																		
4,4'-DDD	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		9.9		27		-	
4,4'-DDE	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		3.5	J	1.4	J	-	
4,4'-DDT	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		11	J	1.8	J	-	
Aldrin	SOM02.2	2	41	80	160	400	--	µg/kg	-		-		**< 4**	**UJ**	**< 3.1**	**UJ**	-	
alpha-BHC	SOM02.2	6	53	100	200	500	--	µg/kg	-		-		< 4		< 3.1		-	
alpha-Chlordane	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 4		< 3.1		-	
beta-BHC	SOM02.2	5	108	210	420	1050	--	µg/kg	-		-		< 4		< 3.1		-	
beta-Chlordane	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 4		< 3.1		-	
delta-BHC	SOM02.2	3	62	120	240	600	--	µg/kg	-		-		**< 4**		**< 3.1**		-	
Dieldrin	SOM02.2	1.9	32	62	124	310	--	µg/kg	-		-		**< 7.7**		0.92	J	-	
Endosulfan I	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 4		< 3.1		-	
Endosulfan II	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 7.7		< 6.1		-	
Endosulfan Sulfate	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 7.7		< 6.1		-	
Endrin	SOM02.2	2.2	104.6	207	414	1035	--	µg/kg	-		-		**< 7.7**	**UJ**	**< 6.1**	**UJ**	-	
Endrin Aldehyde	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 7.7		< 6.1		-	
Endrin Ketone	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 7.7		< 6.1		-	
gamma-BHC (Lindane)	SOM02.2	3	4	5	10	25	--	µg/kg	-		-		**< 4**	**UJ**	**< 3.1**	**UJ**	-	
Heptachlor	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 4	UJ	< 3.1	UJ	-	
Heptachlor Epoxide	SOM02.2	2.5	9.3	16	32	80	--	µg/kg	-		-		**< 4**		0.78	J	-	
Methoxychlor	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 40		< 31		-	
Total DDT	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		24.4	J	30.2	J	-	
Toxaphene	SOM02.2	1	1.5	2	4	10	--	µg/kg	-		-		**< 400**		**< 310**		-	
Other																		
Moisture	D2216	--	--	--	--	--	--	%	94.4		43.7		120		80		77	
Total Solids	E160.3	--	--	--	--	--	--	%	48.6		68.7		43.4		54.4		56	
Total Organic Carbon	TOC	--	--	--	--	--	--	mg/kg	49400		27000		44200		36500	J	46900	

Table 4-1.1
2015 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	SW15-SLB05		SW15-SLB05		SW15-SLB06		SW15-SLB06		SW15-SLB06			
								Sample ID	SW15-SLB05-2040_7/9/2015 9:47:00 AM		SW15-SLB05-4060_7/9/2015 9:49:00 AM		SW15-SLB06-SURF_7/8/2015 3:38:00 PM		SW15-SLB06-0520_7/9/2015 8:40:00 AM		SW15-SLB06-0520-FD_7/9/2015 8:40:00 AM			
								Parent Sample ID	--		--		--		--		SW15-SLB06-0520-FD_7/9/2015 8:40:00 AM			
								Date	07-09-2015		07-09-2015		07-08-2015		07-09-2015		07-09-2015			
								Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.5		0.5 - 2		0.5 - 2			
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**N**		**FD**			
Polycyclic Aromatic Hydrocarbons																				
C1-Chrysenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	1700	J	100	J	-		-		-			
C1-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	7100	J	490	J	-		-		-			
C1-Fluorenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 1100		< 82		-		-		-			
C1-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 1100		< 82		-		-		-			
C1-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	5500	J	240	J	-		-		-			
C2-Chrysenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	1500	J	120	J	-		-		-			
C2-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	2600	J	210	J	-		-		-			
C2-Fluorenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 1100		< 82		-		-		-			
C2-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 1100		110	J	-		-		-			
C2-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	2600	J	220	J	-		-		-			
C3-Chrysenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 1100		< 82		-		-		-			
C3-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	1600	J	130	J	-		-		-			
C3-Fluorenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 1100		< 82		-		-		-			
C3-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	1200	J	170	J	-		-		-			
C3-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	2200	J	280	J	-		-		-			
C4-Chrysenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 1100		86	J	-		-		-			
C4-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 1100		99	J	-		-		-			
C4-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	1300	J	210	J	-		-		-			
1-Methylnaphthalene	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 1100		< 82		-		-		-			
2-Methylnaphthalene	SOM02.2/SV SIM	20.2	111	201	402	1005	--	µg/kg	**170**	**J**	**27**	**J**	**69**	**J**	**120**	**J**	-			
Acenaphthene	SOM02.2/SV SIM	6.7	48	89	178	445	--	µg/kg	**430**	**J**	**68**	**J**	**140**		**200**	**J**	-			
Acenaphthylene	SOM02.2/SV SIM	5.9	67	128	256	640	--	µg/kg	< 1100		< 82		**23**	**J**	**27**	**J**	-			
Anthracene	SOM02.2/SV SIM	57.2	451	845	1690	4225	--	µg/kg	**2000**		**110**		**190**		**350**		-			
Benzo (a) anthracene	SOM02.2/SV SIM	108	579	1050	2100	5250	--	µg/kg	**4100**		**260**		**370**		**730**		-			
Benzo (a) pyrene	SOM02.2/SV SIM	150	800	1450	2900	7250	710	µg/kg	**2400**		**170**		**310**		**600**		-			
Benzo (b) fluoranthene	SOM02.2/SV SIM	240	6820	13400	26800	67000	--	µg/kg	**2100**		220		**420**		**650**		-			
Benzo (ghi) perylene	SOM02.2/SV SIM	170	1685	3200	6400	16000	--	µg/kg	**1200**		87		130	J	**250**		-			
Benzo (k) fluoranthene	SOM02.2/SV SIM	240	6820	13400	26800	67000	--	µg/kg	**2500**		180		**330**		**640**		-			
Benzo(e)pyrene	SOM02.2/SV SIM	150	800	1450	2900	7250	--	µg/kg	**1600**		140		-		-		-			
Chrysene	SOM02.2/SV SIM	166	728	1290	2580	6450	--	µg/kg	**3500**		**260**		**530**		**940**		-			
Dibenz (a,h) anthracene	SOM02.2/SV SIM	33	84	135	270	675	--	µg/kg	**380**	**J**	**35**	**J**	**49**	**J**	**98**	**J**	-			
Fluoranthene	SOM02.2/SV SIM	423	1327	2230	4460	11150	--	µg/kg	**8100**		**870**		**1400**		**2300**		-			
Fluorene	SOM02.2/SV SIM	77.4	307	536	1072	2680	--	µg/kg	**630**	**J**	72	J	**240**		**350**		-			
Indeno (1,2,3-cd) pyrene	SOM02.2/SV SIM	200	1700	3200	6400	16000	--	µg/kg	**1200**		82		140		**270**		-			
Naphthalene	SOM02.2/SV SIM	176	369	561	1122	2805	--	µg/kg	**230**	**J**	35	J	90	J	150	J	-			
Perylene	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	< 1100		< 82		-		-		-			
Phenanthrene	SOM02.2/SV SIM	204	687	1170	2340	5850	--	µg/kg	**5200**		**560**		**510**		**1300**		-			
Pyrene	SOM02.2/SV SIM	195	858	1520	3040	7600	--	µg/kg	**5700**		**560**		**900**		**1500**		-			
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**41000**		**3700**		**5800**		**10000**		-			
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**41000**		**3700**		**5800**		**10000**		-			
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**42000**		**3800**		**5800**		**10000**		-			

Table 4-1.1
2015 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	SW15-SLB05		SW15-SLB05		SW15-SLB06		SW15-SLB06		SW15-SLB06	
								Sample ID	SW15-SLB05-2040_7/9/2015 9:47:00 AM		SW15-SLB05-4060_7/9/2015 9:49:00 AM		SW15-SLB06-SURF_7/8/2015 3:38:00 PM		SW15-SLB06-0520_7/9/2015 8:40:00 AM		SW15-SLB06-0520-FD_7/9/2015 8:40:00 AM	
								Parent Sample ID	--		--		--		--		SW15-SLB06-0520-FD_7/9/2015 8:40:00 AM	
								Date	07-09-2015		07-09-2015		07-08-2015		07-09-2015		07-09-2015	
								Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.5		0.5 - 2		0.5 - 2	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		FD	
Metals																		
Aluminum	ISM02	--	--	--	--	--	--	µg/kg	7510000		3270000		16700000		13600000		-	
Antimony	ISM02	2000	13500	25000	50000	125000	--	µg/kg	520	J	< 5700		< 13700		490	J	-	
Arsenic	ISM02	9800	21400	33000	66000	165000	7200	µg/kg	4400		1900		5400		5700		-	
Barium	ISM02	--	--	--	--	--	--	µg/kg	65900		26400		218000		149000		-	
Beryllium	ISM02	--	--	--	--	--	--	µg/kg	400	J	170	J	740	J	640	J	-	
Cadmium	ISM02	990	3000	5000	10000	25000	--	µg/kg	730	J	280	J	710	J	**1100**	**J+**	-	
Calcium	ISM02	--	--	--	--	--	--	µg/kg	14400000		24100000		14400000		17700000		-	
Chromium	ISM02	43000	76500	110000	220000	550000	47000	µg/kg	19500		7000		37400		33300		-	
Cobalt	ISM02	--	--	--	--	--	--	µg/kg	6600	J	3300	J	12000		11000		-	
Copper	ISM02	32000	91000	150000	300000	750000	50000	µg/kg	**42900**		7700		**43700**		**59700**		-	
Iron	ISM02	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	16100000		7300000		**32500000**		**24800000**		-	
Lead	ISM02	36000	83000	130000	260000	650000	75000	µg/kg	**50900**		4000		27200		**51100**		-	
Magnesium	ISM02	--	--	--	--	--	--	µg/kg	8370000		9270000		12000000		12100000		-	
Manganese	ISM02	460000	780000	1100000	2200000	5500000	1039000	µg/kg	255000		218000		**629000**		**463000**		-	
Mercury	ISM02	180	640	1100	2200	5500	590	µg/kg	**200**		< 120	UJ	95	J-	**< 210**	**UJ**	-	
Nickel	ISM02	23000	36000	49000	98000	245000	38000	µg/kg	16700		8500		**29400**		**27100**		-	
Potassium	ISM02	--	--	--	--	--	--	µg/kg	906000		412000	J	2100000		1580000		-	
Selenium	ISM02	--	--	--	--	--	--	µg/kg	< 5300		< 3300		1300	J	< 6600		-	
Silver	ISM02	1600	1900	2200	4400	11000	--	µg/kg	140	J	< 960		< 2300		270	J	-	
Sodium	ISM02	--	--	--	--	--	--	µg/kg	214000	J	154000	J	372000	J	319000	J	-	
Thallium	ISM02	--	--	--	--	--	--	µg/kg	< 3800	UJ	< 2400	UJ	< 5700	UJ	< 4700	UJ	-	
Vanadium	ISM02	--	--	--	--	--	--	µg/kg	27500		16000		47000		38100		-	
Zinc	ISM02	120000	290000	460000	920000	2300000	210000	µg/kg	**175000**		26500		**136000**		**203000**		-	
AVS/SEM																		
Acid volatile sulfides	AVS	--	--	--	--	--	--	µg/kg	-		-		156000		-		-	
Acid volatile sulfides	AVS_UM/G	--	--	--	--	--	--	µg/kg	-		-		4900		-		-	
Acid volatile sulfides	SW6010	--	--	--	--	--	--	µg/kg	-		-		312		-		-	
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	-		-		< 3300		-		-	
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	-		-		7100	J	-		-	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	-		-		18800	J	-		-	
Mercury	SW7470	180	640	1100	2200	5500	590	µg/kg	-		-		< 14		-		-	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	-		-		6400	J	-		-	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	-		-		78800	J	-		-	
Cadmium	SW6010_SEM	990	3000	5000	10000	25000	--	µg/kg	-		-		< 30		-		-	
Copper	SW6010_SEM	32000	91000	150000	300000	750000	50000	µg/kg	-		-		110	J	-		-	
Lead	SW6010_SEM	36000	83000	130000	260000	650000	75000	µg/kg	-		-		91	J	-		-	
Mercury	SW7470_SEM	180	640	1100	2200	5500	590	µg/kg	-		-		< 0.0690		-		-	
Nickel	SW6010_SEM	23000	36000	49000	98000	245000	38000	µg/kg	-		-		110	J	-		-	
Zinc	SW6010_SEM	120000	290000	460000	920000	2300000	210000	µg/kg	-		-		1200	J	-		-	

Table 4-1.1
2015 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	SW15-SLB05		SW15-SLB05		SW15-SLB06		SW15-SLB06		SW15-SLB06	
								Sample ID	SW15-SLB05-2040_7/9/2015 9:47:00 AM		SW15-SLB05-4060_7/9/2015 9:49:00 AM		SW15-SLB06-SURF_7/8/2015 3:38:00 PM		SW15-SLB06-0520_7/9/2015 8:40:00 AM		SW15-SLB06-0520-FD_7/9/2015 8:40:00 AM	
								Parent Sample ID	--		--		--		--		SW15-SLB06-0520-FD_7/9/2015 8:40:00 AM	
								Date	07-09-2015		07-09-2015		07-08-2015		07-09-2015		07-09-2015	
								Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.5		0.5 - 2		0.5 - 2	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		FD	
Polychlorinated Biphenyls																		
Aroclor 1016	SOM02.2	--	--	--	--	--	--	µg/kg	< 56		-		< 56		< 71		-	
Aroclor 1221	SOM02.2	--	--	--	--	--	--	µg/kg	< 56		-		< 56		< 71		-	
Aroclor 1232	SOM02.2	--	--	--	--	--	--	µg/kg	< 56		-		< 56		< 71		-	
Aroclor 1242	SOM02.2	--	--	--	--	--	--	µg/kg	< 56		-		< 56		< 71		-	
Aroclor 1248	SOM02.2	--	--	--	--	--	--	µg/kg	< 56		-		< 56		< 71		-	
Aroclor 1254	SOM02.2	--	--	--	--	--	--	µg/kg	140	J	-		< 56		< 71		-	
Aroclor 1260	SOM02.2	--	--	--	--	--	--	µg/kg	58		-		17	J	30	J	-	
Aroclor 1262	SOM02.2	--	--	--	--	--	--	µg/kg	< 56		-		< 56		< 71		-	
Aroclor 1268	SOM02.2	--	--	--	--	--	--	µg/kg	< 56		-		< 56		< 71		-	
Total PCBs (NDs=0)	Calculated	60	368	676	1352	3380	110	µg/kg	**198**		-		17		30		-	
Organotins																		
Dibutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	-		-		-		-		-	
Pesticides																		
4,4'-DDD	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		110		81		87	
4,4'-DDE	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		5.5	J	< 72		4.6	J
4,4'-DDT	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		5.7	J	190	J	4.7	J
Aldrin	SOM02.2	2	41	80	160	400	--	µg/kg	-		-		**< 4.9**	**UJ**	**< 37**	**UJ**	**< 3.3**	**UJ**
alpha-BHC	SOM02.2	6	53	100	200	500	--	µg/kg	-		-		< 4.9		**< 37**		< 3.3	
alpha-Chlordane	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 4.9		< 37		< 3.3	
beta-BHC	SOM02.2	5	108	210	420	1050	--	µg/kg	-		-		< 4.9		**< 37**		0.62	J
beta-Chlordane	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 4.9		< 37		< 3.3	
delta-BHC	SOM02.2	3	62	120	240	600	--	µg/kg	-		-		**< 4.9**		**< 37**		**< 3.3**	
Dieldrin	SOM02.2	1.9	32	62	124	310	--	µg/kg	-		-		**< 9.4**		**< 72**		1.2	J
Endosulfan I	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 4.9		< 37		< 3.3	
Endosulfan II	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 9.4		< 72		< 6.3	
Endosulfan Sulfate	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 9.4		< 72		1.3	J
Endrin	SOM02.2	2.2	104.6	207	414	1035	--	µg/kg	-		-		**< 9.4**	**UJ**	**< 72**	**UJ**	**< 6.3**	**UJ**
Endrin Aldehyde	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 9.4		< 72		< 6.3	
Endrin Ketone	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 9.4		< 72		1.3	J
gamma-BHC (Lindane)	SOM02.2	3	4	5	10	25	--	µg/kg	-		-		**< 4.9**	**UJ**	**< 37**	**UJ**	**< 3.3**	**UJ**
Heptachlor	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 4.9	UJ	< 37	UJ	< 3.3	UJ
Heptachlor Epoxide	SOM02.2	2.5	9.3	16	32	80	--	µg/kg	-		-		**< 4.9**		**< 37**		1.2	J
Methoxychlor	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 49		< 370		< 33	
Total DDT	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		121.2	J	271	J	96.3	J
Toxaphene	SOM02.2	1	1.5	2	4	10	--	µg/kg	-		-		**< 490**		**< 3700**		**< 330**	
Other																		
Moisture	D2216	--	--	--	--	--	--	%	76		28		190		120		-	
Total Solids	E160.3	--	--	--	--	--	--	%	57.8		78.7		34.8		45.3		51.8	
Total Organic Carbon	TOC	--	--	--	--	--	--	mg/kg	44500		5830		100000		64600		-	

Table 4-1.1
2015 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	SW15-SLB06		SW15-SLB06		SW15-SLB07	
								Sample ID	SW15-SLB06-2040_7/9/2015 8:38:00 AM		SW15-SLB06-4060_7/9/2015 8:42:00 AM		SW15-SLB07-SURF_7/8/2015 2:40:00 PM	
								Parent Sample ID	--		--		--	
								Date	07-09-2015		07-09-2015		07-08-2015	
								Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.5	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N	
Polycyclic Aromatic Hydrocarbons														
C1-Chrysenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C1-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C1-Fluorenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C1-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C1-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C2-Chrysenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C2-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C2-Fluorenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C2-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C2-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C3-Chrysenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C3-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C3-Fluorenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C3-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C3-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C4-Chrysenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C4-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
C4-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
1-Methylnaphthalene	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
2-Methylnaphthalene	SOM02.2/SV SIM	20.2	111	201	402	1005	--	µg/kg	490	J	1400		64	J
Acenaphthene	SOM02.2/SV SIM	6.7	48	89	178	445	--	µg/kg	820		4800		260	
Acenaphthylene	SOM02.2/SV SIM	5.9	67	128	256	640	--	µg/kg	63	J	120	J	< 110	
Anthracene	SOM02.2/SV SIM	57.2	451	845	1690	4225	--	µg/kg	1400		1700		290	
Benzo (a) anthracene	SOM02.2/SV SIM	108	579	1050	2100	5250	--	µg/kg	2700		2300		380	
Benzo (a) pyrene	SOM02.2/SV SIM	150	800	1450	2900	7250	710	µg/kg	2000		2000		310	
Benzo (b) fluoranthene	SOM02.2/SV SIM	240	6820	13400	26800	67000	--	µg/kg	2000		1700		330	
Benzo (ghi) perylene	SOM02.2/SV SIM	170	1685	3200	6400	16000	--	µg/kg	1000		710		120	
Benzo (k) fluoranthene	SOM02.2/SV SIM	240	6820	13400	26800	67000	--	µg/kg	2200		1900		350	
Benzo(e)pyrene	SOM02.2/SV SIM	150	800	1450	2900	7250	--	µg/kg	-		-		-	
Chrysene	SOM02.2/SV SIM	166	728	1290	2580	6450	--	µg/kg	2900		2600		470	
Dibenz (a,h) anthracene	SOM02.2/SV SIM	33	84	135	270	675	--	µg/kg	400	J	280	J	54	J
Fluoranthene	SOM02.2/SV SIM	423	1327	2230	4460	11150	--	µg/kg	7800		6600		1400	
Fluorene	SOM02.2/SV SIM	77.4	307	536	1072	2680	--	µg/kg	1000		3200		400	
Indeno (1,2,3-cd) pyrene	SOM02.2/SV SIM	200	1700	3200	6400	16000	--	µg/kg	1100		750		150	
Naphthalene	SOM02.2/SV SIM	176	369	561	1122	2805	--	µg/kg	600		2100		180	
Perylene	SOM02.2/SV SIM	--	--	--	--	--	--	µg/kg	-		-		-	
Phenanthrene	SOM02.2/SV SIM	204	687	1170	2340	5850	--	µg/kg	6400		8800		1400	
Pyrene	SOM02.2/SV SIM	195	858	1520	3040	7600	--	µg/kg	5600		5000		920	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	38000		46000		7100	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	38000		46000		7100	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	38000		46000		7100	

Table 4-1.1
2015 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	SW15-SLB06		SW15-SLB06		SW15-SLB07	
								Sample ID	SW15-SLB06-2040_7/9/2015 8:38:00 AM		SW15-SLB06-4060_7/9/2015 8:42:00 AM		SW15-SLB07-SURF_7/8/2015 2:40:00 PM	
								Parent Sample ID	--		--		--	
								Date	07-09-2015		07-09-2015		07-08-2015	
								Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.5	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**	
Metals														
Aluminum	ISM02	--	--	--	--	--	--	µg/kg	10900000		9100000		8500000	
Antimony	ISM02	2000	13500	25000	50000	125000	--	µg/kg	750	J	**2200**	**J**	< 7100	
Arsenic	ISM02	9800	21400	33000	66000	165000	7200	µg/kg	5000		6000		3400	
Barium	ISM02	--	--	--	--	--	--	µg/kg	98300		103000		67500	
Beryllium	ISM02	--	--	--	--	--	--	µg/kg	560	J	550	J	380	J
Cadmium	ISM02	990	3000	5000	10000	25000	--	µg/kg	**1000**	**J+**	**1400**	**J+**	350	J
Calcium	ISM02	--	--	--	--	--	--	µg/kg	15800000		13500000		11600000	
Chromium	ISM02	43000	76500	110000	220000	550000	47000	µg/kg	26400		23700		19700	
Cobalt	ISM02	--	--	--	--	--	--	µg/kg	8900		8100		7200	
Copper	ISM02	32000	91000	150000	300000	750000	50000	µg/kg	**58000**		**85800**		17900	
Iron	ISM02	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	**21800000**		**22400000**		17500000	
Lead	ISM02	36000	83000	130000	260000	650000	75000	µg/kg	**72500**		**115000**		14200	
Magnesium	ISM02	--	--	--	--	--	--	µg/kg	10400000		8810000		6950000	
Manganese	ISM02	460000	780000	1100000	2200000	5500000	1039000	µg/kg	337000		290000		**571000**	
Mercury	ISM02	180	640	1100	2200	5500	590	µg/kg	**340**		**450**		< 160	UJ
Nickel	ISM02	23000	36000	49000	98000	245000	38000	µg/kg	21700		19900		17100	
Potassium	ISM02	--	--	--	--	--	--	µg/kg	1270000		1100000		904000	
Selenium	ISM02	--	--	--	--	--	--	µg/kg	1000	J	1100	J	< 4100	
Silver	ISM02	1600	1900	2200	4400	11000	--	µg/kg	290	J	260	J	< 1200	
Sodium	ISM02	--	--	--	--	--	--	µg/kg	266000	J	239000	J	391000	J
Thallium	ISM02	--	--	--	--	--	--	µg/kg	< 3500	UJ	< 4000	UJ	< 2900	UJ
Vanadium	ISM02	--	--	--	--	--	--	µg/kg	34400		31200		29200	
Zinc	ISM02	120000	290000	460000	920000	2300000	210000	µg/kg	**221000**		**408000**		56500	
AVS/SEM														
Acid volatile sulfides	AVS	--	--	--	--	--	--	µg/kg	-		-		< 26400	
Acid volatile sulfides	AVS_UM/G	--	--	--	--	--	--	µg/kg	-		-		< 820	
Acid volatile sulfides	SW6010	--	--	--	--	--	--	µg/kg	-		-		0	
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	-		-		< 2000	
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	-		-		5000	J
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	-		-		8200	J
Mercury	SW7470	180	640	1100	2200	5500	590	µg/kg	-		-		< 8.3	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	-		-		3800	J
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	-		-		32800	J
Cadmium	SW6010_SEM	990	3000	5000	10000	25000	--	µg/kg	-		-		< 18	
Copper	SW6010_SEM	32000	91000	150000	300000	750000	50000	µg/kg	-		-		79	J
Lead	SW6010_SEM	36000	83000	130000	260000	650000	75000	µg/kg	-		-		39	J
Mercury	SW7470_SEM	180	640	1100	2200	5500	590	µg/kg	-		-		< 0.0410	
Nickel	SW6010_SEM	23000	36000	49000	98000	245000	38000	µg/kg	-		-		64	J
Zinc	SW6010_SEM	120000	290000	460000	920000	2300000	210000	µg/kg	-		-		500	J

Table 4-1.1
2015 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	SW15-SLB06		SW15-SLB06		SW15-SLB07	
								Sample ID	SW15-SLB06-2040_7/9/2015 8:38:00 AM		SW15-SLB06-4060_7/9/2015 8:42:00 AM		SW15-SLB07-SURF_7/8/2015 2:40:00 PM	
								Parent Sample ID	--		--		--	
								Date	07-09-2015		07-09-2015		07-08-2015	
								Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.5	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N	
Polychlorinated Biphenyls														
Aroclor 1016	SOM02.2	--	--	--	--	--	--	µg/kg	< 57		-		< 57	
Aroclor 1221	SOM02.2	--	--	--	--	--	--	µg/kg	< 57		-		< 57	
Aroclor 1232	SOM02.2	--	--	--	--	--	--	µg/kg	< 57		-		< 57	
Aroclor 1242	SOM02.2	--	--	--	--	--	--	µg/kg	< 57		-		< 57	
Aroclor 1248	SOM02.2	--	--	--	--	--	--	µg/kg	< 57		-		< 57	
Aroclor 1254	SOM02.2	--	--	--	--	--	--	µg/kg	< 57		-		< 57	
Aroclor 1260	SOM02.2	--	--	--	--	--	--	µg/kg	40	J	-		6	J
Aroclor 1262	SOM02.2	--	--	--	--	--	--	µg/kg	< 57		-		< 57	
Aroclor 1268	SOM02.2	--	--	--	--	--	--	µg/kg	< 57		-		< 57	
Total PCBs (NDs=0)	Calculated	60	368	676	1352	3380	110	µg/kg	40		-		6	
Organotins														
Dibutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	-		-		-	
Pesticides														
4,4'-DDD	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		1.1	J
4,4'-DDE	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 5.8	
4,4'-DDT	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		0.61	J
Aldrin	SOM02.2	2	41	80	160	400	--	µg/kg	-		-		< 3	UJ
alpha-BHC	SOM02.2	6	53	100	200	500	--	µg/kg	-		-		< 3	
alpha-Chlordane	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 3	
beta-BHC	SOM02.2	5	108	210	420	1050	--	µg/kg	-		-		< 3	
beta-Chlordane	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 3	
delta-BHC	SOM02.2	3	62	120	240	600	--	µg/kg	-		-		< 3	
Dieldrin	SOM02.2	1.9	32	62	124	310	--	µg/kg	-		-		< 5.8	
Endosulfan I	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 3	
Endosulfan II	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 5.8	
Endosulfan Sulfate	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 5.8	
Endrin	SOM02.2	2.2	104.6	207	414	1035	--	µg/kg	-		-		< 5.8	UJ
Endrin Aldehyde	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 5.8	
Endrin Ketone	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 5.8	
gamma-BHC (Lindane)	SOM02.2	3	4	5	10	25	--	µg/kg	-		-		< 3	UJ
Heptachlor	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 3	UJ
Heptachlor Epoxide	SOM02.2	2.5	9.3	16	32	80	--	µg/kg	-		-		< 3	
Methoxychlor	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		< 30	
Total DDT	SOM02.2	--	--	--	--	--	--	µg/kg	-		-		1.71	J
Toxaphene	SOM02.2	1	1.5	2	4	10	--	µg/kg	-		-		< 300	
Other														
Moisture	D2216	--	--	--	--	--	--	%	79		90		74	
Total Solids	E160.3	--	--	--	--	--	--	%	56.4		53.5		57.8	
Total Organic Carbon	TOC	--	--	--	--	--	--	mg/kg	60000		68400		24500	

Table 4-1.1
2015 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

Footnotes:
< : Denotes concentration less than indicated detection reporting limit
Values are shaded based on the highest comparison criteria exceeded.
WDNR = Wisconsin Department of Natural Resources
Exceeds WDNR-2003-TEC = WDNR -Consensus-Based Sediment Quality Guidelines. Interim Guidance. December 2003. (TEC-threshold effect concentration)
Exceeds WDNR-2003-MEC = WDNR -Consensus-Based Sediment Quality Guidelines. Interim Guidance. December 2003. (MEC-midpoint effect concentration)
Exceeds WDNR-2003-PEC = WDNR -Consensus-Based Sediment Quality Guidelines. Interim Guidance. December 2003.(PEC-probable effect concentration).
Exceeds WDNR-2003-2XPEC = 2 times PEC values.
Exceeds WDNR-2003-5XPEC = 5 times PEC values.
Exceeds SLR AOC BTVs = The calculated Background Threshold Values for Sediment Contaminants in the St. Louis River Area of Concern.
MDL = Method detection limit.
ND = Non Detect
N = Sample type is a normal sample.
FD = Sample type is a field duplicate sample.
RL = Reporting Limit
"-" = Not analyzed
"--" = No Standard/Guideline
PAH = Polycyclic Aromatic Hydrocarbons
PCB = Polychlorinated Biphenyls
µg/kg = microgram per kilogram
mg/kg = milligrams per kilograms
ft bss = feet below sediment surface
% = percent
AVS = Acid Volatile Sulfide
SEM = Simultaneously Extractable Metals
Total PAH 18 = The 18 PAHs used in this calculation are: 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(e)pyrene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-Cd)Pyrene, Naphthalene, Phenanthrene, and Pyrene.
Total PAH-18 (NDs=0): This calculation includes the sum of 18 PAHs. Analytes that were not detected were given a value of 0. Results of the calculation were rounded to 2 significant figures.
Total PAH-18 (NDs=0.5 MDL): This calculation includes the sum of 18 PAHs. Analytes that were not detected were given a value of half the Method Detection Limit (MDL) for that analyte. Results of the calculation were rounded to 2 significant figures.
Total PAH-18 (NDs=0.5 RL): This calculation includes the sum of 18 PAHs. Analytes that were not detected were given a value of half the Reporting Limit (RL) for that analyte. Results of the calculation were rounded to 2 significant figures.
* = Post-digestion spike at 2 times the parent concentration.
J = Indicates that the concentration was detected above the method detection limit but below the reporting limit. The concentration is an estimated value.
J+ = Result is estimated but biased high.
J- = Result is estimated but biased low.
UJ = Analyte is not detected above the reported limit and the limit is estimated.

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM01		ND20-GM01		ND20-GM01		ND20-GM02	
								Sample ID	ND20-GM01-SURF_06/28/2020		ND20-GM01-0320_07/02/2020		ND20-GM01-2040_07/02/2020		ND20-GM02-SURF_07/01/2020	
								Parent Sample ID	--		--		--		--	
								Date	06-28-2020		07-02-2020		07-02-2020		07-01-2020	
								Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		0 - 0.3	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N	
Metals																
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	15800000		12500000		9310000		18800000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	< 13000		< 10200		1000	J	< 14000	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	6000		5900		6500		6200	
Barium	SW6010	--	--	--	--	--	--	µg/kg	217000	*	142000		89100		209000	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	610	J	610	J	550	J	810	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	620	J	740	J	**1000**		610	J
Calcium	SW6010	--	--	--	--	--	--	µg/kg	10500000	*	11100000		14200000		11900000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	35300	J	33400		22000		40700	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	11200		9400		7200	J	12500	
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	**48500**		**62900**		**106000**		**46400**	
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	**30600000**		**25100000**		20000000		**36000000**	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	32600		**64300**		**90700**		29800	*
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	9720000	*	8430000		7750000		10900000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	**516000**		363000	*	273000	*	**708000**	
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	130	J	< 220		**410**		< 270	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	**28600**	**J**	**24000**		18800		**32200**	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	2030000		1670000		1210000		2550000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	1700	J	1200	J	< 5700		2000	J
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	< 2200		160	J	< 1600		< 2300	
Sodium	SW6010	--	--	--	--	--	--	µg/kg	324000	J	313000	J	288000	J	383000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 5400		< 4200		< 4100		< 6400	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	41900		38500		35400		51300	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	**139000**	*	**174000**		**243000**		**140000**	
Polychlorinated Biphenyls																
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	< 100		< 78		< 65		< 95	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	< 100		< 78		< 65		< 95	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	< 100		< 78		< 65		< 95	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	< 100		< 78		< 65		< 95	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	< 100		< 78		< 65		< 95	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	< 100		< 78		< 65		< 95	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	32	J	< 78		< 65		< 95	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	< 100		40	J	20	J	33	J
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	< 100		< 78		< 65		< 95	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	32		40		20		33	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM01		ND20-GM01		ND20-GM01		ND20-GM02	
								Sample ID	ND20-GM01-SURF_06/28/2020		ND20-GM01-0320_07/02/2020		ND20-GM01-2040_07/02/2020		ND20-GM02-SURF_07/01/2020	
								Parent Sample ID	--		--		--		--	
								Date	06-28-2020		07-02-2020		07-02-2020		07-01-2020	
								Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		0 - 0.3	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N	
Volatile Organic Compounds																
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-		-		-		< 15	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-		-		-		< 15	
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	UJ
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-		-		-		< 15	
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		7.7	J
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		370	J
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-		-		-		< 15	
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	UJ
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	UJ
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 77	
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-		-		-		< 15	
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	UJ
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		< 15	
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-		-		-		< 31	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM01		ND20-GM01		ND20-GM01		ND20-GM02	
								Sample ID	ND20-GM01-SURF_06/28/2020		ND20-GM01-0320_07/02/2020		ND20-GM01-2040_07/02/2020		ND20-GM02-SURF_07/01/2020	
								Parent Sample ID	--		--		--		--	
								Date	06-28-2020		07-02-2020		07-02-2020		07-01-2020	
								Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		0 - 0.3	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N	
Semi-Volatile Organic Compounds																
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 240		< 250		< 94	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 240		< 250		< 94	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 1100		< 1200		< 1300		< 460	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 11000		< 12000		< 13000		< 4600	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 240		< 250		< 94	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	**110**	**J**	**650**		**850**		**78**	**J**
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 1100		< 1200		< 1300		< 460	
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 5400		< 6000		< 6500		< 2400	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	UJ
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 5400		< 6000		< 6500		< 2400	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 5400		< 6000		< 6500		< 2400	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100	UJ	130	J	180	J	< 460	
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 5400		< 6000		< 6500		< 2400	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	**300**		**1200**		**990**		**150**	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	**86**	**J**	**350**		**250**	**J**	**44**	**J**
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 2400		< 2500		< 940	
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	**360**		**2600**		**1900**		**180**	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 2400		< 2500		< 940	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 2400		< 2500		57	J
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	**650**		**3800**		**2600**		**360**	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	**490**		**3200**		**2300**		**310**	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	**790**		**3600**		**2600**		**490**	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	**360**		**2100**		**1600**		**200**	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	**270**		**1300**		**810**		130	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	**390**	**J**	**1900**		**1500**		**240**	**J**
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	39	J	210	J	170	J	25	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200	UJ	< 1300	UJ	< 460	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 240		< 250		< 94	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	120	J	< 12000		< 13000		< 4600	
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 5400	UJ	< 6000		< 6500		< 2400	UJ
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	93	J	860		440		52	J
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	**920**		**4100**		**2800**		**480**	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	**97**	**J**	**470**		**400**		**45**	**J**
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	**250**	**J**	**860**	**J**	**690**	**J**	140	J
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	< 1100		< 1200		< 1300		< 460	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 1100		< 1200		< 1300		< 460	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 1100		< 1200		< 1300		< 460	
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 1100		< 1200		< 1300		< 460	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM01		ND20-GM01		ND20-GM01		ND20-GM02	
								Sample ID	ND20-GM01-SURF_06/28/2020		ND20-GM01-0320_07/02/2020		ND20-GM01-2040_07/02/2020		ND20-GM02-SURF_07/01/2020	
								Parent Sample ID	--		--		--		--	
								Date	06-28-2020		07-02-2020		07-02-2020		07-01-2020	
								Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		0 - 0.3	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N	
Semi-Volatile Organic Compounds (continued)																
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	**2400**		**9500**		**6800**		**1100**	**J**
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	**420**		**1400**		**1200**		**200**	**J**
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 240		< 250		< 94	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 240		< 250		< 94	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	UJ
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	**290**		**1700**		**1200**		170	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	150	J	**1100**		**1300**		100	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 2400		< 2500		< 940	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 210	UJ	< 240		< 250		< 94	
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	< 5400	UJ	< 6000	UJ	< 6500	UJ	< 2400	
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	**680**		**8200**		**6900**		**500**	
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 1100		< 1200		< 1300		< 460	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 5400		< 6000		< 6500		< 2400	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	**1900**		**7000**		**5300**		**900**	**J**
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**11000**		**54000**		**41000**		**5700**	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**11000**		**54000**		**41000**		**5700**	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**11000**		**54000**		**41000**		**5700**	
Dioxins/Furans																
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		4.9	J
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		0.88	J
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		0.04	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		0.022	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		0.056	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		0.11	J
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		0.022	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		0.054	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		< 0.021	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		< 0.021	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		0.0097	J
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		0.0092	J
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		0.0097	J
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		0.0017	J
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		0.0031	J
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		110	J
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		2.4	J
Organotins																
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 4.3	UJ	< 3.1	UJ	< 2.5	UJ	< 3.6	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		< 49		< 40		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 5.6		< 4		< 3.3		< 4.7	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	< 5		< 3.6		< 2.9		< 4.2	
Other																
Moisture	SM2540	--	--	--	--	--	--	%	220		140		90		180	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	96700		78100		39400		77700	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM02		ND20-GM02		ND20-GM02		ND20-GM02		ND20-GM02	
								Sample ID	ND20-GM02-0320_07/02/2020		ND20-GM02-2040_07/02/2020		ND20-GM02-4060_07/02/2020		ND20-GM02-6080_07/02/2020		ND20-GM02-8010_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0.3 - 2		2 - 4		4 - 6		6 - 8		8 - 10	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	13000000		11700000		11200000		9670000		4770000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	1200	J	720	J	< 9000		820	J	< 6900	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	7000		4900		5100		6500		3600	
Barium	SW6010	--	--	--	--	--	--	µg/kg	158000		93500		92200		102000		46300	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	670	J	550	J	550	J	550	J	250	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	990		850		890		**1100**		290	J
Calcium	SW6010	--	--	--	--	--	--	µg/kg	12800000		12900000		13700000		14300000		16500000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	32900		27200		26200		23700		11300	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	10500		8300		8200		7600	J	4000	J
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	**64500**		**53200**		**51500**		**68800**		26200	
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	**30300000**		**22400000**		**22000000**		**20500000**		9970000	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	**78800**		**61200**		**64200**		**345000**		23200	
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	9400000		8950000		9110000		8750000		6470000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	410000	*	304000	*	302000	*	244000	*	164000	*
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	**310**		< 180		**540**		**460**		52	J
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	**26400**		22300		21700		19900		10600	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	1680000		1530000		1460000		1270000		627000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	1400	J	910	J	850	J	1200	J	< 4000	
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	250	J	200	J	140	J	220	J	< 1100	
Sodium	SW6010	--	--	--	--	--	--	µg/kg	331000	J	300000	J	300000	J	297000	J	229000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 3800		< 3100		< 3700		< 4100		< 2900	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	41000		38400		37700		32400		22800	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	**209000**		**214000**		**222000**		**265000**		59300	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM02		ND20-GM02		ND20-GM02		ND20-GM02		ND20-GM02	
								Sample ID	ND20-GM02-0320_07/02/2020		ND20-GM02-2040_07/02/2020		ND20-GM02-4060_07/02/2020		ND20-GM02-6080_07/02/2020		ND20-GM02-8010_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0.3 - 2		2 - 4		4 - 6		6 - 8		8 - 10	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-		-		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-		-		-		-		-	
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-		-		-		-		-	
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-		-		-		-		-	
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-		-		-		-		-	
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM02		ND20-GM02		ND20-GM02		ND20-GM02		ND20-GM02	
								Sample ID	ND20-GM02-0320_07/02/2020		ND20-GM02-2040_07/02/2020		ND20-GM02-4060_07/02/2020		ND20-GM02-6080_07/02/2020		ND20-GM02-8010_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0.3 - 2		2 - 4		4 - 6		6 - 8		8 - 10	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 89		< 240		< 160		< 24	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 89		< 240		< 160		< 24	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 11000		< 4400		< 12000		< 7800		< 1200	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 89		< 240		< 160		< 24	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	**420**		**350**		**840**		**900**		**120**	
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 5400		< 2300		< 6200		< 4000		< 600	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 5400		< 2300		< 6200		< 4000		< 600	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 5400		< 2300		< 6200		< 4000		< 600	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	77	J	84	J	240	J	260	J	71	J
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 5400		< 2300		< 6200		< 4000		< 600	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	**570**		**320**		**1200**		**920**		**210**	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	**200**	J	**69**	J	**240**	J	**200**		**55**	
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 890		< 2400		< 1600		< 240	
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	**1000**		**520**		**1700**		**1300**		**370**	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 890		< 2400		< 1600		< 240	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 890		< 2400		< 1600		7.5	J
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	**1300**		**830**	J	**2300**		**2000**		**630**	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	**1000**		**600**	J	**1900**		**1700**		**560**	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	**1400**		**810**	J	**2200**		**1900**		**680**	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	**790**		**480**	J	**1300**		**1200**		**400**	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	**490**		**260**		**770**		**690**		160	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	**800**	J	**460**		**1300**		**1100**		**350**	
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	100	J	60	J	180	J	160	J	30	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 1100	UJ	< 440		< 1200	UJ	< 780	UJ	< 120	UJ
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 89		< 240		< 160		< 24	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 11000		< 4400		< 12000		< 7800		< 1200	
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 5400		< 2300	UJ	< 6200		< 4000		< 600	
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	180	J	110		360		260		98	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	**1800**		**970**	J	**2500**		**2100**		**640**	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	**220**		**120**		**320**		**330**		**94**	
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	**390**	J	**230**	J	**660**	J	**570**	J	100	J
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	**< 1100**		< 440		**< 1200**		**< 780**		< 120	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	**< 1100**		< 440		**< 1200**		**< 780**		< 120	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	**< 1100**		< 440	UJ	**< 1200**		**< 780**		< 120	

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Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM02		ND20-GM02		ND20-GM02		ND20-GM02		ND20-GM02	
								Sample ID	ND20-GM02-0320_07/02/2020		ND20-GM02-2040_07/02/2020		ND20-GM02-4060_07/02/2020		ND20-GM02-6080_07/02/2020		ND20-GM02-8010_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0.3 - 2		2 - 4		4 - 6		6 - 8		8 - 10	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	4500		2000	J	6500		5000		1500	
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	930		420		1500		1000		160	
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 89		< 240		< 160		< 24	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 89		< 240		< 160		< 24	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	630		370		1100		960		330	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	450		440		1300		1500		270	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 880		< 2400		< 1600		< 240	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 89	UJ	< 240		< 160		< 24	
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	< 5400	UJ	< 2300	UJ	< 6200	UJ	< 4000	UJ	< 600	UJ
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	3500		1900		7300		5400		1100	
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 1100		< 440		< 1200		< 780		< 120	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 5400		< 2300		< 6200		< 4000		< 600	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	3000		2000		4800		3900		1200	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	23000		13000		39000		32000		8800	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	23000		13000		39000		32000		8800	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	23000		13000		39000		32000		8800	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 2.8		< 2.3		< 2.4		< 2.4		< 1.9	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	< 45		-		< 37		< 39		< 29	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 3.7		< 3		< 3.1		< 3.2		< 2.4	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	< 3.3		< 2.6		< 2.7		< 2.8		< 2.1	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	110		77		82		89		42	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	90300		33800		49200		53000		9370	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM03		ND20-GM03		ND20-GM03		ND20-GM03		ND20-GM03	
								Sample ID	ND20-GM03-SURF_06/28/2020		ND20-GM03-0320_07/02/2020		ND20-GM03-2040_07/02/2020		ND20-GM03-4060_07/02/2020		ND20-GM03-6080_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	06-28-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		4 - 6		6 - 8	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	15500000		8800000		12800000		8300000		10000000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	< 12200		< 8200		700	J	730	J	760	J
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	5800		4900		5200		4600		5900	
Barium	SW6010	--	--	--	--	--	--	µg/kg	163000	*	100000		107000		72500		95200	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	570	J	430	J	580	J	450	J	530	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	520	J	580	J	950		1300		1100	
Calcium	SW6010	--	--	--	--	--	--	µg/kg	10600000	*	10000000		14900000		16900000		13500000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	34000	J	21200		31000		21300		24500	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	11300		7100		9400		7100		7600	
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	70000		45800	*	76500	*	48600	*	78500	*
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	30800000		18200000		24600000		18900000		21600000	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	24600		57800	J	66800	J	69600	J	131000	J
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	9590000	*	6760000		10600000		9280000		8940000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	822000		285000		360000		279000		267000	
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	< 270		< 150		< 190		340		260	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	27800	J	18300		25000		18400		19700	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	1980000		1090000		1610000		1060000		1270000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	1400	J	< 4800		980	J	< 3700		1000	J
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	220	J	140	J	330	J	150	J	150	J
Sodium	SW6010	--	--	--	--	--	--	µg/kg	322000	J	248000	J	302000	J	256000	J	269000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 5100		< 3400		< 3600		< 2600		< 3400	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	42800		31600		39600		32500		33000	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	117000	*	131000		216000		191000		271000	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM03		ND20-GM03		ND20-GM03		ND20-GM03		ND20-GM03	
								Sample ID	ND20-GM03-SURF_06/28/2020		ND20-GM03-0320_07/02/2020		ND20-GM03-2040_07/02/2020		ND20-GM03-4060_07/02/2020		ND20-GM03-6080_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	06-28-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		4 - 6		6 - 8	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-		-		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-		-		-		-		-	
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-		-		-		-		-	
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-		-		-		-		-	
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-		-		-		-		-	
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-		-		-		-		-	

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Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM03		ND20-GM03		ND20-GM03		ND20-GM03		ND20-GM03	
								Sample ID	ND20-GM03-SURF_06/28/2020		ND20-GM03-0320_07/02/2020		ND20-GM03-2040_07/02/2020		ND20-GM03-4060_07/02/2020		ND20-GM03-6080_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	06-28-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		4 - 6		6 - 8	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 92		< 150		< 250		< 100		< 230	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 92		< 150		< 250		< 100		< 230	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 4500		< 7500		< 12000		< 5000		< 11000	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 92		< 150		< 250		< 100		< 230	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	77	J	270		540		390		1500	
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 450		< 750		< 1200		< 500		41	J
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 2300		< 3900		< 6300		< 2600		< 5800	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 2300		< 3900		< 6300		< 2600		< 5800	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 2300		< 3900		< 6300		< 2600		< 5800	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	22	J	730	J	99	J	120	J	180	J
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 2300		< 3900		< 6300		< 2600		< 5800	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	93		560		750		450		1400	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	62	J	140	J	150	J	260		230	J
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 920		< 1500		< 2500		< 1000		< 2300	
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	210		1400		1500		930		1900	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 920		< 1500		< 2500		< 1000		< 2300	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	31	J	< 1500		< 2500		< 1000		< 2300	
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	540		2600		2500		1700		4100	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	470		2100		2100		1300		3300	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	550		2600		3400		1500		3400	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	320		1300		1300		780		2100	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	190		850		920		520		1300	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	300	J	1300		1300		780		2100	
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	24	J	74	J	130	J	71	J	230	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750	UJ	< 1200		< 500		< 1100	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 92		< 150		< 250		< 100		< 230	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 4500		130	J	< 12000		< 5000		< 11000	
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 2300		< 3900		< 6300		< 2600		< 5800	
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	57	J	460		490		150		760	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	540		2700		2500		1600		4200	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	160		410		510		300		710	
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	92	J	400	J	500	J	350	J	810	J
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM03		ND20-GM03		ND20-GM03		ND20-GM03		ND20-GM03	
								Sample ID	ND20-GM03-SURF_06/28/2020		ND20-GM03-0320_07/02/2020		ND20-GM03-2040_07/02/2020		ND20-GM03-4060_07/02/2020		ND20-GM03-6080_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	06-28-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		4 - 6		6 - 8	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	1200		6100		6100		3900		10000	
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	140		700		920		780		1400	
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 92		< 150		< 250		< 100		< 230	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 92		< 150		< 250		< 100		< 230	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	290		1200		1100		720		1800	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	120		640		950		600		2000	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 910		< 1500		< 2500		< 1000		< 2300	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 92		< 150		< 250		< 100		< 230	
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	< 2300		< 3900	UJ	< 6300		< 2600		< 5800	
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	600		4600		6100		4100		13000	
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 450		< 750		< 1200		< 500		< 1100	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 2300		< 3900		< 6300		< 2600		< 5800	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	1000		4400		5600		3300		10000	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	6900		34000		38000		24000		64000	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	6900		34000		38000		24000		64000	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	6900		34000		38000		24000		64000	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	-		-		-		-		-	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	170		72		85		52		64	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	71700		48500		42800		28900		59000	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM03		ND20-GM04		ND20-GM04		ND20-GM04		ND20-GM04	
								Sample ID	ND20-GM03-8010_07/02/2020		ND20-GM04-SURF_06/30/2020		ND20-GM04-0320_06/29/2020		ND20-GM04-2040_06/29/2020		ND20-GM04-4060_06/29/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		06-30-2020		06-29-2020		06-29-2020		06-29-2020	
								Sample Depth (ft bss)	8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**N**		**N**	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	7360000		19100000		10700000		11600000		7600000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	520	J	< 16200		< 7500		< 9600		< 8500	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	5000		6700		5000		4800		5600	
Barium	SW6010	--	--	--	--	--	--	µg/kg	99400		183000		107000		117000		86400	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	400	J	790	J	470	J	530	J	480	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	860		660	J	540	J	670	J	910	
Calcium	SW6010	--	--	--	--	--	--	µg/kg	16000000		11900000		12200000		14500000		13300000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	17500		41500		24600		26200		19600	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	6700		12800	J	8100		8300		6600	J
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	**106000**	*	**47800**		**43600**		**45400**		**58400**	
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	16400000		**36000000**		**20700000**		**22600000**		16600000	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	**155000**	J	29100		**45000**		**68400**		**103000**	
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	7970000		11000000		8260000		8030000		7290000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	216000		**1060000**	*	355000	*	408000	*	205000	*
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	< 150		< 260		49	J	**270**		**200**	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	17600		**32100**		20600		21300		17000	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	936000		2620000		1310000		1400000		988000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	850	J	2100	J	1200	J	< 5600		1200	J
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	110	J	< 2700		< 1300		< 1600		< 1400	
Sodium	SW6010	--	--	--	--	--	--	µg/kg	246000	J	396000	J	301000	J	299000	J	254000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 2700		< 6700		< 3100		< 4000		< 3500	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	33200		51900		35400		35600		28500	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	**183000**		**135000**		**136000**		**157000**		**254000**	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	-		< 96		-		-		-	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	-		< 96		-		-		-	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	-		< 96		-		-		-	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	-		< 96		-		-		-	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	-		< 96		-		-		-	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	-		21	J	-		-		-	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	-		< 96		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	-		< 96		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	-		< 96		-		-		-	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	-		21		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM03		ND20-GM04		ND20-GM04		ND20-GM04		ND20-GM04	
								Sample ID	ND20-GM03-8010_07/02/2020		ND20-GM04-SURF_06/30/2020		ND20-GM04-0320_06/29/2020		ND20-GM04-2040_06/29/2020		ND20-GM04-4060_06/29/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		06-30-2020		06-29-2020		06-29-2020		06-29-2020	
								Sample Depth (ft bss)	8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**N**		**N**	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-		< 15		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-		< 15		-		-		-	
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15	UJ	-		-		-	
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-		< 15		-		-		-	
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-		330	J	-		-		-	
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-		< 15		-		-		-	
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15	UJ	-		-		-	
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15	UJ	-		-		-	
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-		< 73		-		-		-	
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-		< 15		-		-		-	
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-		< 15	UJ	-		-		-	
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		< 15		-		-		-	
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-		< 29		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM03		ND20-GM04		ND20-GM04		ND20-GM04		ND20-GM04	
								Sample ID	ND20-GM03-8010_07/02/2020		ND20-GM04-SURF_06/30/2020		ND20-GM04-0320_06/29/2020		ND20-GM04-2040_06/29/2020		ND20-GM04-4060_06/29/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		06-30-2020		06-29-2020		06-29-2020		06-29-2020	
								Sample Depth (ft bss)	8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 200		< 76		< 59		< 91		< 120	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 200		< 76		< 59		< 91		< 120	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 9800		< 3800		< 2900		< 4500		< 6100	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 200		< 76		< 59		< 91		< 120	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	410		68	J	170		210		750	
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 5100		< 1900		< 1500		< 2300		< 3200	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 5100		< 1900		< 1500		< 2300		< 3200	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 5100		< 1900		< 1500		< 2300		< 3200	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	87	J	38	J	69	J	81	J	150	J
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 5100		< 1900		< 1500		< 2300		< 3200	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	550		110		290		590		910	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	170	J	73	J	85		120		690	
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 2000		< 760		17	J	< 910		< 1200	
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	860		250		470		1200		1900	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 2000		< 760		< 590		< 910		< 1200	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	< 2000		37	J	52	J	45	J	< 1200	
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	1800		520		1000		2800		3300	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	1500		490		830		2200		2600	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	1800		570		1000		2400		2900	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	920		390		560		1400		1500	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	500		270		340		910		990	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	890	J	330	J	520		1300		1500	
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	82	J	28	J	43	J	57	J	130	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 200		< 76		< 59		< 91		< 120	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 9800		49	J	< 2900		< 4500		< 6100	
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 5100		< 1900	UJ	< 1500		< 2300		< 3200	
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	370		71	J	140		430		310	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	1700		590		1000		2800		3000	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	390		110		170		410		550	
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	370	J	94	J	180	J	250	J	480	J
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 980		< 380		< 290		< 450		< 610	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM03		ND20-GM04		ND20-GM04		ND20-GM04		ND20-GM04	
								Sample ID	ND20-GM03-8010_07/02/2020		ND20-GM04-SURF_06/30/2020		ND20-GM04-0320_06/29/2020		ND20-GM04-2040_06/29/2020		ND20-GM04-4060_06/29/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		06-30-2020		06-29-2020		06-29-2020		06-29-2020	
								Sample Depth (ft bss)	8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	4500		1300		2500		7600		7300	
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	550		170		380		650		910	
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 200		< 76		< 59		< 91		< 120	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 200		< 76		< 59		< 91		< 120	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	880		320		500		1300		1400	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	940		86		280		290		1100	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 2000		< 760		< 590		< 910		< 1200	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 200		< 76		< 59		< 91		< 120	
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	< 5100		< 1900		< 1500	UJ	< 2300	UJ	< 3200	UJ
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	4400		670		1900		5800		6800	
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 980		< 380		< 290		< 450		< 610	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 5100		< 1900		< 1500		< 2300		< 3200	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	4000		900		2100		6700		5700	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	27000		7200		14000		39000		44000	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	27000		7200		14000		39000		44000	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	27000		7200		14000		39000		44000	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		1.2		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		0.45		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		0.011		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		0.00691	J	-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		0.016		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		0.03		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		0.017	J	-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		0.018		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		0.0011	J	-		-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		0.0035	J	-		-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		0.0028	J	-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		0.0031	J	-		-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		0.0031	J	-		-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		0.001	J	-		-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		0.002		-		-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		24	J	-		-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		0.75		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		< 3.7		-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		< 59		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		< 4.8		-		-		-	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	-		< 4.3		-		-		-	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	54		190		77		81		48	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	43000		65000		51300		54900		56500	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM04		ND20-GM04		ND20-GM05		ND20-GM05		ND20-GM05	
								Sample ID	ND20-GM04-6080_06/29/2020		ND20-GM04-8010_06/29/2020		ND20-GM05-SURF_06/28/2020		ND20-GM05-0320_07/02/2020		ND20-GM05-2040_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	06-29-2020		06-29-2020		06-28-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	4610000		4160000		18000000		13100000		12100000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	< 5900		< 6300		900	J	< 10500		< 8600	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	3200		2100		5700		5400		5800	
Barium	SW6010	--	--	--	--	--	--	µg/kg	26000		24000		159000	*	130000		140000	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	240	J	210	J	650	J	550	J	530	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	200	J	150	J	540	J	520	J	580	J
Calcium	SW6010	--	--	--	--	--	--	µg/kg	9160000		16800000		10600000	*	13800000		13500000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	10600		9500		38500	J	30000		28900	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	3900	J	3500	J	12800		9700		9200	
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	27900		7800		35600		34000	*	39700	*
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	11700000		9960000		34900000		25400000		24400000	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	20300		2800		21900		23000	J	37200	J
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	3960000		5950000		10400000	*	9880000		9440000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	141000	*	158000	*	1130000		592000		484000	
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	< 110		< 120		< 250		< 210		< 170	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	10300		9800		31400	J	24200		23200	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	477000	J	510000	J	2290000		1690000		1560000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	< 3400		< 3700		1400	J	< 6100		1000	J
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	< 980		< 1000		< 1800		< 1800		< 1400	
Sodium	SW6010	--	--	--	--	--	--	µg/kg	221000	J	216000	J	350000	J	314000	J	316000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 2400		< 2600		< 4600		< 4400		< 3600	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	23200		24000		48200		39500		39400	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	44600		16900		121000	*	118000		136000	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 87		< 71		< 65	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 87		< 71		< 65	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 87		< 71		< 65	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 87		< 71		< 65	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 87		< 71		500	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 87		< 71		< 65	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	-		-		15	J	16	J	150	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 87		< 71		< 65	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 87		< 71		< 65	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	-		-		15		16		650	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM04		ND20-GM04		ND20-GM05		ND20-GM05		ND20-GM05	
								Sample ID	ND20-GM04-6080_06/29/2020		ND20-GM04-8010_06/29/2020		ND20-GM05-SURF_06/28/2020		ND20-GM05-0320_07/02/2020		ND20-GM05-2040_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	06-29-2020		06-29-2020		06-28-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**N**		**N**	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-		-		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-		-		-		-		-	
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-		-		-		-		-	
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-		-		-		-		-	
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-		-		-		-		-	
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM04		ND20-GM04		ND20-GM05		ND20-GM05		ND20-GM05	
								Sample ID	ND20-GM04-6080_06/29/2020		ND20-GM04-8010_06/29/2020		ND20-GM05-SURF_06/28/2020		ND20-GM05-0320_07/02/2020		ND20-GM05-2040_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	06-29-2020		06-29-2020		06-28-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 44		< 4.1		< 90		< 78		< 65	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 44		< 4.1		< 90		< 78		< 65	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 2200		< 200		< 4500		< 3800		< 3200	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 44		< 4.1		< 90		< 78		< 65	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	**190**		0.35	J	**130**		**62**	**J**	**87**	
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	8.1	J	< 20		< 450		< 380		< 320	
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 100		< 2300		< 2000		< 1700	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 100		< 2300		< 2000		< 1700	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 100		< 2300		< 2000		< 1700	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	66	J	< 20		25	J	16	J	23	J
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 100		< 2300		< 2000		< 1700	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	**220**		1.1	J	**150**		**92**		**160**	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	**93**		< 4.1		**53**	**J**	**39**	**J**	**49**	**J**
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 440		< 41		< 900		< 780		< 650	
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	**430**		< 4.1		**270**		**150**		**240**	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 440		< 41		< 900		< 780		< 650	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	< 440		< 41		< 900		72	J	58	J
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	**740**		< 4.1		**530**		**300**		**470**	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	**630**		< 4.1		**470**		**220**		**370**	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	**630**		< 4.1		**530**		**300**		**480**	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	**400**		< 4.1		**320**		160		**240**	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	220		< 4.1		170		110		180	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	**360**		< 20		**290**	**J**	**160**	**J**	**250**	**J**
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	43	J	< 20		34	J	18	J	28	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 44		< 4.1		< 90		< 78		< 65	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 2200		< 200		< 4500		< 3800		94	J
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		80	J	< 380		< 320	
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 100		< 2300		< 2000		< 1700	
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	150		< 4.1		82	J	32	J	80	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	**660**		< 4.1		**530**		**330**		**590**	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	**130**		< 4.1		**150**		**110**		**110**	
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	**160**	**J**	0.16	J	110	J	79	J	130	J
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 220		1.6	J	< 450		< 380		< 320	
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 220		< 20		< 450		< 380		< 320	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM04		ND20-GM04		ND20-GM05		ND20-GM05		ND20-GM05	
								Sample ID	ND20-GM04-6080_06/29/2020		ND20-GM04-8010_06/29/2020		ND20-GM05-SURF_06/28/2020		ND20-GM05-0320_07/02/2020		ND20-GM05-2040_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	06-29-2020		06-29-2020		06-28-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**N**		**N**	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	**1700**		0.65	J	**1200**		**740**		**1400**	
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	**240**		< 4.1		**180**		**140**		**250**	
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 44		< 4.1		< 90		< 78		< 65	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 44		< 4.1		< 90		< 78		< 65	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	**360**		< 4.1		**300**		150		**230**	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	**390**		< 4.1		**230**		96		160	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 440		< 41		< 900		< 770		< 650	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 44		< 4.1		< 90		< 78		< 65	
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	**< 1100**	**UJ**	< 100	UJ	**< 2300**		**< 2000**		**< 1700**	
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	**1900**		0.9	J	**1000**		**460**		**1000**	
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 220		< 20		< 450		< 380		< 320	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1100		< 100		< 2300		< 2000		< 1700	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	**1600**		0.71	J	**1100**		**630**		**1200**	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**11000**		4		**7600**		**4200**		**7500**	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**11000**		14		**7600**		**4200**		**7500**	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**11000**		39		**7600**		**4200**		**7500**	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		< 3.4	UJ	< 2.9		< 2.6	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		-		< 54		< 46		< 42	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		< 4.5		< 3.7		< 3.4	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	-		-		**< 3.9**		**< 3.3**		**< 3**	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	33		21		170		120		99	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	12300		< 1000		46300		47000		56600	

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Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM05		ND20-GM05		ND20-GM06		ND20-GM06		ND20-GM06	
								Sample ID	ND20-GM05-4060_07/02/2020		ND20-GM05-6080_07/02/2020		ND20-GM06-SURF_06/28/2020		ND20-GM06-0320_07/02/2020		ND20-GM06-2040_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	4 - 6		6 - 8		0 - 0.3		0.3 - 2		2 - 4	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	N		N		N		N		N	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	3450000		5310000		12700000		10200000		9640000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	< 6200		< 6000		< 9500		< 11600		< 8400	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	2100		2700		4700		5300		4800	
Barium	SW6010	--	--	--	--	--	--	µg/kg	21000		37700		125000	*	118000		91500	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	160	J	250	J	460	J	460	J	470	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	150	J	190	J	430	J	520	J	800	
Calcium	SW6010	--	--	--	--	--	--	µg/kg	18200000		32800000		9850000	*	12300000		13600000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	8800		11700		28000	J	25200		23700	J
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	3100	J	4700	J	9400		8000	J	7700	
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	6300	*	10000	*	**38600**		**34900**	*	**53800**	*
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	8440000		11300000		**24800000**		**20900000**		**20200000**	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	2300	J	3400	J	20000		29400	J	**162000**	J
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	6680000		12900000		8340000	*	8250000		8580000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	198000		318000		**508000**		344000		292000	
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	< 120		< 120		< 220		< 180		**220**	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	9000		12300		**23100**	J	20200		20400	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	442000	J	774000		1590000		1320000		1200000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	< 3600		< 3500		1200	J	< 6700		< 4900	
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	< 1000		< 1000		< 1600		< 1900		200	J
Sodium	SW6010	--	--	--	--	--	--	µg/kg	169000	J	247000	J	288000	J	287000	J	298000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 2600		< 2500		< 4000		< 4800		< 3500	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	20000		24500		36700		35900		35400	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	15300		21800		97000	*	116000		**196000**	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	< 40		< 43		-		-		-	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	< 40		< 43		-		-		-	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	< 40		< 43		-		-		-	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	< 40		< 43		-		-		-	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	< 40		< 43		-		-		-	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	< 40		< 43		-		-		-	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	< 40		< 43		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	< 40		< 43		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	< 40		< 43		-		-		-	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	0		0		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM05	ND20-GM05	ND20-GM06	ND20-GM06	ND20-GM06
								Sample ID	ND20-GM05-4060_07/02/2020	ND20-GM05-6080_07/02/2020	ND20-GM06-SURF_06/28/2020	ND20-GM06-0320_07/02/2020	ND20-GM06-2040_07/02/2020
								Parent Sample ID	--	--	--	--	--
								Date	07-02-2020	07-02-2020	06-28-2020	07-02-2020	07-02-2020
								Sample Depth (ft bss)	4 - 6	6 - 8	0 - 0.3	0.3 - 2	2 - 4
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**	**N**	**N**	**N**	**N**
Volatile Organic Compounds													
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-	-	-	-	-
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-	-	-	-	-
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-	-	-	-	-
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-	-	-	-	-
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-	-	-	-	-

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM05		ND20-GM05		ND20-GM06		ND20-GM06		ND20-GM06	
								Sample ID	ND20-GM05-4060_07/02/2020		ND20-GM05-6080_07/02/2020		ND20-GM06-SURF_06/28/2020		ND20-GM06-0320_07/02/2020		ND20-GM06-2040_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	4 - 6		6 - 8		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 210		< 3800		< 3500		< 11000	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	0.3	J	< 4.4		**46**	**J**	**77**		**600**	
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 110		< 110		< 2000		< 1800		< 5600	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 110		< 110		< 2000		< 1800		< 5600	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 110		< 110		< 2000		< 1800		< 5600	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 21		0.79	J	14	J	44	J	140	J
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 110		< 110		< 2000		< 1800		< 5600	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	0.59	J	< 4.4		**56**	**J**	**130**		**1100**	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	< 4.3		< 4.4		**35**	**J**	**48**	**J**	**200**	**J**
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 43		< 44		< 770		< 710		< 2200	
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	0.66	J	< 4.4		**110**		**210**		**2100**	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 43		< 44		< 770		< 710		< 2200	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	< 43		1	J	35	J	52	J	< 2200	
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	1.4	J	< 4.4		**250**		**370**		**4300**	**J**
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	1	J	< 4.4		**200**		**280**		**3500**	**J**
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	1.4	J	< 4.4		**250**		**350**		**3900**	**J**
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	< 4.3		< 4.4		150		**190**		**2000**	**J**
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	0.17	J	< 4.4		100		150		**1400**	**J**
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	0.69	J	< 21		140	J	**190**	**J**	**2100**	
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		15	J	21	J	130	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	2.2	J	< 210		< 3800		< 3500		< 11000	
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	1.6	J	< 21		< 380		< 350		< 1100	
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 110		33	J	< 2000		< 1800		< 5600	
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	< 4.3		< 4.4		25	J	40	J	760	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	1.4	J	< 4.4		**270**		**420**		**4700**	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	< 4.3		< 4.4		**100**		**110**		**680**	
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	0.28	J	< 21		59	J	100	J	**610**	**J**
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	< 21		0.72	J	< 380		< 350		**< 1100**	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 21		< 21		< 380		< 350		**< 1100**	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	0.94	J	1.2	J	< 380		< 350		< 1100	
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 21		< 21		< 380		< 350		**< 1100**	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM05		ND20-GM05		ND20-GM06		ND20-GM06		ND20-GM06	
								Sample ID	ND20-GM05-4060_07/02/2020		ND20-GM05-6080_07/02/2020		ND20-GM06-SURF_06/28/2020		ND20-GM06-0320_07/02/2020		ND20-GM06-2040_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	4 - 6		6 - 8		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	2.5	J	0.45	J	600		990		9800	J
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	0.63	J	< 4.4		89		200		1300	
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	< 4.3		< 4.4		130		170		1900	J
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	< 4.3		< 4.4		73	J	190		880	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 42		< 43		< 770		< 710		< 2200	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220	
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	< 110		< 110		< 2000		< 1800		< 5600	
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	2.7	J	0.65	J	270		580		11000	J
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 21		< 21		< 380		< 350		< 1100	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 110		< 110		< 2000		< 1800		< 5600	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	2.4	J	< 4.4		500		820		9800	J
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	16		1		3400		5500		61000	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	20		13		3400		5500		61000	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	27		45		3400		5500		61000	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 1.6		< 1.8		-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	< 26		< 28		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 2.1		< 2.3		-		-		-	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	< 1.9		< 2		-		-		-	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	23		32		130		98		67	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	7880		< 1000		67200		49400		32900	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM06		ND20-GM06		ND20-GM06		ND20-GM07		ND20-GM07	
								Sample ID	ND20-GM06-4060_07/02/2020		ND20-GM06-6080_07/02/2020		ND20-GM06-8010_07/02/2020		ND20-GM07-SURF_06/28/2020		ND20-GM07-0320_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		06-28-2020		07-02-2020	
								Sample Depth (ft bss)	4 - 6		6 - 8		8 - 10		0 - 0.3		0.3 - 2	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**N**		**N**	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	7260000		7950000		9180000		11900000		10600000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	680	J	740	J	1100	J	< 10400		< 10000	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	4800		5200		6000		4500		5100	
Barium	SW6010	--	--	--	--	--	--	µg/kg	65300		83300		260000		138000	*	101000	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	380	J	450	J	500	J	430	J	490	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	630	J	910		**1200**		420	J	540	J
Calcium	SW6010	--	--	--	--	--	--	µg/kg	18300000		15000000		14500000		11500000	*	15200000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	18900		20700		23500		26200	J	24400	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	6600	J	6800	J	7600		8500	J	7900	J
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	**36900**	*	**44500**	*	**52200**	*	**33600**		**36800**	
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	17200000		19400000		**22000000**		**23800000**		**21900000**	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	**63700**	J	**114000**	J	**159000**	J	17600		30500	*
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	9200000		7870000		8210000		8410000	*	8990000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	282000		259000		285000		**603000**		396000	
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	**230**		**270**		**350**		57	J	91	J
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	17800		17800		19600		21700	J	20400	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	943000		1010000		1180000		1510000		1330000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	< 4900		< 5500		750	J	< 6100		< 5800	
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	< 1400		150	J	200	J	< 1700		< 1700	
Sodium	SW6010	--	--	--	--	--	--	µg/kg	299000	J	369000	J	485000	J	277000	J	317000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 3500		< 3900		< 3200		< 4300		< 3300	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	30500		30900		34200		34500		37000	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	**162000**		**215000**		**286000**		91200	*	**125000**	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM06		ND20-GM06		ND20-GM06		ND20-GM07		ND20-GM07	
								Sample ID	ND20-GM06-4060_07/02/2020		ND20-GM06-6080_07/02/2020		ND20-GM06-8010_07/02/2020		ND20-GM07-SURF_06/28/2020		ND20-GM07-0320_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		06-28-2020		07-02-2020	
								Sample Depth (ft bss)	4 - 6		6 - 8		8 - 10		0 - 0.3		0.3 - 2	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**N**		**N**	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-		-		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-		-		-		-		-	
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-		-		-		-		-	
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-		-		-		-		-	
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-		-		-		-		-	
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM06		ND20-GM06		ND20-GM06		ND20-GM07		ND20-GM07	
								Sample ID	ND20-GM06-4060_07/02/2020		ND20-GM06-6080_07/02/2020		ND20-GM06-8010_07/02/2020		ND20-GM07-SURF_06/28/2020		ND20-GM07-0320_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		06-28-2020		07-02-2020	
								Sample Depth (ft bss)	4 - 6		6 - 8		8 - 10		0 - 0.3		0.3 - 2	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 48		< 140		< 140		< 79		< 110	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 48		< 140		< 140		< 79		< 110	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 2300		< 6700		< 6800		< 3900		< 5400	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 48		< 140		< 140		< 79		< 110	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	270		970		730		52	J	160	
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1200		< 3500		< 3500		< 2000		< 2800	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1200		< 3500		< 3500		< 2000		< 2800	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1200		< 3500		< 3500		< 2000		< 2800	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	83	J	200	J	270	J	< 390		49	J
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1200		< 3500		< 3500		< 2000		< 2800	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	360		1100		360		110		330	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	72		350		160		47	J	56	J
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 480		< 1400		< 1400		< 790		< 1100	
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	770		1700		910		160		420	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 480		< 1400		< 1400		< 790		< 1100	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	< 480	UJ	< 1400	UJ	< 1400	UJ	32	J	62	J
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	1100		2800		1500		300		660	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	800		2300		1100		220		470	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	880		2400		1200		320		680	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	550		1600		820		140		350	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	360		900		550		110		260	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	510		1400		760		160	J	350	J
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	55	J	180	J	110	J	18	J	41	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 48		< 140		< 140		< 79		< 110	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 2300		< 6700		< 6800		< 3900		120	J
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		6.2	J
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 1200		< 3500		< 3500		< 2000		< 2800	UJ
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	140		590		190		39	J	120	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	1000		2600		1500		350		800	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	180		500		340		100		100	J
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	300		920		350	J	96	J	220	J
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 230		< 670		< 680		< 390		< 540	UJ

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM06		ND20-GM06		ND20-GM06		ND20-GM07		ND20-GM07	
								Sample ID	ND20-GM06-4060_07/02/2020		ND20-GM06-6080_07/02/2020		ND20-GM06-8010_07/02/2020		ND20-GM07-SURF_06/28/2020		ND20-GM07-0320_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		06-28-2020		07-02-2020	
								Sample Depth (ft bss)	4 - 6		6 - 8		8 - 10		0 - 0.3		0.3 - 2	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	**4000**		**8100**		**3700**		**850**		**1900**	
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	**540**		**1500**		**520**		**160**		**490**	
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 48		< 140		< 140		< 79		< 110	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 48		< 140		< 140		< 79		< 110	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	**470**		**1400**		**700**		130		**310**	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	**410**		**1800**		**1100**		81		**340**	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 470		< 1400		< 1400		< 790		< 1100	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 48		< 140		< 140		< 79		< 110	UJ
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	< 1200	UJ	< 3500	UJ	< 3500	UJ	< 2000		< 2800	UJ
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	**4100**		**9300**		**3000**		**480**		**1800**	
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 230		< 670		< 680		< 390		< 540	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1200		< 3500		< 3500		< 2000		< 2800	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	**3000**		**6500**		**3000**		**680**		**1700**	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**19000**		**47000**		**22000**		**4500**		**11000**	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**19000**		**47000**		**22000**		**4500**		**11000**	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**19000**		**47000**		**22000**		**4500**		**11000**	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-		< 3.1	UJ	< 2.4	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-		< 49		< 38	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-		< 4		< 3.1	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	-		-		-		**< 3.5**		**2.9**	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	55		61		76		140		78	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	31600		70000		62300		91300		40700	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM07		ND20-GM07		ND20-GM07		ND20-GM07		ND20-GM08	
								Sample ID	ND20-GM07-2040_07/02/2020		ND20-GM07-4060_07/02/2020		ND20-GM07-6080_07/02/2020		ND20-GM07-8010_07/02/2020		ND20-GM08-SURF_06/29/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		07-02-2020		06-29-2020	
								Sample Depth (ft bss)	2 - 4		4 - 6		6 - 8		8 - 10		0 - 0.3	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	9040000		6040000		4760000		3890000		11200000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	< 8700		< 7000		< 5100		< 5700		< 9000	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	4900		3600		2800		2600		4600	
Barium	SW6010	--	--	--	--	--	--	µg/kg	80300		73700		34600		21400		102000	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	510	J	370	J	230	J	200	J	490	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	740		520	J	180	J	140	J	430	J
Calcium	SW6010	--	--	--	--	--	--	µg/kg	20800000		18500000		25100000		12500000		12100000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	22000		15000		11000		9900		24700	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	7400		5400	J	4400		3700	J	8200	
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	**47800**		**36200**		10100		7000		31000	
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	19000000		13600000		10400000		11400000		**20800000**	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	**51500**	*	**56100**	*	3300	*	2700	*	16800	
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	10700000		8500000		9760000		4630000		8480000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	277000		224000		268000		176000		**463000**	*
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	**210**		160		< 120		< 120		56	J
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	19600		14200		11500		9700		20200	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	1190000		866000		678000		394000	J	1460000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	< 5100		< 4100		< 3000		< 3300		950	J
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	< 1500		< 1200		< 850		< 950		< 1500	
Sodium	SW6010	--	--	--	--	--	--	µg/kg	312000	J	268000	J	231000	J	214000	J	306000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 3200		< 2600		< 2200		< 2900		< 3800	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	35700		28000		24500		29200		35900	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	**192000**		**144000**		19300		16600		95100	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM07		ND20-GM07		ND20-GM07		ND20-GM07		ND20-GM08	
								Sample ID	ND20-GM07-2040_07/02/2020		ND20-GM07-4060_07/02/2020		ND20-GM07-6080_07/02/2020		ND20-GM07-8010_07/02/2020		ND20-GM08-SURF_06/29/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		07-02-2020		06-29-2020	
								Sample Depth (ft bss)	2 - 4		4 - 6		6 - 8		8 - 10		0 - 0.3	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-		-		-		-		< 11	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-		-		-		-		< 11	
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	UJ
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-		-		-		-		< 11	
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		84	J
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-		-		-		-		< 11	
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	UJ
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	UJ
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 57	
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-		-		-		-		< 11	
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	UJ
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		< 11	
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-		-		-		-		< 23	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM07		ND20-GM07		ND20-GM07		ND20-GM07		ND20-GM08	
								Sample ID	ND20-GM07-2040_07/02/2020		ND20-GM07-4060_07/02/2020		ND20-GM07-6080_07/02/2020		ND20-GM07-8010_07/02/2020		ND20-GM08-SURF_06/29/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		07-02-2020		06-29-2020	
								Sample Depth (ft bss)	2 - 4		4 - 6		6 - 8		8 - 10		0 - 0.3	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 80		< 180		< 4.3		< 4.4		< 33	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 80		< 180		< 4.3		< 4.4		< 33	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 400		76	J	< 21		< 22		11	J
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 4000		< 9000		< 210		< 220		< 1600	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 80		< 180		< 4.3		< 4.4		< 33	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	**300**		**3800**		0.29	J	< 4.4		**74**	
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 400		< 900		< 21		< 22		4.7	J
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 2000		< 4600		< 110		< 110		< 830	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 2000		< 4600		< 110		< 110		< 830	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 2000		< 4600		< 110		< 110		< 830	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	99	J	160	J	< 21		< 22		22	J
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 2000		< 4600		< 110		< 110		< 830	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	**340**		**4300**		< 4.3		< 4.4		**45**	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	**77**	**J**	**440**		< 4.3		< 4.4		**26**	**J**
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 800		< 1800		< 43		< 44		8.2	J
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	**590**		**5900**		0.46	J	< 4.4		**87**	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 800		< 1800		< 43		< 44		< 330	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	< 800		< 1800		< 43		< 44		30	J
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	**900**		**9400**		< 4.3		< 4.4		**200**	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	**590**		**8000**		< 4.3		< 4.4		**170**	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	**880**		**8600**		< 4.3		< 4.4		230	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	**480**		**5200**		< 4.3		< 4.4		120	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	**290**		**2100**		< 4.3		< 4.4		84	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	**470**		**4600**		< 21		< 22		120	J
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	55	J	610	J	< 21		< 22		16	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 80		< 180		< 4.3		< 4.4		< 33	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 4000		< 9000		< 210		< 220		< 1600	
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 2000	UJ	< 4600	UJ	< 110	UJ	< 110	UJ	< 830	
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	100		2200		< 4.3		< 4.4		28	J
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	**1100**		**9600**		< 4.3		< 4.4		**230**	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	**140**		**1300**		< 4.3		< 4.4		**56**	
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	**220**	**J**	**2000**		0.24	J	< 22		54	J
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 400		< 900		0.9	J	0.98	J	< 160	
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 400	UJ	< 900	**UJ**	< 21	UJ	< 22	UJ	< 160	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM07		ND20-GM07		ND20-GM07		ND20-GM07		ND20-GM08	
								Sample ID	ND20-GM07-2040_07/02/2020		ND20-GM07-4060_07/02/2020		ND20-GM07-6080_07/02/2020		ND20-GM07-8010_07/02/2020		ND20-GM08-SURF_06/29/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		07-02-2020		06-29-2020	
								Sample Depth (ft bss)	2 - 4		4 - 6		6 - 8		8 - 10		0 - 0.3	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	**2700**		**19000**		1.1	J	< 4.4		**450**	
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	**400**		**4700**		0.45	J	< 4.4		**78**	
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 80		< 180		< 4.3		< 4.4		< 33	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 80		< 180		< 4.3		< 4.4		< 33	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	**380**		**4100**		< 4.3		< 4.4		110	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	**410**		**5100**		< 4.3		< 4.4		110	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 800		< 1800		< 43		< 44		< 330	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 80	UJ	< 180	UJ	< 4.3	UJ	< 4.4	UJ	< 33	
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	< 2000	UJ	< 4600	UJ	< 110	UJ	< 110	UJ	< 830	UJ
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	**2500**		**26000**		1.9	J	0.56	J	**230**	
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 400		< 900		< 21		< 22		< 160	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 2000		< 4600		< 110		< 110		< 830	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	**2400**		**24000**		1.4	J	< 4.4		**390**	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**15000**		**150000**		6		1		**2800**	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**15000**		**150000**		16		14		**2800**	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**15000**		**150000**		41		47		**2800**	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.29	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.19	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.00304	J
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.00206	J
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.0045	J
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.0092	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.0056	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.0066	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		< 0.0049	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.0015	J
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.00087	J
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.0013	J
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.00115	J
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.00067	J
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.0016	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		3.8	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		0.17	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 2.2		< 1.9		< 1.6		< 1.6		< 2.5	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	3.6	J	5.6	J	< 25		< 25		< 40	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 2.8		< 2.5		< 2		< 2		< 3.3	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	< 2.5		< 2.2		< 1.8		< 1.8		< 2.9	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	61		44		23		21		94	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	35300		22400		6010		< 1000		39300	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM08		ND20-GM08		ND20-GM08		ND20-GM08		ND20-GM08	
								Sample ID	ND20-GM08-0320_07/02/2020		ND20-GM08-2040_07/02/2020		ND20-GM08-4060_07/02/2020		ND20-GM08-6080_07/02/2020		ND20-GM08-8010_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0.3 - 2		2 - 4		4 - 6		6 - 8		8 - 10	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	12100000		10300000		9790000		4600000		4020000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	820	J	< 10000		< 7100		< 7000		< 5400	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	6300		4300		4600		2200		2000	
Barium	SW6010	--	--	--	--	--	--	µg/kg	127000		83500		70300		30500		30200	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	560	J	510	J	490	J	230	J	190	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	810		780	J	680		210	J	150	J
Calcium	SW6010	--	--	--	--	--	--	µg/kg	15400000		16200000		18200000		20600000		22900000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	27600		24800		23500		11200		9900	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	9300		7500	J	7900		3800	J	3500	J
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	**129000**		**45800**		**45200**		11400		6600	
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	**23400000**		**21100000**		**20600000**		10900000		9860000	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	**111000**	*	**50100**	*	**47500**	*	7200	*	2700	*
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	10000000		9680000		10100000		7750000		8600000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	383000		302000		320000		228000		215000	
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	80	J	**220**		**190**		< 120		< 110	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	**23200**		20700		21500		10700		9600	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	1570000		1330000		1240000		595000		539000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	1000	J	< 5800		780	J	< 4100		< 3200	
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	< 1500		460	J	< 1200		< 1200		< 900	
Sodium	SW6010	--	--	--	--	--	--	µg/kg	377000	J	279000	J	289000	J	219000	J	197000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 3600		< 3800		< 3500		< 2600		< 2800	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	42900		35400		36100		25200		22800	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	**315000**		**204000**		**168000**		31300		16500	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM08		ND20-GM08		ND20-GM08		ND20-GM08		ND20-GM08	
								Sample ID	ND20-GM08-0320_07/02/2020		ND20-GM08-2040_07/02/2020		ND20-GM08-4060_07/02/2020		ND20-GM08-6080_07/02/2020		ND20-GM08-8010_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0.3 - 2		2 - 4		4 - 6		6 - 8		8 - 10	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-		-		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-		-		-		-		-	
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-		-		-		-		-	
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-		-		-		-		-	
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-		-		-		-		-	
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM08		ND20-GM08		ND20-GM08		ND20-GM08		ND20-GM08	
								Sample ID	ND20-GM08-0320_07/02/2020		ND20-GM08-2040_07/02/2020		ND20-GM08-4060_07/02/2020		ND20-GM08-6080_07/02/2020		ND20-GM08-8010_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0.3 - 2		2 - 4		4 - 6		6 - 8		8 - 10	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 81		< 110		< 100		< 8.9		< 4.1	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 81		< 110		< 100		< 8.9		< 4.1	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 4000		< 5600		< 4900		< 440		< 200	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 81		< 110		< 100		< 8.9		< 4.1	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	180		2200		520		36		0.25	J
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 2900		< 2500		< 230		< 100	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 2900		< 2500		< 230		< 100	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 2900		< 2500		< 230		< 100	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	56	J	110	J	90	J	7.3	J	< 20	
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 2900		< 2500		< 230		< 100	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	2700		330		520		33		< 4.1	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	47	J	82	J	54	J	4.4	J	< 4.1	
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 810		< 1100		< 1000		< 89		< 41	
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	710		540		580		52		< 4.1	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 810		< 1100		< 1000		< 89		< 41	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	35	J	< 1100		< 1000		< 89		0.84	J
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	550		1100		950		72		< 4.1	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	400		720		620		43		< 4.1	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	520		990		880		57		< 4.1	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	300		530		460		32		< 4.1	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	220		340		240		22		< 4.1	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	280	J	530	J	440	J	32	J	< 20	
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	39	J	57	J	69	J	5.1	J	< 20	
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 81		< 110		< 100		< 8.9		< 4.1	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	69	J	63	J	< 4900		< 440		2	J
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		1.3	J
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 2100	UJ	< 2900	UJ	< 2500	UJ	< 230	UJ	< 100	UJ
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	78	J	110	J	130		5	J	< 4.1	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	650		1400		1100		76		< 4.1	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	88		140		130		7.9	J	< 4.1	
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	1100		250	J	370	J	25	J	0.21	J
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 400		< 560		< 490		< 44		1.5	J
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 400	UJ	< 560	UJ	< 490	UJ	< 44	UJ	< 20	UJ

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM08		ND20-GM08		ND20-GM08		ND20-GM08		ND20-GM08	
								Sample ID	ND20-GM08-0320_07/02/2020		ND20-GM08-2040_07/02/2020		ND20-GM08-4060_07/02/2020		ND20-GM08-6080_07/02/2020		ND20-GM08-8010_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-02-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0.3 - 2		2 - 4		4 - 6		6 - 8		8 - 10	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	**1900**		**2600**		**2500**		220		< 4.1	
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	**2500**		**430**		**600**		46		< 4.1	
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 81		< 110		< 100		< 8.9		< 4.1	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 81		< 110		< 100		< 8.9		< 4.1	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	**250**		**430**		**360**		26		< 4.1	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	**240**		**380**		**460**		32		< 4.1	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 800		< 1100		< 1000		< 89		< 41	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 81	UJ	< 110	UJ	< 100	UJ	< 8.9	UJ	< 4.1	UJ
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	**< 2100**	**UJ**	**< 2900**	**UJ**	**< 2500**	**UJ**	**< 230**	**UJ**	< 100	UJ
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	**5000**		**2100**		**2600**		**250**		1	J
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 400		< 560		< 490		< 44		< 20	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 2100		< 2900		< 2500		< 230		< 100	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	**1800**		**2600**		**2400**		**210**		< 4.1	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**18000**		**17000**		**15000**		1300		1	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**18000**		**17000**		**15000**		1300		13	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**18000**		**17000**		**15000**		1300		43	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	-		-		-		-		-	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	58		70		52		26		21	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	33300		44400		22800		10500		3940	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM09		ND20-GM09		ND20-GM09		ND20-GM09		ND20-GM09	
								Sample ID	ND20-GM09-SURF_06/28/2020		ND20-GM09-0320_07/02/2020		ND20-GM09-2040_07/02/2020		ND20-GM09-4060_07/02/2020		ND20-GM09-6080_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	06-28-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		4 - 6		6 - 8	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**N**		**N**	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	11500000		11300000		8740000		5250000		4940000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	< 9100		< 10500		< 6900		< 6600		< 5100	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	4300		4200		4200		3300		2200	
Barium	SW6010	--	--	--	--	--	--	µg/kg	95400	*	105000		78600		39400		40500	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	410	J	490	J	400	J	270	J	250	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	380	J	390	J	420	J	270	J	190	J
Calcium	SW6010	--	--	--	--	--	--	µg/kg	10800000	*	13500000		14800000		15300000		31000000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	25300	J	24800		22600		13600		11900	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	8500		7900	J	7100		4800	J	4500	
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	22500		22200		21600	*	22400	*	10100	*
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	**22600000**		**22300000**		18300000		14000000		11300000	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	14200		16100	*	21900	J	18000	J	3500	J
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	8050000	*	8770000		8280000		6420000		11600000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	**747000**		**663000**		410000		231000		243000	
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	< 200		58	J	< 150		< 120		< 120	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	20700	J	20200		17200		12900		12400	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	1460000		1480000		1120000		623000		698000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	< 5300		1200	J	< 4000		< 3800		690	J
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	< 1500		< 1800		< 1200		< 1100		< 850	
Sodium	SW6010	--	--	--	--	--	--	µg/kg	275000	J	288000	J	276000	J	214000	J	216000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 3800		< 3500		< 2900		< 2700		< 2100	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	35800		35200		33100		28400		26500	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	80200	*	82400		96500		66300		21300	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM09	ND20-GM09	ND20-GM09	ND20-GM09	ND20-GM09
								Sample ID	ND20-GM09-SURF_06/28/2020	ND20-GM09-0320_07/02/2020	ND20-GM09-2040_07/02/2020	ND20-GM09-4060_07/02/2020	ND20-GM09-6080_07/02/2020
								Parent Sample ID	--	--	--	--	--
								Date	06-28-2020	07-02-2020	07-02-2020	07-02-2020	07-02-2020
								Sample Depth (ft bss)	0 - 0.3	0.3 - 2	2 - 4	4 - 6	6 - 8
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**	**N**	**N**	**N**	**N**
Volatile Organic Compounds													
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-	-	-	-	-
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-	-	-	-	-
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-	-	-	-	-
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-	-	-	-	-
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-	-	-	-	-

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM09		ND20-GM09		ND20-GM09		ND20-GM09		ND20-GM09	
								Sample ID	ND20-GM09-SURF_06/28/2020		ND20-GM09-0320_07/02/2020		ND20-GM09-2040_07/02/2020		ND20-GM09-4060_07/02/2020		ND20-GM09-6080_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	06-28-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		4 - 6		6 - 8	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 72		< 70		< 150		< 48		< 4.1	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 72		< 70		< 150		< 48		< 4.1	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 3600		< 3500		< 7200		< 2400		< 200	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 72		< 70		< 150		< 48		< 4.1	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	47	J	83		92	J	75		0.21	J
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1800		< 1800		< 3700		< 1200		< 100	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1800		< 1800		< 3700		< 1200		< 100	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1800		< 1800		< 3700		< 1200		< 100	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	19	J	22	J	33	J	37	J	< 20	
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1800		< 1800		< 3700		< 1200		< 100	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	54	J	150		200		160		1.8	J
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	22	J	38	J	55	J	64		< 4.1	
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 720		< 700		< 1500		< 480		0.75	J
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	80		270		420		300		< 4.1	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 720		< 700		< 1500		< 480		< 41	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	< 720		41	J	50	J-	< 480	UJ	1.7	J-
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	170		370		580		560		< 4.1	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	140		310		590		410		< 4.1	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	170		400		530		470		< 4.1	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	96		210		610		270		< 4.1	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	58	J	140		190		180		< 4.1	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	95	J	190	J	510	J	260		< 20	
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	11	J	30	J	28	J	17	J	0.48	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350	UJ	< 720		< 240		< 20	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 72		< 70		< 150		< 48		< 4.1	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 3600		< 3500		< 7200		46	J	< 200	
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		2.1	J
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 1800		< 1800		< 3700		< 1200		3.5	J
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	23	J	83		110	J	53		< 4.1	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	190		400		770		560		< 4.1	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	80		61	J	240		110		< 4.1	
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	46	J	140	J	170	J	85	J	< 20	
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	13	J	< 350		< 720		< 240		0.75	J
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 360		17	J	< 720		< 240		1.8	J
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 360		< 350		< 720		< 240		< 20	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM09		ND20-GM09		ND20-GM09		ND20-GM09		ND20-GM09	
								Sample ID	ND20-GM09-SURF_06/28/2020		ND20-GM09-0320_07/02/2020		ND20-GM09-2040_07/02/2020		ND20-GM09-4060_07/02/2020		ND20-GM09-6080_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	06-28-2020		07-02-2020		07-02-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		4 - 6		6 - 8	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**N**		**N**	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	380		**910**		**1400**		**1400**		0.85	J
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	67	J	**210**		**250**		**210**		0.88	J
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 72		< 70		< 150		< 48		< 4.1	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 72		< 70		< 150		< 48		< 4.1	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	89		**210**		**330**		**250**		< 4.1	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	80		170		**200**		110		< 4.1	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 720		< 700		< 1400		< 480		< 41	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 72		< 70		< 150		< 48		< 4.1	
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	**< 1800**		**< 1800**	**UJ**	**< 3700**	**UJ**	**< 1200**	**UJ**	< 100	UJ
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	**250**		**750**		**1300**		**1100**		1.3	J
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 360		< 350		< 720		< 240		< 20	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1800		< 1800		< 3700		< 1200		< 100	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	**330**		**600**		**1200**		**1100**		0.77	J
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**2400**		**5500**		**9500**		**7600**		6	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**2400**		**5500**		**9500**		**7600**		15	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**2400**		**5500**		**9500**		**7600**		39	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 2.8	UJ	< 2.5		< 2.1		57		< 1.6	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	< 44		< 40		< 34		1.9	J+	< 25	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 3.6		< 3.3		< 2.8		< 2.3		< 2.1	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	**< 3.2**		**< 2.9**		**28**	**J+**	**81**		**< 1.8**	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	120		91		68		38		23	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	27200		30500		29200		15500		1760	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM09		ND20-GM10		ND20-GM10		ND20-GM10		ND20-GM10	
								Sample ID	ND20-GM09-8010_07/02/2020		ND20-GM10-SURF_06/28/2020		ND20-GM10-0320_07/01/2020		ND20-GM10-0320FD_07/01/2020		ND20-GM10-2040_07/01/2020	
								Parent Sample ID	--		--		--		ND20-GM10-0320_07/01/2020		--	
								Date	07-02-2020		06-28-2020		07-01-2020		07-01-2020		07-01-2020	
								Sample Depth (ft bss)	8 - 10		0 - 0.3		0.3 - 2		0.3 - 2		2 - 4	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**FD**		**N**	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	5020000		11700000		7930000		8470000		7960000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	< 6400		< 9900		< 6600		< 6800		< 8100	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	2900		4000		4000		4400		3700	
Barium	SW6010	--	--	--	--	--	--	µg/kg	37800		97500	*	56700		65400		56000	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	230	J	420	J	390	J	400	J	410	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	200	J	400	J	550	J	530	J	560	J
Calcium	SW6010	--	--	--	--	--	--	µg/kg	33700000		11900000	*	12300000		13100000		14300000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	12000		26100	J	19400		20700		18500	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	4300	J	8900		6500		7100		6200	J
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	8900	*	22900		**41500**		**46600**		**47300**	
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	10700000		**23200000**		16300000		17400000		16700000	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	3300	J	14500		**44200**	*	**36100**	*	**52800**	*
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	13200000		8830000	*	7420000		7970000		7800000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	274000		**637000**		245000		286000		244000	
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	< 100		< 180		99	J	100	J	140	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	11200		**27100**	**J**	16800		17600		16500	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	738000		1440000		964000		1070000		996000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	< 3700		1000	J	< 3800		< 4000		910	J
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	< 1100		< 1600		160	J	110	J	< 1300	
Sodium	SW6010	--	--	--	--	--	--	µg/kg	239000	J	289000	J	271000	J	271000	J	250000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 2700		< 4100		< 3500		< 3000		< 2700	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	26100		36800		31900		33200		31900	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	20500		82500	*	**130000**		**129000**		**144000**	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM09		ND20-GM10		ND20-GM10		ND20-GM10		ND20-GM10	
								Sample ID	ND20-GM09-8010_07/02/2020		ND20-GM10-SURF_06/28/2020		ND20-GM10-0320_07/01/2020		ND20-GM10-0320FD_07/01/2020		ND20-GM10-2040_07/01/2020	
								Parent Sample ID	--		--		--		ND20-GM10-0320_07/01/2020		--	
								Date	07-02-2020		06-28-2020		07-01-2020		07-01-2020		07-01-2020	
								Sample Depth (ft bss)	8 - 10		0 - 0.3		0.3 - 2		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		FD		N	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-		-		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-		-		-		-		-	
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-		-		-		-		-	
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-		-		-		-		-	
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-		-		-		-		-	
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM09		ND20-GM10		ND20-GM10		ND20-GM10		ND20-GM10	
								Sample ID	ND20-GM09-8010_07/02/2020		ND20-GM10-SURF_06/28/2020		ND20-GM10-0320_07/01/2020		ND20-GM10-0320FD_07/01/2020		ND20-GM10-2040_07/01/2020	
								Parent Sample ID	--		--		--		ND20-GM10-0320_07/01/2020		--	
								Date	07-02-2020		06-28-2020		07-01-2020		07-01-2020		07-01-2020	
								Sample Depth (ft bss)	8 - 10		0 - 0.3		0.3 - 2		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		FD		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 4.2		< 67		< 170		< 80		< 50	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 4.2		< 67		< 170		< 80		< 50	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 21		< 330		< 850		23	J	30	J
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 3300		< 8500		< 3900		< 2500	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 4.2		< 67		< 170		< 80		< 50	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	< 4.2		**24**	**J**	**340**		**350**		**340**	
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 21		< 330		< 850		12	J	15	J
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 110		< 1700		< 4400		< 2000		< 1300	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 110		< 1700		< 4400		< 2000		< 1300	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 110		< 1700		< 4400		< 2000		< 1300	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 21		7.4	J	78	J	87	J	140	J
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 110		< 1700		< 4400		< 2000		< 1300	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	< 4.2		**40**	**J**	**680**		**910**		**960**	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	< 4.2		**18**	**J**	**55**	**J**	**50**	**J**	**150**	
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	0.44	J	< 670		< 1700		< 800		< 500	
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	< 4.2		**110**		**900**		**1100**		**1400**	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 42		< 670		< 1700		< 800		< 500	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	1.4	J-	< 670		40	J	45	J	< 500	
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	< 4.2		**230**		**2100**		**1400**		**2400**	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	< 4.2		**200**		**2000**		**990**		**1900**	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	< 4.2		220		**2300**		**1400**		**2200**	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	< 4.2		130		**1200**		**540**		**1200**	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	< 4.2		91		**740**		**430**		**880**	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	< 21		120	J	**1600**		**660**		**1100**	
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		76	J	80	J	84	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 4.2		< 67		< 170		< 80		< 50	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 210		< 3300		< 8500		270	J	< 2500	
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 110		< 1700		< 4400	UJ	< 2000	UJ	< 1300	UJ
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	< 4.2		16	J	380		270		540	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	< 4.2		**230**		**2200**		**1400**		**2300**	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	< 4.2		**88**		**440**		**160**		**270**	
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	< 21		36	J	**410**	**J**	**500**		**510**	
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	0.61	J	< 330		**< 850**		< 390		< 250	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 21		< 330		**< 850**		< 390		< 250	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	1.7	J	< 330		< 850		< 390		< 250	
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 21		< 330		**< 850**		< 390		< 250	UJ

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM09		ND20-GM10		ND20-GM10		ND20-GM10		ND20-GM10	
								Sample ID	ND20-GM09-8010_07/02/2020		ND20-GM10-SURF_06/28/2020		ND20-GM10-0320_07/01/2020		ND20-GM10-0320FD_07/01/2020		ND20-GM10-2040_07/01/2020	
								Parent Sample ID	--		--		--		ND20-GM10-0320_07/01/2020		--	
								Date	07-02-2020		06-28-2020		07-01-2020		07-01-2020		07-01-2020	
								Sample Depth (ft bss)	8 - 10		0 - 0.3		0.3 - 2		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		FD		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	< 4.2		500		4600		3800		5400	
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	0.25	J	66	J	810		1300		990	
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 4.2		< 67		< 170		< 80		< 50	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 4.2		< 67		< 170		< 80		< 50	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	< 4.2		120		870		470		1000	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	0.4	J	44	J	620		670		530	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 42		< 660		< 1700		< 800		< 500	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 4.2		< 67		< 170		< 80		< 50	UJ
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	< 110	UJ	< 1700		< 4400		< 2000		< 1300	UJ
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	0.93	J	260		4200		5100		5800	
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 21		< 330		< 850		< 390		< 250	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 110		< 1700		< 4400		< 2000		< 1300	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	< 4.2		410		4500		3500		5800	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	2		2900		30000		24000		35000	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	13		2900		30000		24000		35000	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	42		2900		30000		24000		35000	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 1.6		-		-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	< 26		-		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 2.1		-		-		-		-	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	0.58	J	-		-		-		-	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	22		100		59		56		49	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	9690		27200		39400		42000		27800	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM10		ND20-GM10		ND20-GM11		ND20-GM11		ND20-GM11	
								Sample ID	ND20-GM10-4060_07/01/2020		ND20-GM10-4060FD_07/01/2020		ND20-GM11-SURF_06/28/2020		ND20-GM11-SURFFD_06/28/2020		ND20-GM11-0320_07/01/2020	
								Parent Sample ID	--		ND20-GM10-4060_07/01/2020		--		ND20-GM11-SURF_06/28/2020		--	
								Date	07-01-2020		07-01-2020		06-28-2020		06-28-2020		07-01-2020	
								Sample Depth (ft bss)	4 - 6		4 - 6		0 - 0.3		0 - 0.3		0.3 - 2	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		FD		N		FD		N	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	5680000		7820000		10000000		9740000		8020000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	< 6200		< 6700		650	J	< 9100		< 6400	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	3500		3400		3500		4200		3600	
Barium	SW6010	--	--	--	--	--	--	µg/kg	41100		57800		78200	*	79100	*	63900	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	320	J	390	J	370	J	390	J	390	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	400	J	530	J	320	J	340	J	300	J
Calcium	SW6010	--	--	--	--	--	--	µg/kg	17400000		17300000		10600000	*	11400000	*	15700000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	15800		19600		21900	J	22100	J	18300	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	5000	J	6200		7800		7800		6500	
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	21800		27800		17400		17700		15000	
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	13100000		16400000		**20800000**		**20700000**		17100000	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	**47300**	*	**38300**	*	11200		11400		11700	*
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	7780000		8740000		7150000	*	7340000	*	7530000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	216000		267000		**687000**		**713000**		423000	
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	95	J	**190**		< 180		< 160		< 150	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	13900		16500		18700	J	19200	J	16000	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	717000		1020000		1250000		1200000		1030000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	< 3600		< 3900		720	J	< 5300		< 3700	
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	< 1000		100	J	< 1300		< 1500		< 1100	
Sodium	SW6010	--	--	--	--	--	--	µg/kg	230000	J	258000	J	251000	J	246000	J	255000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 3000		< 2700		< 3300		< 3800		< 2800	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	27300		31500		33300		32600		31300	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	94700		**131000**		66000	*	68800	*	56900	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM10	ND20-GM10	ND20-GM11	ND20-GM11	ND20-GM11
								Sample ID	ND20-GM10-4060_07/01/2020	ND20-GM10-4060FD_07/01/2020	ND20-GM11-SURF_06/28/2020	ND20-GM11-SURFFD_06/28/2020	ND20-GM11-0320_07/01/2020
								Parent Sample ID	--	ND20-GM10-4060_07/01/2020	--	ND20-GM11-SURF_06/28/2020	--
								Date	07-01-2020	07-01-2020	06-28-2020	06-28-2020	07-01-2020
								Sample Depth (ft bss)	4 - 6	4 - 6	0 - 0.3	0 - 0.3	0.3 - 2
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**	**FD**	**N**	**FD**	**N**
Volatile Organic Compounds													
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-	-	-	-	-
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-	-	-	-	-
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-	-	-	-	-
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-	-	-	-	-
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-	-	-	-	-

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM10		ND20-GM10		ND20-GM11		ND20-GM11		ND20-GM11	
								Sample ID	ND20-GM10-4060_07/01/2020		ND20-GM10-4060FD_07/01/2020		ND20-GM11-SURF_06/28/2020		ND20-GM11-SURFFD_06/28/2020		ND20-GM11-0320_07/01/2020	
								Parent Sample ID	--		ND20-GM10-4060_07/01/2020		--		ND20-GM11-SURF_06/28/2020		--	
								Date	07-01-2020		07-01-2020		06-28-2020		06-28-2020		07-01-2020	
								Sample Depth (ft bss)	4 - 6		4 - 6		0 - 0.3		0 - 0.3		0.3 - 2	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		FD		N		FD		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 47		< 55		< 64		< 63		< 50	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 47		< 55		< 64		< 63		< 50	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	16	J	< 270		< 320		< 310		< 250	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 2300		< 2700		< 3200		< 3100		< 2500	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 47		< 55		< 64		< 63		< 50	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	**220**		**300**		**24**	**J**	**48**	**J**	**59**	
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1200		< 1400		< 1600		< 1600		< 1300	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1200		< 1400		< 1600		< 1600		< 1300	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1200		< 1400		< 1600		< 1600		< 1300	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	62	J	74	J	< 320		12	J	11	J
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1200		< 1400		< 1600		< 1600		< 1300	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	**300**		**410**		**43**	**J**	**93**		**180**	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	**30**	**J**	**32**	**J**	**15**	**J**	**21**	**J**	**14**	**J**
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 470		< 550		< 640		< 630		< 500	
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	**450**		**560**		56	J	**110**		**220**	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 470		< 550		< 640		< 630		< 500	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	< 470		< 550		20	J	20	J	22	J
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	**690**		**730**		**110**		**260**		**310**	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	**510**		**490**		91		**220**		**210**	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	**590**		**630**		110		**280**		**280**	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	**310**		**310**		65		150		150	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	**270**		240		50	J	110		110	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	**330**		**330**		61	J	140	J	140	J
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	35	J	50	J	7	J	14	J	15	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 47		< 55		< 64		< 63		< 50	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 2300		< 2700		28	J	< 3100		25	J
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 230		3.2	J	< 320		< 310		< 250	
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 1200	UJ	< 1400	UJ	< 1600		< 1600		< 1300	UJ
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	98		130		17	J	54	J	52	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	**700**		**760**		110		**260**		**330**	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	**83**		**91**		**69**		**93**		33	J
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	**190**	**J**	**270**	**J**	29	J	69	J	94	J
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	< 230		< 270		9.6	J	< 310		< 250	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 230	UJ	< 270	UJ	< 320		< 310		< 250	UJ

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM10		ND20-GM10		ND20-GM11		ND20-GM11		ND20-GM11	
								Sample ID	ND20-GM10-4060_07/01/2020		ND20-GM10-4060FD_07/01/2020		ND20-GM11-SURF_06/28/2020		ND20-GM11-SURFFD_06/28/2020		ND20-GM11-0320_07/01/2020	
								Parent Sample ID	--		ND20-GM10-4060_07/01/2020		--		ND20-GM11-SURF_06/28/2020		--	
								Date	07-01-2020		07-01-2020		06-28-2020		06-28-2020		07-01-2020	
								Sample Depth (ft bss)	4 - 6		4 - 6		0 - 0.3		0 - 0.3		0.3 - 2	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		FD		N		FD		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	**1700**		**2100**		260		**650**		**810**	
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	**370**		**500**		54	J	**110**		**210**	
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 47		< 55		< 64		< 63		< 50	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 47		< 55		< 64		< 63		< 50	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	**250**		**260**		61	J	150		120	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	**290**		**410**		48	J	110		95	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 470		< 550		< 640		< 630		< 500	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 47	UJ	< 55	UJ	< 64		< 63		< 50	UJ
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	< 1200	UJ	< 1400	UJ	< 1600		< 1600		< 1300	UJ
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	**1800**		**2500**		170		**520**		**810**	
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 230		< 270		< 320		< 310		< 250	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1200		< 1400		< 1600		< 1600		< 1300	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	**1800**		**2100**		**220**		**510**		**840**	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**11000**		**13000**		1600		**3800**		**4900**	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**11000**		**13000**		1600		**3800**		**4900**	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	**11000**		**13000**		1600		**3800**		**4900**	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		< 2.5	UJ	< 2.4	UJ	< 2	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		-		< 40		< 39		< 31	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		-		< 3.3		< 3.2		< 2.6	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	-		-		**19**	J	< 2.8	UJ	< 2.3	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	44		52		92		87		51	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	14500		19800		17400		20700		16800	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM11		ND20-GM11		ND20-GM12		ND20-GM12		ND20-GM12	
								Sample ID	ND20-GM11-2040_07/01/2020		ND20-GM11-4060_07/01/2020		ND20-GM12-SURF_06/28/2020		ND20-GM12-0320_07/02/2020		ND20-GM12-2040_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-01-2020		07-01-2020		06-28-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.3		0.3 - 2		2 - 4	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**N**		**N**	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	8690000		8110000		8490000		7220000		5680000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	< 7600		< 5500		< 7300		< 8400		< 9700	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	4000		4000		3100		3900		2500	
Barium	SW6010	--	--	--	--	--	--	µg/kg	83100		57200		69200	*	63400		45600	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	390	J	370	J	310	J	360	J	300	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	410	J	370	J	300	J	320	J	250	J
Calcium	SW6010	--	--	--	--	--	--	µg/kg	13800000		22100000		10100000	*	10300000		13100000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	20500		18500		19000	J	17600		14200	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	6900		6400		6800		6300	J	4600	J
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	21500		18800		16900		16000		15100	
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	18300000		16600000		17800000		15600000		10600000	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	16500	*	14700	*	12600		16600		10800	
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	7910000		10500000		6030000	*	6660000		5980000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	422000		425000		**535000**		349000		208000	
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	70	J	51	J	< 150		58	J	< 190	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	17200		16600		16300	J	15400		12500	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	1110000		1090000		1040000		887000		639000	J
Selenium	SW6010	--	--	--	--	--	--	µg/kg	830	J	650	J	< 4300		< 4900		< 5700	
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	< 1300		< 920		< 1200		< 1400		< 1600	
Sodium	SW6010	--	--	--	--	--	--	µg/kg	266000	J	286000	J	227000	J	221000	J	179000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 3400		< 2800		< 3100		< 3500		< 4000	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	32300		31900		27800		29200		24100	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	91200		66900		70500	*	69900		30100	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 62		< 51		< 64	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 62		< 51		< 64	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 62		< 51		< 64	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 62		< 51		< 64	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 62		< 51		< 64	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 62		26	J	< 64	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	-		-		7	J	< 51		3.7	J
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 62		< 51		< 64	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	-		-		< 62		< 51		< 64	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	-		-		7		26		3.7	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM11		ND20-GM11		ND20-GM12		ND20-GM12		ND20-GM12	
								Sample ID	ND20-GM11-2040_07/01/2020		ND20-GM11-4060_07/01/2020		ND20-GM12-SURF_06/28/2020		ND20-GM12-0320_07/02/2020		ND20-GM12-2040_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-01-2020		07-01-2020		06-28-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-		-		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-		-		-		-		-	
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-		-		-		-		-	
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-		-		-		-		-	
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-		-		-		-		-	
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-		-		-		-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM11		ND20-GM11		ND20-GM12		ND20-GM12		ND20-GM12	
								Sample ID	ND20-GM11-2040_07/01/2020		ND20-GM11-4060_07/01/2020		ND20-GM12-SURF_06/28/2020		ND20-GM12-0320_07/02/2020		ND20-GM12-2040_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-01-2020		07-01-2020		06-28-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 56		< 70		< 31		< 79		< 96	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 56		< 70		< 31		< 79		< 96	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 280		9.2	J	< 150		< 390		< 470	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 2800		< 3500		< 1500		39	J	< 4700	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 56		< 70		< 31		< 79		< 96	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	110		120		30	J	130		7.4	J
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1400		< 1800		< 780		< 2000		< 2400	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1400		< 1800		< 780		< 2000		< 2400	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1400		< 1800		< 780		< 2000		< 2400	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	33	J	21	J	6.6	J	60	J	< 470	
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1400		< 1800		< 780		< 2000		< 2400	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	380		180		47		200		89	J
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	37	J	31	J	15	J	160		< 96	
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 560		< 700		< 310		16	J	< 960	
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	900		250		61		490		76	J
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 560		< 700		< 310		< 790		< 960	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	33	J	20	J	18	J	52	J-	31	J-
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	820		480		120		950		71	J
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	440		400		110		610		48	J
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	700		490		130		760		64	J
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	270		260		75		410		37	J
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	210		210		51		260		26	J
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	310		250	J	70	J	380	J	29	J
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	28	J	30	J	10	J	34	J	< 470	
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 56		< 70		< 31		< 79		< 96	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	64	J	52	J	< 1500		110	J	< 4700	
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 1400	UJ	< 1800	UJ	< 780		< 2000		64	J
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	76		110		19	J	76	J	< 96	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	970		560		120		1200		76	J
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	74		91		43		170		< 96	
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	270	J	170	J	42	J	130	J	9.1	J
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 280	UJ	< 350	UJ	< 150		< 390		< 470	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM11		ND20-GM11		ND20-GM12		ND20-GM12		ND20-GM12	
								Sample ID	ND20-GM11-2040_07/01/2020		ND20-GM11-4060_07/01/2020		ND20-GM12-SURF_06/28/2020		ND20-GM12-0320_07/02/2020		ND20-GM12-2040_07/02/2020	
								Parent Sample ID	--		--		--		--		--	
								Date	07-01-2020		07-01-2020		06-28-2020		07-02-2020		07-02-2020	
								Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	2100		1000		270		2100		270	
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	570		270		58		240		72	J
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 56		< 70		< 31		< 79		< 96	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 56		< 70		< 31		< 79		< 96	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	230		230		67		380		33	J
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	180		280		63		240		12	J
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 560		< 700		< 310		< 790		< 950	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 56	UJ	< 70	UJ	< 31		< 79		< 96	
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 280		< 350		< 150		< 390		< 470	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	< 1400	UJ	< 1800	UJ	< 780		< 2000	UJ	< 2400	UJ
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	2100		1100		160		880		340	
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 280		< 350		2.2	J	< 390		< 470	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1400		< 1800		< 780		< 2000		< 2400	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	2000		1100		230		1600		200	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	12000		7300		1700		11000		1500	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	12000		7300		1700		11000		1500	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	12000		7300		1700		11000		1500	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 1.9		1.6	J	-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	< 31		< 27		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 2.5		< 2.3		-		-		-	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	< 2.2		5.3		-		-		-	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	51		37		83		58		91	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	25600		17300		23900		22700		41600	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM12		ND20-GM13		ND20-GM14		ND20-GM14		ND20-GM14	
								Sample ID	ND20-GM12-4060_07/02/2020		ND20-GM13-SURF_07/01/2020		ND20-GM14-SURF_06/30/2020		ND20-GM14-SURFFD_06/30/2020		ND20-GM14-0320_07/02/2020	
								Parent Sample ID	--		--		--		ND20-GM14-SURF_06/30/2020		--	
								Date	07-02-2020		07-01-2020		06-30-2020		06-30-2020		07-02-2020	
								Sample Depth (ft bss)	4 - 6		0 - 0.3		0 - 0.3		0 - 0.3		0.3 - 2	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		FD		N	
Metals																		
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	5380000		6860000		6340000		5790000		7940000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	< 6500		< 6900		< 6100		< 6400		< 7500	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	3000		3000		2900		2800		3400	
Barium	SW6010	--	--	--	--	--	--	µg/kg	42700		59100		39000		39000		58400	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	300	J	340	J	280	J	260	J	440	J
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	320	J	260	J	180	J	180	J	430	J
Calcium	SW6010	--	--	--	--	--	--	µg/kg	19900000		9200000		5990000		6170000		11200000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	13200		16700		14100		13600		18900	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	5500		5900		5200		4900	J	7200	
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	**40700**		16400		9400		9000		18900	
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	12300000		14600000		14000000		13100000		17000000	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	24000		10200		6500		6400		**70700**	
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	8710000		5670000		4110000		4210000		7400000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	251000		425000		**461000**	*	362000	*	302000	
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	72	J	52	J	< 150		< 130		130	J
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	13500		14300		12000		11600		17200	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	708000		845000		756000		700000		978000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	< 3800		< 4100		560	J	< 3700		730	J
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	230	J	< 1200		< 1000		< 1100		120	J
Sodium	SW6010	--	--	--	--	--	--	µg/kg	208000	J	205000	J	215000	J	206000	J	221000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 2700		< 2900		< 2600		< 2700		< 3100	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	24200		26600		29200		28100		29300	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	66800		50900		35200		34200		92000	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	< 46		-		-		-		-	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	< 46		-		-		-		-	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	< 46		-		-		-		-	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	< 46		-		-		-		-	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	< 46		-		-		-		-	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	36	J	-		-		-		-	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	< 46		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	< 46		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	< 46		-		-		-		-	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	36		-		-		-		-	

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Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM12	ND20-GM13	ND20-GM14	ND20-GM14	ND20-GM14
								Sample ID	ND20-GM12-4060_07/02/2020	ND20-GM13-SURF_07/01/2020	ND20-GM14-SURF_06/30/2020	ND20-GM14-SURFFD_06/30/2020	ND20-GM14-0320_07/02/2020
								Parent Sample ID	--	--	--	ND20-GM14-SURF_06/30/2020	--
								Date	07-02-2020	07-01-2020	06-30-2020	06-30-2020	07-02-2020
								Sample Depth (ft bss)	4 - 6	0 - 0.3	0 - 0.3	0 - 0.3	0.3 - 2
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**	**N**	**N**	**FD**	**N**
Volatile Organic Compounds													
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-	-	-	-	-
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-	-	-	-	-
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-	-	-	-	-
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-	-	-	-	-
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-	-	-	-	-
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-	-	-	-	-

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM12		ND20-GM13		ND20-GM14		ND20-GM14		ND20-GM14	
								Sample ID	ND20-GM12-4060_07/02/2020		ND20-GM13-SURF_07/01/2020		ND20-GM14-SURF_06/30/2020		ND20-GM14-SURFFD_06/30/2020		ND20-GM14-0320_07/02/2020	
								Parent Sample ID	--		--		--		ND20-GM14-SURF_06/30/2020		--	
								Date	07-02-2020		07-01-2020		06-30-2020		06-30-2020		07-02-2020	
								Sample Depth (ft bss)	4 - 6		0 - 0.3		0 - 0.3		0 - 0.3		0.3 - 2	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N		N		FD		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 68		< 28		< 9.8		< 9.4		< 45	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 68		< 28		< 9.8		< 9.4		< 45	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 3300		< 1400		< 480		< 460		< 2200	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 68		< 28		< 9.8		< 9.4		< 45	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	**130**		**28**		9.5	J	11		**160**	
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1700		< 710		< 250		< 240		< 1100	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1700		< 710		< 250		< 240		< 1100	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1700		< 710		< 250		< 240		< 1100	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	59	J	< 140		< 48		< 46		39	J
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 1700		< 710	UJ	< 250		< 240		< 1100	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	**490**		**32**		**20**		**26**		**360**	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	**61**	**J**	**14**	**J**	5.5	J	5	J	**36**	**J**
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 680		< 280		< 98		< 94		< 450	
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	**960**		51		22		24		**530**	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 680		< 280		< 98		< 94		< 450	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	26	J-	16	J	2.8	J	< 94		< 450	
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	**2200**		82		40		50		**860**	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	**1800**		68		37		46		**720**	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	**1900**		94		44		57		**810**	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	**1300**		53		27		38		**440**	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	**700**		36		17		21		**260**	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	**1000**		50	J	24	J	32	J	**420**	
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	31	J	7.8	J	2.6	J	2.4	J	40	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 68		< 28		< 9.8		< 9.4		< 45	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 3300		< 1400		8	J	11	J	< 2200	
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 330		12	J	< 48		< 46		< 220	
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 1700		< 710	UJ	< 250	UJ	< 240	UJ	< 1100	
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	470		14	J	5.4	J	3.8	J	190	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	**2000**		110		44		54		**860**	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	**350**		15	J	7.4	J	11		**140**	
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	**180**	**J**	33	J	16	J	12	J	**190**	**J**
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	< 330		< 140		< 48		1.8	J	< 220	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 330		< 140		< 48		2.6	J	< 220	
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 330		< 140		< 48		< 46		< 220	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM12		ND20-GM13		ND20-GM14		ND20-GM14		ND20-GM14	
								Sample ID	ND20-GM12-4060_07/02/2020		ND20-GM13-SURF_07/01/2020		ND20-GM14-SURF_06/30/2020		ND20-GM14-SURFFD_06/30/2020		ND20-GM14-0320_07/02/2020	
								Parent Sample ID	--		--		--		ND20-GM14-SURF_06/30/2020		--	
								Date	07-02-2020		07-01-2020		06-30-2020		06-30-2020		07-02-2020	
								Sample Depth (ft bss)	4 - 6		0 - 0.3		0 - 0.3		0 - 0.3		0.3 - 2	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**		**N**		**FD**		**N**	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	5400		230		98		120		2400	
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	490		51		29		20		370	
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 68		< 28		< 9.8		< 9.4		< 45	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 68		< 28		< 9.8		< 9.4		< 45	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	1100		46		22		32		400	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	200		49		17		24		260	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 670		< 280		< 98		< 93		< 450	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 68		< 28	UJ	< 9.8		< 9.4		< 45	
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 330		< 140		< 48		< 46		< 220	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	< 1700	UJ	< 710		< 250		< 240		< 1100	
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	4200		130		48		47		3100	
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 330		< 140		0.76	J	< 46		< 220	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 1700		< 710	UJ	< 250		< 240		< 1100	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	4500		150		68		86		2100	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	29000		1300		580		700		14000	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	29000		1300		580		700		14000	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	29000		1300		580		700		14000	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		< 2.2		< 1.9		< 1.8		< 1.8	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	-		< 34		< 29		< 28		< 29	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	-		< 2.8		< 2.4		< 2.3		< 2.4	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	-		4.5		< 2.1		< 2.1		< 2.1	
Other																		
Moisture	SM2540	--	--	--	--	--	--	%	34		67		46		40		35	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	15100		18700		9640		8260		17400	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM14		ND20-GM14	
								Sample ID	ND20-GM14-2040_07/02/2020		ND20-GM14-4060_07/02/2020	
								Parent Sample ID	--		--	
								Date	07-02-2020		07-02-2020	
								Sample Depth (ft bss)	2 - 4		4 - 6	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**	
Metals												
Aluminum	SW6010	--	--	--	--	--	--	µg/kg	13900000		12500000	
Antimony	SW6010	2000	13500	25000	50000	125000	--	µg/kg	< 6700		< 7200	
Arsenic	SW6010	9800	21400	33000	66000	165000	7200	µg/kg	3600		3900	
Barium	SW6010	--	--	--	--	--	--	µg/kg	95000		84100	
Beryllium	SW6010	--	--	--	--	--	--	µg/kg	760		710	
Cadmium	SW6010	990	3000	5000	10000	25000	--	µg/kg	260	J	280	J
Calcium	SW6010	--	--	--	--	--	--	µg/kg	18300000		16600000	
Chromium	SW6010	43000	76500	110000	220000	550000	47000	µg/kg	28800		32500	
Cobalt	SW6010	--	--	--	--	--	--	µg/kg	11700		10900	
Copper	SW6010	32000	91000	150000	300000	750000	50000	µg/kg	25500		27300	
Iron	SW6010	20000000	30000000	40000000	80000000	200000000	44910000	µg/kg	**23300000**		**21200000**	
Lead	SW6010	36000	83000	130000	260000	650000	75000	µg/kg	7400		7000	
Magnesium	SW6010	--	--	--	--	--	--	µg/kg	14500000		12600000	
Manganese	SW6010	460000	780000	1100000	2200000	5500000	1039000	µg/kg	**588000**		**521000**	
Mercury	SW6010	180	640	1100	2200	5500	590	µg/kg	< 140		< 140	
Nickel	SW6010	23000	36000	49000	98000	245000	38000	µg/kg	**28500**		**28300**	
Potassium	SW6010	--	--	--	--	--	--	µg/kg	2040000		1840000	
Selenium	SW6010	--	--	--	--	--	--	µg/kg	< 3900		< 4200	
Silver	SW6010	1600	1900	2200	4400	11000	--	µg/kg	< 1100		< 1200	
Sodium	SW6010	--	--	--	--	--	--	µg/kg	331000	J	326000	J
Thallium	SW6010	--	--	--	--	--	--	µg/kg	< 2800		< 3000	
Vanadium	SW6010	--	--	--	--	--	--	µg/kg	43300		41900	
Zinc	SW6010	120000	290000	460000	920000	2300000	210000	µg/kg	47300		40800	
Polychlorinated Biphenyls												
Aroclor 1016	SW8081	--	--	--	--	--	--	µg/kg	-		-	
Aroclor 1221	SW8081	--	--	--	--	--	--	µg/kg	-		-	
Aroclor 1232	SW8081	--	--	--	--	--	--	µg/kg	-		-	
Aroclor 1242	SW8081	--	--	--	--	--	--	µg/kg	-		-	
Aroclor 1248	SW8081	--	--	--	--	--	--	µg/kg	-		-	
Aroclor 1254	SW8081	--	--	--	--	--	--	µg/kg	-		-	
Aroclor 1260	SW8081	--	--	--	--	--	--	µg/kg	-		-	
Aroclor 1262	SW8081	--	--	--	--	--	--	µg/kg	-		-	
Aroclor 1268	SW8081	--	--	--	--	--	--	µg/kg	-		-	
Total PCBs (NDs=0)	Calculation	60	368	676	1352	3380	110	µg/kg	-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM14		ND20-GM14	
								Sample ID	ND20-GM14-2040_07/02/2020		ND20-GM14-4060_07/02/2020	
								Parent Sample ID	--		--	
								Date	07-02-2020		07-02-2020	
								Sample Depth (ft bss)	2 - 4		4 - 6	
Parameter	**Analytic Method**	**WDNR-2003-TEC**	**WDNR-2003-MEC**	**WDNR-2003-PEC**	**WDNR-2003-2XPEC**	**WDNR-2003-5XPEC**	**SLR AOC BTVs**	**Units**	**N**		**N**	
Volatile Organic Compounds												
1,1,1-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
1,1,2,2-Tetrachloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
1,1,2-Trichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
1,1-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
1,1-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
1,2,4-Trichlorobenzene	SW8260	8	13	18	36	90	--	µg/kg	-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	--	--	--	--	--	--	µg/kg	-		-	
1,2-Dibromoethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
1,2-Dichlorobenzene	SW8260	23	--	23	46	115	--	µg/kg	-		-	
1,2-Dichloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
1,2-Dichloropropane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
1,4-Dichlorobenzene	SW8260	31	60.5	90	180	450	--	µg/kg	-		-	
2-Butanone	SW8260	--	--	--	--	--	--	µg/kg	-		-	
2-Hexanone	SW8260	--	--	--	--	--	--	µg/kg	-		-	
4-Methyl-2-pentanone	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Acetone	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Benzene	SW8260	57	83.5	110	220	550	--	µg/kg	-		-	
Bromodichloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Bromoform	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Bromomethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Carbon Disulfide	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Carbon Tetrachloride	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Chlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Chloroethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Chloroform	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Chloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
cis-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
cis-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Cyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Dibromochloromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Ethylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Isopropylbenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
M-Dichlorobenzene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Methyl Acetate	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Methyl tert-Butyl Ether	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Methylcyclohexane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Methylene Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Styrene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Tetrachloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Toluene	SW8260	890	1345	1800	3600	9000	--	µg/kg	-		-	
trans-1,2-Dichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
trans-1,3-Dichloropropene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Trichloroethene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Trichlorofluoromethane	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Vinyl Chloride	SW8260	--	--	--	--	--	--	µg/kg	-		-	
m,p-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
o-Xylene	SW8260	--	--	--	--	--	--	µg/kg	-		-	
Xylenes (total)	SW8260	25	37.5	50	100	250	--	µg/kg	-		-	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM14		ND20-GM14	
								Sample ID	ND20-GM14-2040_07/02/2020		ND20-GM14-4060_07/02/2020	
								Parent Sample ID	--		--	
								Date	07-02-2020		07-02-2020	
								Sample Depth (ft bss)	2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N	
Semi-Volatile Organic Compounds												
2,2'-Oxybis(1-Chloropropane)	SW8270D	--	--	--	--	--	--	µg/kg	< 4.8		< 4.8	
2,4,5-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
2,4,6-Trichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
2,4-Dichlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 4.8		< 4.8	
2,4-Dimethyl Phenol	SW8270D	290	--	290	580	1450	--	µg/kg	< 23		< 24	
2,4-Dinitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 230		< 240	
2,4-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
2,6-Dinitrotoluene	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
2-Chloronaphthalene	SW8270D	--	--	--	--	--	--	µg/kg	< 4.8		< 4.8	
2-Chlorophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
2-Methylnaphthalene[1]	SW8270D	20.2	111	201	402	1005	--	µg/kg	< 4.8		< 4.8	
2-Methylphenol	SW8270D	6700	--	6700	13400	33500	--	µg/kg	< 23		< 24	
2-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 120		< 120	
2-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
3,3'-Dichlorobenzidine	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
3-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 120		< 120	
4,6-Dinitro-2-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 120		< 120	
4-Bromodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
4-Chloro-3-methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
4-Methylphenol	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
4-Nitrophenol	SW8270D	--	--	--	--	--	--	µg/kg	< 120		< 120	
Acenaphthene[1]	SW8270D	6.7	48	89	178	445	--	µg/kg	< 4.8		< 4.8	
Acenaphthylene[1]	SW8270D	5.9	67	128	256	640	--	µg/kg	< 4.8		< 4.8	
Acetophenone	SW8270D	--	--	--	--	--	--	µg/kg	< 48		1.6	J
Anthracene[1]	SW8270D	57.2	451	845	1690	4225	--	µg/kg	< 4.8		< 4.8	
Atrazine	SW8270D	--	--	--	--	--	--	µg/kg	< 48		< 48	
Benzaldehyde	SW8270D	--	--	--	--	--	--	µg/kg	7.2	J	15	J
Benzo (a) anthracene[1]	SW8270D	108	579	1050	2100	5250	--	µg/kg	< 4.8		< 4.8	
Benzo (a) pyrene[1]	SW8270D	150	800	1450	2900	7250	710	µg/kg	< 4.8		< 4.8	
Benzo (b) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	< 4.8		< 4.8	
Benzo (ghi) perylene[1]	SW8270D	170	1685	3200	6400	16000	--	µg/kg	< 4.8		< 4.8	
Benzo (k) fluoranthene[1]	SW8270D	240	6820	13400	26800	67000	--	µg/kg	< 4.8		< 4.8	
Benzo(e)pyrene[1]	SW8270D	150	800	1450	2900	7250	--	µg/kg	< 23		< 24	
Biphenyl	SW8270D	--	--	--	--	--	--	µg/kg	0.67	J	0.81	J
bis(2-Chloroethoxy) Methane	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
Bis-(2-Chloroethyl) Ether	SW8270D	--	--	--	--	--	--	µg/kg	< 4.8		< 4.8	
bis(2-Ethylhexyl)phthalate	SW8270D	--	--	--	--	--	--	µg/kg	10	J	< 240	
Butyl Benzyl Phthalate	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
Caprolactam	SW8270D	--	--	--	--	--	--	µg/kg	< 120		6.8	J
Carbazole	SW8270D	--	--	--	--	--	--	µg/kg	< 4.8		< 4.8	
Chrysene[1]	SW8270D	166	728	1290	2580	6450	--	µg/kg	< 4.8		< 4.8	
Dibenz (a,h) anthracene[1]	SW8270D	33	84	135	270	675	--	µg/kg	< 4.8		< 4.8	
Dibenzofuran	SW8270D	150	365	580	1160	2900	--	µg/kg	< 23		< 24	
Diethyl Phthalate	SW8270D	610	855	1100	2200	5500	--	µg/kg	0.9	J	< 24	
Dimethyl Phthalate	SW8270D	530	--	530	1060	2650	--	µg/kg	< 23		< 24	
Di-n-Butylphthalate	SW8270D	2200	9600	17000	34000	85000	--	µg/kg	< 23		0.71	J
Di-n-Octyl phthalate	SW8270D	580	22790	45000	90000	225000	--	µg/kg	< 23		< 24	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

								Location	ND20-GM14		ND20-GM14	
								Sample ID	ND20-GM14-2040_07/02/2020		ND20-GM14-4060_07/02/2020	
								Parent Sample ID	--		--	
								Date	07-02-2020		07-02-2020	
								Sample Depth (ft bss)	2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-2003-TEC	WDNR-2003-MEC	WDNR-2003-PEC	WDNR-2003-2XPEC	WDNR-2003-5XPEC	SLR AOC BTVs	Units	N		N	
Semi-Volatile Organic Compounds (continued)												
Fluoranthene[1]	SW8270D	423	1327	2230	4460	11150	--	µg/kg	1.3	J	0.92	J
Fluorene[1]	SW8270D	77.4	307	536	1072	2680	--	µg/kg	0.7	J	< 4.8	
Hexachlorobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 4.8		< 4.8	
Hexachlorobutadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 4.8		< 4.8	
Hexachlorocyclopentadiene	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
Hexachloroethane	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
Indeno (1,2,3-cd) pyrene[1]	SW8270D	200	1700	3200	6400	16000	--	µg/kg	< 4.8		< 4.8	
Isophorone	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
Naphthalene[1]	SW8270D	176	369	561	1122	2805	--	µg/kg	< 4.8		< 4.8	
Nitrobenzene	SW8270D	--	--	--	--	--	--	µg/kg	< 47		< 48	
N-Nitroso-Di-N-Propylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 4.8		< 4.8	
N-Nitrosodiphenylamine	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
P-Chloroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 23		< 24	
Pentachlorophenol	SW8270D	150	175	200	400	1000	--	µg/kg	< 120		< 120	
Phenanthrene[1]	SW8270D	204	687	1170	2340	5850	--	µg/kg	1.7	J	1.2	J
Phenol	SW8270D	4200	8100	12000	24000	60000	--	µg/kg	< 23		< 24	
P-Nitroaniline	SW8270D	--	--	--	--	--	--	µg/kg	< 120		< 120	
Pyrene[1]	SW8270D	195	858	1520	3040	7600	--	µg/kg	< 4.8		< 4.8	
Total PAH-18 (NDs=0)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	4		2	
Total PAH-18 (NDs=0.5 MDL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	17		16	
Total PAH-18 (NDs=0.5 RL)	Calculation	1610	12205	22800	45600	114000	7800	µg/kg	49		50	
Dioxins/Furans												
1,2,3,4,6,7,8-HPCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-	
1,2,3,4,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-	
1,2,3,4,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-	
1,2,3,6,7,8-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-	
1,2,3,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-	
1,2,3,7,8,9-HxCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-	
1,2,3,7,8,9-HxCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-	
1,2,3,7,8-PeCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-	
1,2,3,7,8-PeCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-	
2,3,4,6,7,8-HXCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-	
2,3,4,7,8-PECDF	E1613B	--	--	--	--	--	--	µg/kg	-		-	
2,3,7,8-TCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-	
2,3,7,8-TCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-	
OCDD	E1613B	--	--	--	--	--	--	µg/kg	-		-	
OCDF	E1613B	--	--	--	--	--	--	µg/kg	-		-	
Organotins												
Dibutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 1.8		< 1.8	
Monobutyltin as ion	RESTEK	--	--	--	--	--	--	µg/kg	< 29		< 29	
Tetrabutyl Tin	RESTEK	--	--	--	--	--	--	µg/kg	< 2.4		< 2.4	
Tri-n-butyltin hydride	RESTEK	0.52	1.73	2.94	5.88	14.7	--	µg/kg	< 2.1		< 2.1	
Other												
Moisture	SM2540	--	--	--	--	--	--	%	42		45	
Total Organic Carbon	SW9060	--	--	--	--	--	--	mg/kg	9490		13700	

Table 4-1.2
2020 Sediment Analytical Results-Ecological Assessment
General Mills Slip - Superior, WI

Footnotes:
< : Denotes concentration less than indicated detection reporting limit
Values are shaded based on the highest comparison criteria exceeded.
WDNR = Wisconsin Department of Natural Resources
Exceeds WDNR-2003-TEC = WDNR -Consensus-Based Sediment Quality Guidelines. Interim Guidance. December 2003. (TEC-threshold effect concentration)
Exceeds WDNR-2003-MEC = WDNR -Consensus-Based Sediment Quality Guidelines. Interim Guidance. December 2003. (MEC-midpoint effect concentration)
Exceeds WDNR-2003-PEC = WDNR -Consensus-Based Sediment Quality Guidelines. Interim Guidance. December 2003.(PEC-probable effect concentration).
Exceeds WDNR-2003-2XPEC = 2 times PEC values.
Exceeds WDNR-2003-5XPEC = 5 times PEC values.
Exceeds SLR AOC BTVs = The calculated Background Threshold Values for Sediment Contaminants in the St. Louis River Area of Concern.
MDL = Method detection limit.
ND = Non Detect
N = Sample type is a normal sample.
FD = Sample type is a field duplicate sample.
FR = Field Replicate
RL = Reporting Limit
"-" = Not analyzed
"--" = No Standard/Guideline
PAH = Polycyclic Aromatic Hydrocarbons
PCB = Polychlorinated Biphenyls
µg/kg = microgram per kilogram
mg/kg = milligrams per kilograms
ft bss = feet below sediment surface
% = percent
1 = Analyte was reported as an SVOC but it is considered a WDNR PAH and was used for Total PAH calculation.
Total PAH 18 = The 18 PAHs used in this calculation are: 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(e)pyrene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-Cd)Pyrene, Naphthalene, Phenanthrene, and Pyrene.
Total PAH-18 (NDs=0): This calculation includes the sum of 18 PAHs. Analytes that were not detected were given a value of 0. Results of the calculation were rounded to 2 significant figures.
Total PAH-18 (NDs=0.5 MDL): This calculation includes the sum of 18 PAHs. Analytes that were not detected were given a value of half the Method Detection Limit (MDL) for that analyte. Results of the calculation were rounded to 2 significant figures.
Total PAH-18 (NDs=0.5 RL): This calculation includes the sum of 18 PAHs. Analytes that were not detected were given a value of half the Reporting Limit (RL) for that analyte. Results of the calculation were rounded to 2 significant figures.
* = Post-digestion spike at 2 times the parent concentration.
J = Indicates that the concentration was detected above the method detection limit but below the reporting limit. The concentration is an estimated value.
J+ = Result is estimated but biased high.
J- = Result is estimated but biased low.
UJ = Analyte is not detected above the reported limit and the limit is estimated.

Table 4-2.1
2015 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	SW15-SLB04		SW15-SLB04		SW15-SLB05		SW15-SLB05		SW15-SLB05	
						Sample ID	SW15-SLB04-SURF_7/14/2015 2:00:00 PM		SW15-SLB04-0520_7/13/2015 3:45:00 PM		SW15-SLB05-SURF_7/8/2015 4:25:00 PM		SW15-SLB05-0520_7/9/2015 9:48:00 AM		SW15-SLB05-0520-FD_7/9/2015 9:48:00 AM	
						Parent Sample ID	--		--		--		--		SW15-SLB05-0520-FD_7/9/2015 9:48:00 AM	
						Date	07-14-2015		07-13-2015		07-08-2015		07-09-2015		07-09-2015	
						Sample Depth (ft bss)	0 - 0.5		0.5 - 2		0 - 0.5		0.5 - 2		0.5 - 2	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		FD	
Polycyclic Aromatic Hydrocarbons																
C1-Chrysenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	74	J	190	J	520	J	730	J	370	J
C1-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	390	J	920	J	3100	J	3100	J	1800	J
C1-Fluorenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 34		< 150		< 370		< 590		< 230	
C1-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 34		< 150		< 370		< 590		< 230	
C1-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	180	J	550	J	1400	J	1900	J	920	J
C2-Chrysenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	110	J	190	J	540	J	< 590		430	J
C2-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	240	J	400	J	1100	J	1300	J	720	J
C2-Fluorenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	70	J	< 150		< 370		< 590		< 230	
C2-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	110	J	330	J	< 370		610	J	390	J
C2-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	160	J	340	J	850	J	1100	J	570	J
C3-Chrysenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	64	J	< 150		< 370		< 590		< 230	
C3-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	160	J	270	J	430	J	< 590		390	J
C3-Fluorenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	84	J	< 150		< 370		< 590		< 230	
C3-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	180	J	330	J	460	J	660	J	450	J
C3-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	660	J	300	J	710	J	1300	J	720	J
C4-Chrysenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	56	J	170	J	< 370		< 590		280	J
C4-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	180	J	150	J	< 370		< 590		< 230	
C4-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	110	J	230	J	1100	J	1100	J	860	J
1-Methylnaphthalene	SOM02.2/SV SIM	17600	72700	--	--	µg/kg	< 34		< 150		< 370		< 590		< 230	
2-Methylnaphthalene	SOM02.2/SV SIM	239000	3010000	--	--	µg/kg	27	J	100	J	< 370		180	J	120	J
Acenaphthene	SOM02.2/SV SIM	3590000	45200000	--	--	µg/kg	19	J	140	J	130	J	370	J	270	
Acenaphthylene	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 34		14	J	120	J	< 590		20	J
Anthracene	SOM02.2/SV SIM	17900000	100000000	196949.1525	--	µg/kg	48		310		820		990		460	
Benzo (a) anthracene	SOM02.2/SV SIM	1140	20800	--	--	µg/kg	150		570		**1800**		**1700**		1100	
Benzo (a) pyrene	SOM02.2/SV SIM	115	2110	470	--	µg/kg	**120**		**470**		**1300**		**1300**		**820**	
Benzo (b) fluoranthene	SOM02.2/SV SIM	1150	21100	478.0876494	--	µg/kg	160		410		**1300**		**1800**		**870**	
Benzo (ghi) perylene	SOM02.2/SV SIM	--	--	--	--	µg/kg	67		240		550		720		340	
Benzo (k) fluoranthene	SOM02.2/SV SIM	11500	211000	--	--	µg/kg	120		390		1200		730		910	
Benzo(e)pyrene	SOM02.2/SV SIM	--	--	--	--	µg/kg	110		300		800		860		640	
Chrysene	SOM02.2/SV SIM	115000	2110000	144.2231076	--	µg/kg	**150**		**560**		**1500**		**2000**		**1100**	
Dibenz (a,h) anthracene	SOM02.2/SV SIM	115	2110	--	--	µg/kg	31	J	**120**	**J**	**190**	**J**	**200**	**J**	**160**	**J**
Fluoranthene	SOM02.2/SV SIM	2390000	30100000	88877.80549	--	µg/kg	440		1300		3900		4600		2800	
Fluorene	SOM02.2/SV SIM	2390000	30100000	14829.93197	--	µg/kg	40		150		210	J	560	J	370	
Indeno (1,2,3-cd) pyrene	SOM02.2/SV SIM	1150	21100	--	--	µg/kg	78		240		620		630		340	
Naphthalene	SOM02.2/SV SIM	5520	24100	658.1818182	--	µg/kg	43		100	J	68	J	260	J	200	J
Perylene	SOM02.2/SV SIM	--	--	--	--	µg/kg	160		190		470		< 590		310	
Phenanthrene	SOM02.2/SV SIM	--	--	--	--	µg/kg	230		1300		1600		4400		2400	
Pyrene	SOM02.2/SV SIM	1790000	22600000	54545.45455	--	µg/kg	240		1100		2100		5000		2300	

Table 4-2.1
2015 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	SW15-SLB04		SW15-SLB04		SW15-SLB05		SW15-SLB05		SW15-SLB05	
						Sample ID	SW15-SLB04-SURF_7/14/2015 2:00:00 PM		SW15-SLB04-0520_7/13/2015 3:45:00 PM		SW15-SLB05-SURF_7/8/2015 4:25:00 PM		SW15-SLB05-0520_7/9/2015 9:48:00 AM		SW15-SLB05-0520-FD_7/9/2015 9:48:00 AM	
						Parent Sample ID	--		--		--		--		SW15-SLB05-0520-FD_7/9/2015 9:48:00 AM	
						Date	07-14-2015		07-13-2015		07-08-2015		07-09-2015		07-09-2015	
						Sample Depth (ft bss)	0 - 0.5		0.5 - 2		0 - 0.5		0.5 - 2		0.5 - 2	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		FD	
Metals																
Aluminum	ISM02	77500000	100000000	600000	28721000	µg/kg	**9680000**		**11800000**		**11300000**		**9530000**		**9750000**	
Antimony	ISM02	31300	467000	542	--	µg/kg	< 9300	**UJ**	< 7400	**UJ**	510	J	< 7600	**UJ**	500	J
Arsenic	ISM02	677	3000	584	8300	µg/kg	**4700**		**4000**		**4500**		**4200**		**5300**	
Barium	ISM02	15300000	100000000	164800	364000	µg/kg	141000		85700		115000		96500		96700	
Beryllium	ISM02	156000	2300000	6320	--	µg/kg	470	J	660		520	J	430	J	450	J
Cadmium	ISM02	71100	985000	752	1070	µg/kg	< 770		< 620		520	J	530	J	640	J
Calcium	ISM02	--	--	--	14536000	µg/kg	12100000		**15900000**		**14800000**		11500000	*	**14700000**	
Chromium	ISM02	--	--	360000000	43500	µg/kg	22800	J	24000	J	25900		22900		22800	
Cobalt	ISM02	23400	347000	3607.321132	22000	µg/kg	**7400**	**J**	**8400**		**9300**	**J**	**7500**		**8100**	**J**
Copper	ISM02	3130000	46700000	91600	35400	µg/kg	15700		21600		28300		32600		**43000**	
Iron	ISM02	54800000	100000000	--	34314000	µg/kg	20700000	J	21700000	J	22300000		19600000		18800000	
Lead	ISM02	400000	800000	27000	51600	µg/kg	10800		23000		**28900**		**52200**		**31100**	
Magnesium	ISM02	--	--	--	8290000	µg/kg	**8720000**		**9420000**		**10200000**		7980000	*	**9550000**	
Manganese	ISM02	1830000	25900000	39124.42396	2937000	µg/kg	**595000**	*	**364000**	*	**575000**		**326000**	*	**359000**	
Mercury	ISM02	3130	3130	208	--	µg/kg	65	J	53	J	160	J-	130	J	70	J-
Nickel	ISM02	1550000	22500000	13061.22449	30800	µg/kg	**15900**		**18100**		**21900**		**17300**		**19200**	
Potassium	ISM02	--	--	--	--	µg/kg	1290000		1710000		1330000		1110000		1140000	
Selenium	ISM02	391000	5840000	520	--	µg/kg	**1200**	**J**	**940**	**J**	< 7000		**790**	**J**	< 6200	
Silver	ISM02	391000	5840000	849.0967056	--	µg/kg	< 1500		< 1200		< 2000		< 1300		< 1800	
Sodium	ISM02	--	--	--	--	µg/kg	323000	J	349000	J	288000	J	283000	J	279000	J
Thallium	ISM02	782	11700	284	--	µg/kg	< 3900		< 3100		< 5000	**UJ**	< 3200	**UJ**	< 4400	**UJ**
Vanadium	ISM02	393000	5840000	60000	85000	µg/kg	34400	J	34900	J	34700		34400		34700	
Zinc	ISM02	23500000	100000000	--	150000	µg/kg	65700		76400		104000		119000		135000	
AVS/SEM																
Acid volatile sulfides	AVS	--	--	--	--	µg/kg	< 31500		-		334000		148000		-	
Acid volatile sulfides	AVS_UM/G	--	--	--	--	µg/kg	< 980		-		10400		4600		-	
Acid volatile sulfides	SW6010	--	--	--	--	µg/kg	0		-		66.8		379		-	
Cadmium	SW6010	71100	985000	752	1070	µg/kg	< 2400		-		< 2600		560	J	-	
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	6800	J	-		5500	J	5600	J	-	
Lead	SW6010	400000	800000	27000	51600	µg/kg	9400		-		6800	J	**29200**	**J**	-	
Mercury	SW7470	3130	3130	208	--	µg/kg	< 9.9		-		< 11		< 8.8		-	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	8500	J	-		3400	J	5300	J	-	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	51600		-		33900	J	93200	J	-	
Cadmium	SW6010_SEM	71100	985000	752	1070	µg/kg	< 21		-		< 23		5	J	-	
Copper	SW6010_SEM	3130000	46700000	91600	35400	µg/kg	110	J	-		87	J	89	J	-	
Lead	SW6010_SEM	400000	800000	27000	51600	µg/kg	45		-		33	J	140	J	-	
Mercury	SW7470_SEM	3130	3130	208	--	µg/kg	< 0.0490		-		< 0.0550		< 0.0440		-	
Nickel	SW6010_SEM	1550000	22500000	13061.22449	30800	µg/kg	140	J	-		57	J	91	J	-	
Zinc	SW6010_SEM	23500000	100000000	--	150000	µg/kg	790		-		520	J	1400	J	-	

Table 4-2.1
2015 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	SW15-SLB04		SW15-SLB04		SW15-SLB05		SW15-SLB05		SW15-SLB05	
						Sample ID	SW15-SLB04-SURF_7/14/2015 2:00:00 PM		SW15-SLB04-0520_7/13/2015 3:45:00 PM		SW15-SLB05-SURF_7/8/2015 4:25:00 PM		SW15-SLB05-0520_7/9/2015 9:48:00 AM		SW15-SLB05-0520-FD_7/9/2015 9:48:00 AM	
						Parent Sample ID	--		--		--		--		SW15-SLB05-0520-FD_7/9/2015 9:48:00 AM	
						Date	07-14-2015		07-13-2015		07-08-2015		07-09-2015		07-09-2015	
						Sample Depth (ft bss)	0 - 0.5		0.5 - 2		0 - 0.5		0.5 - 2		0.5 - 2	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		FD	
Polychlorinated Biphenyls																
Aroclor 1016	SOM02.2	4110	28000	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Aroclor 1221	SOM02.2	213	883	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Aroclor 1232	SOM02.2	190	792	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Aroclor 1242	SOM02.2	235	972	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Aroclor 1248	SOM02.2	236	975	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Aroclor 1254	SOM02.2	239	988	--	--	µg/kg	< 69		12	J	< 74		36	J	78	J
Aroclor 1260	SOM02.2	243	1000	--	--	µg/kg	< 69		7.7	J	13	J	14	J	49	J
Aroclor 1262	SOM02.2	--	--	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Aroclor 1268	SOM02.2	--	--	--	--	µg/kg	< 69		< 48		< 74		< 62		< 59	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	0		**19.7**		**13**		**50**		**127**	
Organotins																
Dibutyltin as ion	RESTEK	--	--	--	--	µg/kg	-		-		< 2.9		< 2.4		-	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	-		-		< 47	UJ	< 38	UJ	-	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		< 3.8		< 3.1		-	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	-		-		14		23		-	
Pesticides																
4,4'-DDD	SOM02.2	1900	9570	--	--	µg/kg	-		-		9.9		27		-	
4,4'-DDE	SOM02.2	2000	9380	--	--	µg/kg	-		-		3.5	J	1.4	J	-	
4,4'-DDT	SOM02.2	1890	8530	--	--	µg/kg	-		-		11	J	1.8	J	-	
Aldrin	SOM02.2	39.7	187	--	--	µg/kg	-		-		< 4	UJ	< 3.1	UJ	-	
alpha-BHC	SOM02.2	86.1	365	--	--	µg/kg	-		-		< 4		< 3.1		-	
alpha-Chlordane	SOM02.2	--	--	--	--	µg/kg	-		-		< 4		< 3.1		-	
beta-BHC	SOM02.2	301	1280	--	--	µg/kg	-		-		< 4		< 3.1		-	
beta-Chlordane	SOM02.2	--	--	--	--	µg/kg	-		-		< 4		< 3.1		-	
delta-BHC	SOM02.2	--	--	--	--	µg/kg	-		-		< 4		< 3.1		-	
Dieldrin	SOM02.2	33.9	144	--	--	µg/kg	-		-		< 7.7		0.92	J	-	
Endosulfan I	SOM02.2	--	--	--	--	µg/kg	-		-		< 4		< 3.1		-	
Endosulfan II	SOM02.2	--	--	--	--	µg/kg	-		-		< 7.7		< 6.1		-	
Endosulfan Sulfate	SOM02.2	--	--	--	--	µg/kg	-		-		< 7.7		< 6.1		-	
Endrin	SOM02.2	19000	246000	161.6	--	µg/kg	-		-		< 7.7	UJ	< 6.1	UJ	-	
Endrin Aldehyde	SOM02.2	--	--	--	--	µg/kg	-		-		< 7.7		< 6.1		-	
Endrin Ketone	SOM02.2	--	--	--	--	µg/kg	-		-		< 7.7		< 6.1		-	
gamma-BHC (Lindane)	SOM02.2	568	2540	2.32	--	µg/kg	-		-		< 4	**UJ**	< 3.1	**UJ**	-	
Heptachlor	SOM02.2	140	654	66.2	--	µg/kg	-		-		< 4	UJ	< 3.1	UJ	-	
Heptachlor Epoxide	SOM02.2	72.2	338	8.16	--	µg/kg	-		-		< 4		0.78	J	-	
Methoxychlor	SOM02.2	316000	4100000	4320	--	µg/kg	-		-		< 40		< 31		-	
Total DDT	SOM02.2	--	--	--	--	µg/kg	-		-		24.4	J	30.2	J	-	
Toxaphene	SOM02.2	493	2090	928	--	µg/kg	-		-		< 400		< 310		-	
Other																
Moisture	D2216	--	--	--	--	%	94.4		43.7		120		80		77	
Total Solids	E160.3	--	--	--	--	%	48.6		68.7		43.4		54.4		56	
Total Organic Carbon	TOC	--	--	--	--	mg/kg	49400		27000		44200		36500	J	46900	

Table 4-2.1
2015 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	SW15-SLB05		SW15-SLB05		SW15-SLB06		SW15-SLB06		SW15-SLB06	
						Sample ID	SW15-SLB05-2040_7/9/2015 9:47:00 AM		SW15-SLB05-4060_7/9/2015 9:49:00 AM		SW15-SLB06-SURF_7/8/2015 3:38:00 PM		SW15-SLB06-0520_7/9/2015 8:40:00 AM		SW15-SLB06-0520-FD_7/9/2015 8:40:00 AM	
						Parent Sample ID	--		--		--		--		SW15-SLB06-0520-FD_7/9/2015 8:40:00 AM	
						Date	07-09-2015		07-09-2015		07-08-2015		07-09-2015		07-09-2015	
						Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.5		0.5 - 2		0.5 - 2	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	N		N		N		N		FD	
Polycyclic Aromatic Hydrocarbons																
C1-Chrysenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	1700	J	100	J	-		-		-	
C1-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	7100	J	490	J	-		-		-	
C1-Fluorenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 1100		< 82		-		-		-	
C1-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 1100		< 82		-		-		-	
C1-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	5500	J	240	J	-		-		-	
C2-Chrysenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	1500	J	120	J	-		-		-	
C2-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	2600	J	210	J	-		-		-	
C2-Fluorenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 1100		< 82		-		-		-	
C2-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 1100		110	J	-		-		-	
C2-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	2600	J	220	J	-		-		-	
C3-Chrysenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 1100		< 82		-		-		-	
C3-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	1600	J	130	J	-		-		-	
C3-Fluorenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 1100		< 82		-		-		-	
C3-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	1200	J	170	J	-		-		-	
C3-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	2200	J	280	J	-		-		-	
C4-Chrysenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 1100		86	J	-		-		-	
C4-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 1100		99	J	-		-		-	
C4-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	1300	J	210	J	-		-		-	
1-Methylnaphthalene	SOM02.2/SV SIM	17600	72700	--	--	µg/kg	< 1100		< 82		-		-		-	
2-Methylnaphthalene	SOM02.2/SV SIM	239000	3010000	--	--	µg/kg	170	J	27	J	69	J	120	J	-	
Acenaphthene	SOM02.2/SV SIM	3590000	45200000	--	--	µg/kg	430	J	68	J	140		200	J	-	
Acenaphthylene	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 1100		< 82		23	J	27	J	-	
Anthracene	SOM02.2/SV SIM	17900000	100000000	196949.1525	--	µg/kg	2000		110		190		350		-	
Benzo (a) anthracene	SOM02.2/SV SIM	1140	20800	--	--	µg/kg	**4100**		260		370		730		-	
Benzo (a) pyrene	SOM02.2/SV SIM	115	2110	470	--	µg/kg	**2400**		**170**		**310**		**600**		-	
Benzo (b) fluoranthene	SOM02.2/SV SIM	1150	21100	478.0876494	--	µg/kg	**2100**		220		420		**650**		-	
Benzo (ghi) perylene	SOM02.2/SV SIM	--	--	--	--	µg/kg	1200		87		130	J	250		-	
Benzo (k) fluoranthene	SOM02.2/SV SIM	11500	211000	--	--	µg/kg	2500		180		330		640		-	
Benzo(e)pyrene	SOM02.2/SV SIM	--	--	--	--	µg/kg	1600		140		-		-		-	
Chrysene	SOM02.2/SV SIM	115000	2110000	144.2231076	--	µg/kg	**3500**		**260**		**530**		**940**		-	
Dibenz (a,h) anthracene	SOM02.2/SV SIM	115	2110	--	--	µg/kg	**380**	**J**	35	J	49	J	98	J	-	
Fluoranthene	SOM02.2/SV SIM	2390000	30100000	88877.80549	--	µg/kg	8100		870		1400		2300		-	
Fluorene	SOM02.2/SV SIM	2390000	30100000	14829.93197	--	µg/kg	630	J	72	J	240		350		-	
Indeno (1,2,3-cd) pyrene	SOM02.2/SV SIM	1150	21100	--	--	µg/kg	**1200**		82		140		270		-	
Naphthalene	SOM02.2/SV SIM	5520	24100	658.1818182	--	µg/kg	230	J	35	J	90	J	150	J	-	
Perylene	SOM02.2/SV SIM	--	--	--	--	µg/kg	< 1100		< 82		-		-		-	
Phenanthrene	SOM02.2/SV SIM	--	--	--	--	µg/kg	5200		560		510		1300		-	
Pyrene	SOM02.2/SV SIM	1790000	22600000	54545.45455	--	µg/kg	5700		560		900		1500		-	

Table 4-2.1
2015 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	SW15-SLB05		SW15-SLB05		SW15-SLB06		SW15-SLB06		SW15-SLB06	
						Sample ID	SW15-SLB05-2040_7/9/2015 9:47:00 AM		SW15-SLB05-4060_7/9/2015 9:49:00 AM		SW15-SLB06-SURF_7/8/2015 3:38:00 PM		SW15-SLB06-0520_7/9/2015 8:40:00 AM		SW15-SLB06-0520-FD_7/9/2015 8:40:00 AM	
						Parent Sample ID	--		--		--		--		SW15-SLB06-0520-FD_7/9/2015 8:40:00 AM	
						Date	07-09-2015		07-09-2015		07-08-2015		07-09-2015		07-09-2015	
						Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.5		0.5 - 2		0.5 - 2	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	N		N		N		N		FD	
Metals																
Aluminum	ISM02	77500000	100000000	600000	28721000	µg/kg	**7510000**		**3270000**		**16700000**		**13600000**		-	
Antimony	ISM02	31300	467000	542	--	µg/kg	520	J	< 5700		< 13700		490	J	-	
Arsenic	ISM02	677	3000	584	8300	µg/kg	**4400**		**1900**		**5400**		**5700**		-	
Barium	ISM02	15300000	100000000	164800	364000	µg/kg	65900		26400		**218000**		149000		-	
Beryllium	ISM02	156000	2300000	6320	--	µg/kg	400	J	170	J	740	J	640	J	-	
Cadmium	ISM02	71100	985000	752	1070	µg/kg	730	J	280	J	710	J	**1100**	**J+**	-	
Calcium	ISM02	--	--	--	14536000	µg/kg	14400000		**24100000**		14400000		**17700000**		-	
Chromium	ISM02	--	--	360000000	43500	µg/kg	19500		7000		37400		33300		-	
Cobalt	ISM02	23400	347000	3607.321132	22000	µg/kg	**6600**	**J**	3300	J	**12000**		**11000**		-	
Copper	ISM02	3130000	46700000	91600	35400	µg/kg	**42900**		7700		**43700**		**59700**		-	
Iron	ISM02	54800000	100000000	--	34314000	µg/kg	16100000		7300000		32500000		24800000		-	
Lead	ISM02	400000	800000	27000	51600	µg/kg	**50900**		4000		**27200**		**51100**		-	
Magnesium	ISM02	--	--	--	8290000	µg/kg	**8370000**		**9270000**		**12000000**		**12100000**		-	
Manganese	ISM02	1830000	25900000	39124.42396	2937000	µg/kg	**255000**		**218000**		**629000**		**463000**		-	
Mercury	ISM02	3130	3130	208	--	µg/kg	200		< 120	UJ	95	J-	< 210	**UJ**	-	
Nickel	ISM02	1550000	22500000	13061.22449	30800	µg/kg	**16700**		8500		**29400**		**27100**		-	
Potassium	ISM02	--	--	--	--	µg/kg	906000		412000	J	2100000		1580000		-	
Selenium	ISM02	391000	5840000	520	--	µg/kg	< 5300		< 3300		**1300**	**J**	< 6600		-	
Silver	ISM02	391000	5840000	849.0967056	--	µg/kg	140	J	< 960		< 2300		270	J	-	
Sodium	ISM02	--	--	--	--	µg/kg	214000	J	154000	J	372000	J	319000	J	-	
Thallium	ISM02	782	11700	284	--	µg/kg	< 3800	**UJ**	< 2400	**UJ**	< 5700	**UJ**	< 4700	**UJ**	-	
Vanadium	ISM02	393000	5840000	60000	85000	µg/kg	27500		16000		47000		38100		-	
Zinc	ISM02	23500000	100000000	--	150000	µg/kg	**175000**		26500		136000		**203000**		-	
AVS/SEM																
Acid volatile sulfides	AVS	--	--	--	--	µg/kg	-		-		156000		-		-	
Acid volatile sulfides	AVS_UM/G	--	--	--	--	µg/kg	-		-		4900		-		-	
Acid volatile sulfides	SW6010	--	--	--	--	µg/kg	-		-		312		-		-	
Cadmium	SW6010	71100	985000	752	1070	µg/kg	-		-		< 3300		-		-	
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	-		-		7100	J	-		-	
Lead	SW6010	400000	800000	27000	51600	µg/kg	-		-		18800	J	-		-	
Mercury	SW7470	3130	3130	208	--	µg/kg	-		-		< 14		-		-	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	-		-		6400	J	-		-	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	-		-		78800	J	-		-	
Cadmium	SW6010_SEM	71100	985000	752	1070	µg/kg	-		-		< 30		-		-	
Copper	SW6010_SEM	3130000	46700000	91600	35400	µg/kg	-		-		110	J	-		-	
Lead	SW6010_SEM	400000	800000	27000	51600	µg/kg	-		-		91	J	-		-	
Mercury	SW7470_SEM	3130	3130	208	--	µg/kg	-		-		< 0.0690		-		-	
Nickel	SW6010_SEM	1550000	22500000	13061.22449	30800	µg/kg	-		-		110	J	-		-	
Zinc	SW6010_SEM	23500000	100000000	--	150000	µg/kg	-		-		1200	J	-		-	

Table 4-2.1
2015 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	SW15-SLB05		SW15-SLB05		SW15-SLB06		SW15-SLB06		SW15-SLB06	
						Sample ID	SW15-SLB05-2040_7/9/2015 9:47:00 AM		SW15-SLB05-4060_7/9/2015 9:49:00 AM		SW15-SLB06-SURF_7/8/2015 3:38:00 PM		SW15-SLB06-0520_7/9/2015 8:40:00 AM		SW15-SLB06-0520-FD_7/9/2015 8:40:00 AM	
						Parent Sample ID	--		--		--		--		SW15-SLB06-0520-FD_7/9/2015 8:40:00 AM	
						Date	07-09-2015		07-09-2015		07-08-2015		07-09-2015		07-09-2015	
						Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.5		0.5 - 2		0.5 - 2	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	**N**		**N**		**N**		**N**		**FD**	
Polychlorinated Biphenyls																
Aroclor 1016	SOM02.2	4110	28000	--	--	µg/kg	< 56		-		< 56		< 71		-	
Aroclor 1221	SOM02.2	213	883	--	--	µg/kg	< 56		-		< 56		< 71		-	
Aroclor 1232	SOM02.2	190	792	--	--	µg/kg	< 56		-		< 56		< 71		-	
Aroclor 1242	SOM02.2	235	972	--	--	µg/kg	< 56		-		< 56		< 71		-	
Aroclor 1248	SOM02.2	236	975	--	--	µg/kg	< 56		-		< 56		< 71		-	
Aroclor 1254	SOM02.2	239	988	--	--	µg/kg	140	J	-		< 56		< 71		-	
Aroclor 1260	SOM02.2	243	1000	--	--	µg/kg	58		-		17	J	30	J	-	
Aroclor 1262	SOM02.2	--	--	--	--	µg/kg	< 56		-		< 56		< 71		-	
Aroclor 1268	SOM02.2	--	--	--	--	µg/kg	< 56		-		< 56		< 71		-	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	**198**		-		**17**		**30**		-	
Organotins																
Dibutyltin as ion	RESTEK	--	--	--	--	µg/kg	-		-		-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	-		-		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		-		-		-	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	-		-		-		-		-	
Pesticides																
4,4'-DDD	SOM02.2	1900	9570	--	--	µg/kg	-		-		110		81		87	
4,4'-DDE	SOM02.2	2000	9380	--	--	µg/kg	-		-		5.5	J	< 72		4.6	J
4,4'-DDT	SOM02.2	1890	8530	--	--	µg/kg	-		-		5.7	J	190	J	4.7	J
Aldrin	SOM02.2	39.7	187	--	--	µg/kg	-		-		< 4.9	UJ	< 37	UJ	< 3.3	UJ
alpha-BHC	SOM02.2	86.1	365	--	--	µg/kg	-		-		< 4.9		< 37		< 3.3	
alpha-Chlordane	SOM02.2	--	--	--	--	µg/kg	-		-		< 4.9		< 37		< 3.3	
beta-BHC	SOM02.2	301	1280	--	--	µg/kg	-		-		< 4.9		< 37		0.62	J
beta-Chlordane	SOM02.2	--	--	--	--	µg/kg	-		-		< 4.9		< 37		< 3.3	
delta-BHC	SOM02.2	--	--	--	--	µg/kg	-		-		< 4.9		< 37		< 3.3	
Dieldrin	SOM02.2	33.9	144	--	--	µg/kg	-		-		< 9.4		**< 72**		1.2	J
Endosulfan I	SOM02.2	--	--	--	--	µg/kg	-		-		< 4.9		< 37		< 3.3	
Endosulfan II	SOM02.2	--	--	--	--	µg/kg	-		-		< 9.4		< 72		< 6.3	
Endosulfan Sulfate	SOM02.2	--	--	--	--	µg/kg	-		-		< 9.4		< 72		1.3	J
Endrin	SOM02.2	19000	246000	161.6	--	µg/kg	-		-		< 9.4	UJ	< 72	UJ	< 6.3	UJ
Endrin Aldehyde	SOM02.2	--	--	--	--	µg/kg	-		-		< 9.4		< 72		< 6.3	
Endrin Ketone	SOM02.2	--	--	--	--	µg/kg	-		-		< 9.4		< 72		1.3	J
gamma-BHC (Lindane)	SOM02.2	568	2540	2.32	--	µg/kg	-		-		**< 4.9**	**UJ**	**< 37**	**UJ**	**< 3.3**	**UJ**
Heptachlor	SOM02.2	140	654	66.2	--	µg/kg	-		-		< 4.9	UJ	< 37	UJ	< 3.3	UJ
Heptachlor Epoxide	SOM02.2	72.2	338	8.16	--	µg/kg	-		-		< 4.9		**< 37**		1.2	J
Methoxychlor	SOM02.2	316000	4100000	4320	--	µg/kg	-		-		< 49		< 370		< 33	
Total DDT	SOM02.2	--	--	--	--	µg/kg	-		-		121.2	J	271	J	96.3	J
Toxaphene	SOM02.2	493	2090	928	--	µg/kg	-		-		< 490		**< 3700**		< 330	
Other																
Moisture	D2216	--	--	--	--	%	76		28		190		120		-	
Total Solids	E160.3	--	--	--	--	%	57.8		78.7		34.8		45.3		51.8	
Total Organic Carbon	TOC	--	--	--	--	mg/kg	44500		5830		100000		64600		-	

Table 4-2.1
2015 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	**SW15-SLB06**		**SW15-SLB06**		**SW15-SLB07**	
						Sample ID	**SW15-SLB06-2040_7/9/2015 8:38:00 AM**		**SW15-SLB06-4060_7/9/2015 8:42:00 AM**		**SW15-SLB07-SURF_7/8/2015 2:40:00 PM**	
						Parent Sample ID	**--**		**--**		**--**	
						Date	**07-09-2015**		**07-09-2015**		**07-08-2015**	
						Sample Depth (ft bss)	**2 - 4**		**4 - 6**		**0 - 0.5**	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	**N**		**N**		**N**	
Polycyclic Aromatic Hydrocarbons												
C1-Chrysenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C1-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C1-Fluorenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C1-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C1-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C2-Chrysenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C2-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C2-Fluorenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C2-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C2-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C3-Chrysenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C3-Fluoranthenes/Pyrenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C3-Fluorenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C3-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C3-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C4-Chrysenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C4-Naphthalenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
C4-Phenanthrenes/Anthracenes	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
1-Methylnaphthalene	SOM02.2/SV SIM	17600	72700	--	--	µg/kg	-		-		-	
2-Methylnaphthalene	SOM02.2/SV SIM	239000	3010000	--	--	µg/kg	490	J	1400		64	J
Acenaphthene	SOM02.2/SV SIM	3590000	45200000	--	--	µg/kg	820		4800		260	
Acenaphthylene	SOM02.2/SV SIM	--	--	--	--	µg/kg	63	J	120	J	< 110	
Anthracene	SOM02.2/SV SIM	17900000	100000000	196949.1525	--	µg/kg	1400		1700		290	
Benzo (a) anthracene	SOM02.2/SV SIM	1140	20800	--	--	µg/kg	**2700**		**2300**		380	
Benzo (a) pyrene	SOM02.2/SV SIM	115	2110	470	--	µg/kg	**2000**		**2000**		**310**	
Benzo (b) fluoranthene	SOM02.2/SV SIM	1150	21100	478.0876494	--	µg/kg	**2000**		**1700**		330	
Benzo (ghi) perylene	SOM02.2/SV SIM	--	--	--	--	µg/kg	1000		710		120	
Benzo (k) fluoranthene	SOM02.2/SV SIM	11500	211000	--	--	µg/kg	2200		1900		350	
Benzo(e)pyrene	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
Chrysene	SOM02.2/SV SIM	115000	2110000	144.2231076	--	µg/kg	**2900**		**2600**		**470**	
Dibenz (a,h) anthracene	SOM02.2/SV SIM	115	2110	--	--	µg/kg	**400**	**J**	**280**	**J**	54	J
Fluoranthene	SOM02.2/SV SIM	2390000	30100000	88877.80549	--	µg/kg	7800		6600		1400	
Fluorene	SOM02.2/SV SIM	2390000	30100000	14829.93197	--	µg/kg	1000		3200		400	
Indeno (1,2,3-cd) pyrene	SOM02.2/SV SIM	1150	21100	--	--	µg/kg	1100		750		150	
Naphthalene	SOM02.2/SV SIM	5520	24100	658.1818182	--	µg/kg	600		**2100**		180	
Perylene	SOM02.2/SV SIM	--	--	--	--	µg/kg	-		-		-	
Phenanthrene	SOM02.2/SV SIM	--	--	--	--	µg/kg	6400		8800		1400	
Pyrene	SOM02.2/SV SIM	1790000	22600000	54545.45455	--	µg/kg	5600		5000		920	

Table 4-2.1
2015 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	SW15-SLB06		SW15-SLB06		SW15-SLB07	
						Sample ID	SW15-SLB06-2040_7/9/2015 8:38:00 AM		SW15-SLB06-4060_7/9/2015 8:42:00 AM		SW15-SLB07-SURF_7/8/2015 2:40:00 PM	
						Parent Sample ID	--		--		--	
						Date	07-09-2015		07-09-2015		07-08-2015	
						Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.5	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	**N**		**N**		**N**	
Metals												
Aluminum	ISM02	77500000	100000000	600000	28721000	µg/kg	**10900000**		**9100000**		**8500000**	
Antimony	ISM02	31300	467000	542	--	µg/kg	**750**	**J**	**2200**	**J**	< 7100	
Arsenic	ISM02	677	3000	584	8300	µg/kg	**5000**		**6000**		**3400**	
Barium	ISM02	15300000	100000000	164800	364000	µg/kg	98300		103000		67500	
Beryllium	ISM02	156000	2300000	6320	--	µg/kg	560	J	550	J	380	J
Cadmium	ISM02	71100	985000	752	1070	µg/kg	**1000**	**J+**	**1400**	**J+**	350	J
Calcium	ISM02	--	--	--	14536000	µg/kg	**15800000**		13500000		11600000	
Chromium	ISM02	--	--	360000000	43500	µg/kg	26400		23700		19700	
Cobalt	ISM02	23400	347000	3607.321132	22000	µg/kg	**8900**		**8100**		**7200**	
Copper	ISM02	3130000	46700000	91600	35400	µg/kg	**58000**		**85800**		17900	
Iron	ISM02	54800000	100000000	--	34314000	µg/kg	21800000		22400000		17500000	
Lead	ISM02	400000	800000	27000	51600	µg/kg	**72500**		**115000**		14200	
Magnesium	ISM02	--	--	--	8290000	µg/kg	**10400000**		**8810000**		6950000	
Manganese	ISM02	1830000	25900000	39124.42396	2937000	µg/kg	**337000**		**290000**		**571000**	
Mercury	ISM02	3130	3130	208	--	µg/kg	**340**		**450**		< 160	UJ
Nickel	ISM02	1550000	22500000	13061.22449	30800	µg/kg	**21700**		**19900**		**17100**	
Potassium	ISM02	--	--	--	--	µg/kg	1270000		1100000		904000	
Selenium	ISM02	391000	5840000	520	--	µg/kg	**1000**	**J**	**1100**	**J**	< 4100	
Silver	ISM02	391000	5840000	849.0967056	--	µg/kg	290	J	260	J	< 1200	
Sodium	ISM02	--	--	--	--	µg/kg	266000	J	239000	J	391000	J
Thallium	ISM02	782	11700	284	--	µg/kg	< 3500	**UJ**	< 4000	**UJ**	< 2900	**UJ**
Vanadium	ISM02	393000	5840000	60000	85000	µg/kg	34400		31200		29200	
Zinc	ISM02	23500000	100000000	--	150000	µg/kg	**221000**		**408000**		56500	
AVS/SEM												
Acid volatile sulfides	AVS	--	--	--	--	µg/kg	-		-		< 26400	
Acid volatile sulfides	AVS_UM/G	--	--	--	--	µg/kg	-		-		< 820	
Acid volatile sulfides	SW6010	--	--	--	--	µg/kg	-		-		0	
Cadmium	SW6010	71100	985000	752	1070	µg/kg	-		-		< 2000	
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	-		-		5000	J
Lead	SW6010	400000	800000	27000	51600	µg/kg	-		-		8200	J
Mercury	SW7470	3130	3130	208	--	µg/kg	-		-		< 8.3	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	-		-		3800	J
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	-		-		32800	J
Cadmium	SW6010_SEM	71100	985000	752	1070	µg/kg	-		-		< 18	
Copper	SW6010_SEM	3130000	46700000	91600	35400	µg/kg	-		-		79	J
Lead	SW6010_SEM	400000	800000	27000	51600	µg/kg	-		-		39	J
Mercury	SW7470_SEM	3130	3130	208	--	µg/kg	-		-		< 0.0410	
Nickel	SW6010_SEM	1550000	22500000	13061.22449	30800	µg/kg	-		-		64	J
Zinc	SW6010_SEM	23500000	100000000	--	150000	µg/kg	-		-		500	J

Table 4-2.1
2015 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	SW15-SLB06		SW15-SLB06		SW15-SLB07	
						Sample ID	SW15-SLB06-2040_7/9/2015 8:38:00 AM		SW15-SLB06-4060_7/9/2015 8:42:00 AM		SW15-SLB07-SURF_7/8/2015 2:40:00 PM	
						Parent Sample ID	--		--		--	
						Date	07-09-2015		07-09-2015		07-08-2015	
						Sample Depth (ft bss)	2 - 4		4 - 6		0 - 0.5	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N	
Polychlorinated Biphenyls												
Aroclor 1016	SOM02.2	4110	28000	--	--	µg/kg	< 57		-		< 57	
Aroclor 1221	SOM02.2	213	883	--	--	µg/kg	< 57		-		< 57	
Aroclor 1232	SOM02.2	190	792	--	--	µg/kg	< 57		-		< 57	
Aroclor 1242	SOM02.2	235	972	--	--	µg/kg	< 57		-		< 57	
Aroclor 1248	SOM02.2	236	975	--	--	µg/kg	< 57		-		< 57	
Aroclor 1254	SOM02.2	239	988	--	--	µg/kg	< 57		-		< 57	
Aroclor 1260	SOM02.2	243	1000	--	--	µg/kg	40	J	-		6	J
Aroclor 1262	SOM02.2	--	--	--	--	µg/kg	< 57		-		< 57	
Aroclor 1268	SOM02.2	--	--	--	--	µg/kg	< 57		-		< 57	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	**40**		-		6	
Organotins												
Dibutyltin as ion	RESTEK	--	--	--	--	µg/kg	-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		-	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	-		-		-	
Pesticides												
4,4'-DDD	SOM02.2	1900	9570	--	--	µg/kg	-		-		1.1	J
4,4'-DDE	SOM02.2	2000	9380	--	--	µg/kg	-		-		< 5.8	
4,4'-DDT	SOM02.2	1890	8530	--	--	µg/kg	-		-		0.61	J
Aldrin	SOM02.2	39.7	187	--	--	µg/kg	-		-		< 3	UJ
alpha-BHC	SOM02.2	86.1	365	--	--	µg/kg	-		-		< 3	
alpha-Chlordane	SOM02.2	--	--	--	--	µg/kg	-		-		< 3	
beta-BHC	SOM02.2	301	1280	--	--	µg/kg	-		-		< 3	
beta-Chlordane	SOM02.2	--	--	--	--	µg/kg	-		-		< 3	
delta-BHC	SOM02.2	--	--	--	--	µg/kg	-		-		< 3	
Dieldrin	SOM02.2	33.9	144	--	--	µg/kg	-		-		< 5.8	
Endosulfan I	SOM02.2	--	--	--	--	µg/kg	-		-		< 3	
Endosulfan II	SOM02.2	--	--	--	--	µg/kg	-		-		< 5.8	
Endosulfan Sulfate	SOM02.2	--	--	--	--	µg/kg	-		-		< 5.8	
Endrin	SOM02.2	19000	246000	161.6	--	µg/kg	-		-		< 5.8	UJ
Endrin Aldehyde	SOM02.2	--	--	--	--	µg/kg	-		-		< 5.8	
Endrin Ketone	SOM02.2	--	--	--	--	µg/kg	-		-		< 5.8	
gamma-BHC (Lindane)	SOM02.2	568	2540	2.32	--	µg/kg	-		-		< 3	**UJ**
Heptachlor	SOM02.2	140	654	66.2	--	µg/kg	-		-		< 3	UJ
Heptachlor Epoxide	SOM02.2	72.2	338	8.16	--	µg/kg	-		-		< 3	
Methoxychlor	SOM02.2	316000	4100000	4320	--	µg/kg	-		-		< 30	
Total DDT	SOM02.2	--	--	--	--	µg/kg	-		-		1.71	J
Toxaphene	SOM02.2	493	2090	928	--	µg/kg	-		-		< 300	
Other												
Moisture	D2216	--	--	--	--	%	79		90		74	
Total Solids	E160.3	--	--	--	--	%	56.4		53.5		57.8	
Total Organic Carbon	TOC	--	--	--	--	mg/kg	60000		68400		24500	

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Table 4-2.1
2015 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

Footnotes:
< : Denotes concentration less than indicated detection limit
WDNR = Wisconsin Department of Natural Resources
RCL = Residual Contaminent Level
Values are shaded based on the highest comparison criteria exceeded.
Exceeds WDNR-SO-NON-IND-RCL = The Non-Industrial Soil Direct Contact RCL (Wis. Admin. Code NR 720)
Exceeds WDNR-SO-IND-RCL = The Industrial Soil Direct Contact RCL (Wis. Admin. Code NR 720)
Exceeds WDNR-SO-GW-RCL = The Soil-to-Groundwater RCL (Wis. Admin. Code NR 720)
Exceeds WDNR-SO-BKG = The Soil Background RCL (Wis. Admin. Code NR 720)
ND = Non Detect
N = Sample type is a normal sample.
FD = Sample type is a field duplicate sample.
"-" = Not analyzed
"--" = No Standard/Guideline
PCB = Polychlorinated Biphenyls
µg/kg = microgram per kilogram
mg/kg = milligrams per kilograms
ft bss = feet below sediment surface
% = percent
AVS = Acid Volatile Sulfide
SEM = Simultaneously Extractable Metals
* = Post-digestion spike at 2 times the parent concentration.
J = Indicates that the concentration was detected above the method detection limit but below the reporting limit. The concentration is an estimated value.
J+ = Result is estimated but biased high.
J- = Result is estimated but biased low.
UJ = Analyte is not detected above the reported limit and the limit is estimated.

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM01		ND20-GM01		ND20-GM01		ND20-GM02		ND20-GM02		ND20-GM02	
						Sample ID	ND20-GM01-SURF_06/28/2020		ND20-GM01-0320_07/02/2020		ND20-GM01-2040_07/02/2020		ND20-GM02-SURF_07/01/2020		ND20-GM02-0320_07/02/2020		ND20-GM02-2040_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	06-28-2020		07-02-2020		07-02-2020		07-01-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		0 - 0.3		0.3 - 2		2 - 4	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	N		N		N		N		N		N	
Metals																		
Aluminum	SW6010	77500000	100000000	600000	28721000	µg/kg	**15800000**		**12500000**		**9310000**		**18800000**		**13000000**		**11700000**	
Antimony	SW6010	31300	467000	542	--	µg/kg	< 13000		< 10200		**1000**	**J**	< 14000		**1200**	**J**	**720**	**J**
Arsenic	SW6010	677	3000	584	8300	µg/kg	**6000**		**5900**		**6500**		**6200**		**7000**		**4900**	
Barium	SW6010	15300000	100000000	164800	364000	µg/kg	**217000**	*****	142000		89100		**209000**		158000		93500	
Beryllium	SW6010	156000	2300000	6320	--	µg/kg	610	J	610	J	550	J	810	J	670	J	550	J
Cadmium	SW6010	71100	985000	752	1070	µg/kg	620	J	740	J	**1000**		610	J	**990**		**850**	
Calcium Metal	SW6010	--	--	--	14536000	µg/kg	10500000	*	11100000		14200000		11900000		12800000		12900000	
Chromium	SW6010	--	--	360000000	43500	µg/kg	35300	J	33400		22000		40700		32900		27200	
Cobalt	SW6010	23400	347000	3607.321132	22000	µg/kg	**11200**		**9400**		**7200**	**J**	**12500**		**10500**		**8300**	
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	**48500**		**62900**		**106000**		**46400**		**64500**		**53200**	
Iron	SW6010	54800000	100000000	--	34314000	µg/kg	30600000		25100000		20000000		**36000000**		30300000		22400000	
Lead	SW6010	400000	800000	27000	51600	µg/kg	**32600**		**64300**		**90700**		**29800**	*****	**78800**		**61200**	
Magnesium	SW6010	--	--	--	8290000	µg/kg	**9720000**	*****	**8430000**		7750000		**10900000**		**9400000**		**8950000**	
Manganese	SW6010	1830000	25900000	39124.42396	2937000	µg/kg	**516000**		**363000**	*****	**273000**	*****	**708000**		**410000**	*****	**304000**	*****
Mercury	SW6010	3130	3130	208	--	µg/kg	130	J	< 220		**410**		< 270		**310**		< 180	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	**28600**	**J**	**24000**		**18800**		**32200**		**26400**		**22300**	
Potassium	SW6010	--	--	--	--	µg/kg	2030000		1670000		1210000		2550000		1680000		1530000	
Selenium	SW6010	391000	5840000	520	--	µg/kg	**1700**	**J**	**1200**	**J**	< 5700		**2000**	**J**	**1400**	**J**	**910**	**J**
Silver	SW6010	391000	5840000	849.0967056	--	µg/kg	< 2200		160	J	< 1600		< 2300		250	J	200	J
Sodium	SW6010	--	--	--	--	µg/kg	324000	J	313000	J	288000	J	383000	J	331000	J	300000	J
Thallium	SW6010	782	11700	284	--	µg/kg	< 5400		< 4200		< 4100		< 6400		< 3800		< 3100	
Vanadium	SW6010	393000	5840000	60000	85000	µg/kg	41900		38500		35400		51300		41000		38400	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	139000	*	**174000**		**243000**		140000		**209000**		**214000**	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	4110	28000	--	--	µg/kg	< 100		< 78		< 65		< 95		-		-	
Aroclor 1221	SW8081	213	883	--	--	µg/kg	< 100		< 78		< 65		< 95		-		-	
Aroclor 1232	SW8081	190	792	--	--	µg/kg	< 100		< 78		< 65		< 95		-		-	
Aroclor 1242	SW8081	235	972	--	--	µg/kg	< 100		< 78		< 65		< 95		-		-	
Aroclor 1248	SW8081	236	975	--	--	µg/kg	< 100		< 78		< 65		< 95		-		-	
Aroclor 1254	SW8081	239	988	--	--	µg/kg	< 100		< 78		< 65		< 95		-		-	
Aroclor 1260	SW8081	243	1000	--	--	µg/kg	32	J	< 78		< 65		< 95		-		-	
Aroclor 1262	SW8081	--	--	--	--	µg/kg	< 100		40	J	20	J	33	J	-		-	
Aroclor 1268	SW8081	--	--	--	--	µg/kg	< 100		< 78		< 65		< 95		-		-	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	**32**		**40**		**20**		**33**		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM01		ND20-GM01		ND20-GM01		ND20-GM02		ND20-GM02		ND20-GM02	
						Sample ID	ND20-GM01-SURF_06/28/2020		ND20-GM01-0320_07/02/2020		ND20-GM01-2040_07/02/2020		ND20-GM02-SURF_07/01/2020		ND20-GM02-0320_07/02/2020		ND20-GM02-2040_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	06-28-2020		07-02-2020		07-02-2020		07-01-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	640000	640000	140.2	--	µg/kg	-		-		-		< 15		-		-	
1,1,2,2-Tetrachloroethane	SW8260	810	3600	0.156406869	--	µg/kg	-		-		-		< 15		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	910000	910000	--	--	µg/kg	-		-		-		< 15		-		-	
1,1,2-Trichloroethane	SW8260	1590	7010	3.24	--	µg/kg	-		-		-		< 15		-		-	
1,1-Dichloroethane	SW8260	5060	22200	483.4181818	--	µg/kg	-		-		-		< 15		-		-	
1,1-Dichloroethene	SW8260	320000	1190000	5.02	--	µg/kg	-		-		-		< 15		-		-	
1,2,4-Trichlorobenzene	SW8260	24000	113000	408	--	µg/kg	-		-		-		< 15		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	7.5	92.3	0.1728	--	µg/kg	-		-		-		< 15		-		-	
1,2-Dibromoethane	SW8260	50	221	0.0282	--	µg/kg	-		-		-		< 15		-		-	
1,2-Dichlorobenzene	SW8260	376000	376000	1168	--	µg/kg	-		-		-		< 15		-		-	
1,2-Dichloroethane	SW8260	652	2870	2.84	--	µg/kg	-		-		-		< 15	UJ	-		-	
1,2-Dichloropropane	SW8260	3400	15000	3.32	--	µg/kg	-		-		-		< 15		-		-	
1,4-Dichlorobenzene	SW8260	3740	16400	144	--	µg/kg	-		-		-		< 15		-		-	
2-Butanone	SW8260	28400000	28400000	1666.068223	--	µg/kg	-		-		-		7.7	J	-		-	
2-Hexanone	SW8260	237000	1760000	--	--	µg/kg	-		-		-		< 15		-		-	
4-Methyl-2-pentanone	SW8260	3360000	3360000	225.2396166	--	µg/kg	-		-		-		< 15		-		-	
Acetone	SW8260	63400000	100000000	3676.595745	--	µg/kg	-		-		-		370	J	-		-	
Benzene	SW8260	1600	7070	5.12	--	µg/kg	-		-		-		< 15		-		-	
Bromodichloromethane	SW8260	418	1830	0.3255	--	µg/kg	-		-		-		< 15		-		-	
Bromoform	SW8260	25400	113000	2.332	--	µg/kg	-		-		-		< 15		-		-	
Bromomethane	SW8260	9600	43000	5.059602649	--	µg/kg	-		-		-		< 15	UJ	-		-	
Carbon Disulfide	SW8260	738000	738000	591.8618989	--	µg/kg	-		-		-		< 15		-		-	
Carbon Tetrachloride	SW8260	916	4030	3.88	--	µg/kg	-		-		-		< 15		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	126000	530000	3086.294416	--	µg/kg	-		-		-		< 15		-		-	
Chlorobenzene	SW8260	370000	761000	135.8	--	µg/kg	-		-		-		< 15		-		-	
Chloroethane	SW8260	2120000	2120000	226.6028708	--	µg/kg	-		-		-		< 15	UJ	-		-	
Chloroform	SW8260	454	1980	3.33	--	µg/kg	-		-		-		< 15		-		-	
Chloromethane	SW8260	159000	669000	15.5106383	--	µg/kg	-		-		-		< 15		-		-	
cis-1,2-Dichloroethene	SW8260	156000	2340000	41.2	--	µg/kg	-		-		-		< 15		-		-	
cis-1,3-Dichloropropene	SW8260	1210000	1210000	--	--	µg/kg	-		-		-		< 15		-		-	
Cyclohexane	SW8260	117000	117000	--	--	µg/kg	-		-		-		< 15		-		-	
Dibromochloromethane	SW8260	8280	38900	31.95	--	µg/kg	-		-		-		< 15		-		-	
Ethylbenzene	SW8260	8020	35400	1570	--	µg/kg	-		-		-		< 15		-		-	
Isopropylbenzene	SW8260	268000	268000	--	--	µg/kg	-		-		-		< 15		-		-	
M-Dichlorobenzene	SW8260	297000	297000	1152.77434	--	µg/kg	-		-		-		< 15		-		-	
Methyl Acetate	SW8260	29000000	29000000	--	--	µg/kg	-		-		-		< 77		-		-	
Methyl tert-Butyl Ether	SW8260	63800	282000	27.02097902	--	µg/kg	-		-		-		< 15		-		-	
Methylcyclohexane	SW8260	67600	67600	--	--	µg/kg	-		-		-		< 15		-		-	
Methylene Chloride	SW8260	61800	1150000	2.56	--	µg/kg	-		-		-		< 15		-		-	
Styrene	SW8260	867000	867000	220	--	µg/kg	-		-		-		< 15		-		-	
Tetrachloroethene	SW8260	33000	145000	4.54	--	µg/kg	-		-		-		< 15		-		-	
Toluene	SW8260	818000	818000	1107.2	--	µg/kg	-		-		-		< 15		-		-	
trans-1,2-Dichloroethene	SW8260	1560000	1850000	62.6	--	µg/kg	-		-		-		< 15		-		-	
trans-1,3-Dichloropropene	SW8260	1510000	1510000	--	--	µg/kg	-		-		-		< 15		-		-	
Trichloroethene	SW8260	1300	8410	3.58	--	µg/kg	-		-		-		< 15		-		-	
Trichlorofluoromethane	SW8260	1230000	1230000	4477.48062	--	µg/kg	-		-		-		< 15	UJ	-		-	
Vinyl Chloride	SW8260	66.8	2080	0.138	--	µg/kg	-		-		-		< 15		-		-	
m,p-Xylene	SW8260	--	--	--	--	µg/kg	-		-		-		< 15		-		-	
o-Xylene	SW8260	434000	434000	--	--	µg/kg	-		-		-		< 15		-		-	
Xylenes (total)	SW8260	260000	260000	3960	--	µg/kg	-		-		-		< 31		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units												
						Location	ND20-GM01		ND20-GM01		ND20-GM01		ND20-GM02		ND20-GM02		ND20-GM02	
						Sample ID	ND20-GM01-SURF_06/28/2020		ND20-GM01-0320_07/02/2020		ND20-GM01-2040_07/02/2020		ND20-GM02-SURF_07/01/2020		ND20-GM02-0320_07/02/2020		ND20-GM02-2040_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	06-28-2020		07-02-2020		07-02-2020		07-01-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		0 - 0.3		0.3 - 2		2 - 4	
							N		N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	1020000	1020000	--	--	µg/kg	< 210		< 240		< 250		< 94		< 210		< 89	
2,4,5-Trichlorophenol	SW8270D	6320000	82100000	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
2,4,6-Trichlorophenol	SW8270D	49300	209000	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
2,4-Dichlorophenol	SW8270D	190000	2460000	--	--	µg/kg	< 210		< 240		< 250		< 94		< 210		< 89	
2,4-Dimethyl Phenol	SW8270D	1260000	16400000	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
2,4-Dinitrophenol	SW8270D	126000	1640000	--	--	µg/kg	< 11000		< 12000		< 13000		< 4600		< 11000		< 4400	
2,4-Dinitrotoluene	SW8270D	1740	7370	0.135443038	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
2,6-Dinitrotoluene	SW8270D	363	1540	0.137525773	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
2-Chloronaphthalene	SW8270D	4780000	60300000	--	--	µg/kg	< 210		< 240		< 250		< 94		< 210		< 89	
2-Chlorophenol	SW8270D	391000	5840000	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
2-Methylnaphthalene	SW8270D	239000	3010000	--	--	µg/kg	110	J	650		850		78	J	420		350	
2-Methylphenol	SW8270D	3160000	41000000	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
2-Nitroaniline	SW8270D	627000	8010000	--	--	µg/kg	< 5400		< 6000		< 6500		< 2400		< 5400		< 2300	
2-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
3,3'-Dichlorobenzidine	SW8270D	1210	5110	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	UJ	< 1100		< 440	
3-Nitroaniline	SW8270D	--	--	--	--	µg/kg	< 5400		< 6000		< 6500		< 2400		< 5400		< 2300	
4,6-Dinitro-2-Methylphenol	SW8270D	5060	65700	--	--	µg/kg	< 5400		< 6000		< 6500		< 2400		< 5400		< 2300	
4-Bromodiphenyl ether	SW8270D	26900	26900	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
4-Chloro-3-methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
4-Methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 1100	UJ	130	J	180	J	< 460		77	J	84	J
4-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 5400		< 6000		< 6500		< 2400		< 5400		< 2300	
Acenaphthene	SW8270D	3590000	45200000	--	--	µg/kg	300		1200		990		150		570		320	
Acenaphthylene	SW8270D	--	--	--	--	µg/kg	86	J	350		250	J	44	J	200	J	69	J
ACETOPHENONE	SW8270D	2520000	2520000	--	--	µg/kg	< 2100		< 2400		< 2500		< 940		< 2100		< 890	
Anthracene	SW8270D	17900000	100000000	196949.1525	--	µg/kg	360		2600		1900		180		1000		520	
ATRAZINE	SW8270D	2360	9990	3.9	--	µg/kg	< 2100		< 2400		< 2500		< 940		< 2100		< 890	
BENZALDEHYDE	SW8270D	174000	818000	--	--	µg/kg	< 2100		< 2400		< 2500		57	J	< 2100		< 890	
Benzo (a) anthracene	SW8270D	1140	20800	--	--	µg/kg	650		**3800**		**2600**		360		**1300**		830	J
Benzo (a) pyrene	SW8270D	115	2110	470	--	µg/kg	**490**		**3200**		**2300**		**310**		**1000**		**600**	**J**
Benzo (b) fluoranthene	SW8270D	1150	21100	478.0876494	--	µg/kg	**790**		**3600**		**2600**		**490**		**1400**		**810**	**J**
Benzo (ghi) perylene	SW8270D	--	--	--	--	µg/kg	360		2100		1600		200		790		480	J
Benzo (k) fluoranthene	SW8270D	11500	211000	--	--	µg/kg	270		1300		810		130		490		260	
Benzo(e)pyrene	SW8270D	--	--	--	--	µg/kg	390	J	1900		1500		240	J	800	J	460	
Biphenyl	SW8270D	68500	288000	--	--	µg/kg	39	J	210	J	170	J	25	J	100	J	60	J
bis(2-Chloroethoxy) Methane	SW8270D	190000	2460000	--	--	µg/kg	< 1100		< 1200	UJ	< 1300	UJ	< 460		< 1100	UJ	< 440	
Bis-(2-Chloroethyl) Ether	SW8270D	286	1290	--	--	µg/kg	< 210		< 240		< 250		< 94		< 210		< 89	
bis(2-Ethylhexyl)phthalate	SW8270D	38800	164000	2880	--	µg/kg	120	J	< 12000		< 13000		< 4600		< 11000		< 4400	
Butyl Benzyl Phthalate	SW8270D	286000	1210000	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
Caprolactam	SW8270D	31300000	100000000	--	--	µg/kg	< 5400	UJ	< 6000		< 6500		< 2400	UJ	< 5400		< 2300	UJ
Carbazole	SW8270D	--	--	--	--	µg/kg	93	J	860		440		52	J	180	J	110	
Chrysene	SW8270D	115000	2110000	144.2231076	--	µg/kg	**920**		**4100**		**2800**		**480**		**1800**		**970**	**J**
Dibenz (a,h) anthracene	SW8270D	115	2110	--	--	µg/kg	97	J	**470**		**400**		45	J	**220**		**120**	
Dibenzofuran	SW8270D	73000	1040000	--	--	µg/kg	250	J	860	J	690	J	140	J	390	J	230	J
Diethyl Phthalate	SW8270D	50600000	100000000	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
Dimethyl Phthalate	SW8270D	--	--	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
Di-n-Butylphthalate	SW8270D	6320000	82100000	5033.259424	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
Di-n-Octyl phthalate	SW8270D	632000	8210000	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	UJ

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM01		ND20-GM01		ND20-GM01		ND20-GM02		ND20-GM02		ND20-GM02	
						Sample ID	ND20-GM01-SURF_06/28/2020		ND20-GM01-0320_07/02/2020		ND20-GM01-2040_07/02/2020		ND20-GM02-SURF_07/01/2020		ND20-GM02-0320_07/02/2020		ND20-GM02-2040_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	06-28-2020		07-02-2020		07-02-2020		07-01-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	0 - 0.3		0.3 - 2		2 - 4		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene	SW8270D	2390000	30100000	88877.80549	--	µg/kg	2400		9500		6800		1100	J	4500		2000	J
Fluorene	SW8270D	2390000	30100000	14829.93197	--	µg/kg	420		1400		1200		200	J	930		420	
Hexachlorobenzene	SW8270D	252	1150	25.2	--	µg/kg	< 210		< 240		< 250		< 94		< 210		< 89	
Hexachlorobutadiene	SW8270D	1630	7190	--	--	µg/kg	< 210		< 240		< 250		< 94		< 210		< 89	
Hexachlorocyclopentadiene	SW8270D	2550	10800	--	--	µg/kg	< 1100		< 1200		< 1300		< 460	UJ	< 1100		< 440	
Hexachloroethane	SW8270D	2520	11100	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
Indeno (1,2,3-cd) pyrene	SW8270D	1150	21100	--	--	µg/kg	290		**1700**		**1200**		170		630		370	
Isophorone	SW8270D	571000	2420000	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
Naphthalene	SW8270D	5520	24100	658.1818182	--	µg/kg	150	J	**1100**		**1300**		100		450		440	
Nitrobenzene	SW8270D	7420	32400	--	--	µg/kg	< 2100		< 2400		< 2500		< 940		< 2100		< 880	
N-Nitroso-Di-N-Propylamine	SW8270D	77.5	328	--	--	µg/kg	< 210	UJ	< 240		< 250		< 94		< 210		< 89	UJ
N-Nitrosodiphenylamine	SW8270D	111000	469000	76.42622951	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
P-Chloroaniline	SW8270D	2710	11500	--	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
Pentachlorophenol	SW8270D	1020	3970	2.76	--	µg/kg	< 5400	UJ	< 6000	UJ	< 6500	UJ	< 2400		< 5400	UJ	< 2300	UJ
Phenanthrene	SW8270D	--	--	--	--	µg/kg	680		8200		6900		500		3500		1900	
Phenol	SW8270D	19000000	100000000	2294.627383	--	µg/kg	< 1100		< 1200		< 1300		< 460		< 1100		< 440	
P-Nitroaniline	SW8270D	27100	115000	--	--	µg/kg	< 5400		< 6000		< 6500		< 2400		< 5400		< 2300	
Pyrene	SW8270D	1790000	22600000	54545.45455	--	µg/kg	1900		7000		5300		900	J	3000		2000	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	0.484	2.19	--	--	µg/kg	-		-		-		**4.9**	J	-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		**0.88**	J	-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		0.04		-		-	
1,2,3,4,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		0.022		-		-	
1,2,3,4,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		**0.056**		-		-	
1,2,3,6,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		**0.11**	J	-		-	
1,2,3,6,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		0.022		-		-	
1,2,3,7,8,9-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		**0.054**		-		-	
1,2,3,7,8,9-HxCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		< 0.021		-		-	
1,2,3,7,8-PeCDD	E1613B	0.00493	0.0223	--	--	µg/kg	-		-		-		< 0.021		-		-	
1,2,3,7,8-PeCDF	E1613B	0.164	0.744	--	--	µg/kg	-		-		-		0.0097	J	-		-	
2,3,4,6,7,8-HXCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		0.0092	J	-		-	
2,3,4,7,8-PECDF	E1613B	0.0164	0.0744	--	--	µg/kg	-		-		-		0.0097	J	-		-	
2,3,7,8-TCDD	E1613B	0.00482	0.0218	0.03	--	µg/kg	-		-		-		0.0017	J	-		-	
2,3,7,8-TCDF	E1613B	0.0484	0.219	--	--	µg/kg	-		-		-		0.0031	J	-		-	
OCDD	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		**110**	J	-		-	
OCDF	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		2.4	J	-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	µg/kg	< 4.3	UJ	< 3.1	UJ	< 2.5	UJ	< 3.6		< 2.8		< 2.3	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	-		< 49		< 40		-		< 45		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	< 5.6		< 4		< 3.3		< 4.7		< 3.7		< 3	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	< 5		< 3.6		< 2.9		< 4.2		< 3.3		< 2.6	
Other																		
Moisture	SM2540	--	--	--	--	%	220		140		90		180		110		77	
Total Organic Carbon	SW9060	--	--	--	--	mg/kg	96700		78100		39400		77700		90300		33800	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM02		ND20-GM02		ND20-GM02		ND20-GM03		ND20-GM03		ND20-GM03	
						Sample ID	ND20-GM02-4060_07/02/2020		ND20-GM02-6080_07/02/2020		ND20-GM02-8010_07/02/2020		ND20-GM03-SURF_06/28/2020		ND20-GM03-0320_07/02/2020		ND20-GM03-2040_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	4 - 6		6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Metals																		
Aluminum	SW6010	77500000	100000000	600000	28721000	µg/kg	**11200000**		**9670000**		**4770000**		**15500000**		**8800000**		**12800000**	
Antimony	SW6010	31300	467000	542	--	µg/kg	< 9000		**820**	**J**	< 6900		< 12200		< 8200		**700**	**J**
Arsenic	SW6010	677	3000	584	8300	µg/kg	**5100**		**6500**		**3600**		**5800**		**4900**		**5200**	
Barium	SW6010	15300000	100000000	164800	364000	µg/kg	92200		102000		46300		163000	*	100000		107000	
Beryllium	SW6010	156000	2300000	6320	--	µg/kg	550	J	550	J	250	J	570	J	430	J	580	J
Cadmium	SW6010	71100	985000	752	1070	µg/kg	**890**		**1100**		290	J	520	J	580	J	**950**	
Calcium Metal	SW6010	--	--	--	14536000	µg/kg	13700000		14300000		**16500000**		10600000	*	10000000		**14900000**	
Chromium	SW6010	--	--	360000000	43500	µg/kg	26200		23700		11300		34000	J	21200		31000	
Cobalt	SW6010	23400	347000	3607.321132	22000	µg/kg	**8200**		**7600**	**J**	**4000**	**J**	**11300**		**7100**		**9400**	
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	**51500**		**68800**		26200		**70000**		**45800**	*****	**76500**	*****
Iron	SW6010	54800000	100000000	--	34314000	µg/kg	22000000		20500000		9970000		30800000		18200000		24600000	
Lead	SW6010	400000	800000	27000	51600	µg/kg	**64200**		**345000**		23200		24600		**57800**	**J**	**66800**	**J**
Magnesium	SW6010	--	--	--	8290000	µg/kg	**9110000**		**8750000**		6470000		**9590000**	*****	6760000		**10600000**	
Manganese	SW6010	1830000	25900000	39124.42396	2937000	µg/kg	**302000**	*****	**244000**	*****	**164000**	*****	**822000**		**285000**		**360000**	
Mercury	SW6010	3130	3130	208	--	µg/kg	**540**		**460**		52	J	< 270		< 150		< 190	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	**21700**		**19900**		10600		**27800**	**J**	**18300**		**25000**	
Potassium	SW6010	--	--	--	--	µg/kg	1460000		1270000		627000		1980000		1090000		1610000	
Selenium	SW6010	391000	5840000	520	--	µg/kg	**850**	**J**	**1200**	**J**	< 4000		**1400**	**J**	< 4800		**980**	**J**
Silver	SW6010	391000	5840000	849.0967056	--	µg/kg	140	J	220	J	< 1100		220	J	140	J	330	J
Sodium	SW6010	--	--	--	--	µg/kg	300000	J	297000	J	229000	J	322000	J	248000	J	302000	J
Thallium	SW6010	782	11700	284	--	µg/kg	< 3700		< 4100		< 2900		< 5100		< 3400		< 3600	
Vanadium	SW6010	393000	5840000	60000	85000	µg/kg	37700		32400		22800		42800		31600		39600	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	**222000**		**265000**		59300		117000	*	131000		**216000**	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	4110	28000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1221	SW8081	213	883	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1232	SW8081	190	792	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1242	SW8081	235	972	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1248	SW8081	236	975	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1254	SW8081	239	988	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1260	SW8081	243	1000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	-		-		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM02		ND20-GM02		ND20-GM02		ND20-GM03		ND20-GM03		ND20-GM03	
						Sample ID	ND20-GM02-4060_07/02/2020		ND20-GM02-6080_07/02/2020		ND20-GM02-8010_07/02/2020		ND20-GM03-SURF_06/28/2020		ND20-GM03-0320_07/02/2020		ND20-GM03-2040_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	4 - 6		6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	640000	640000	140.2	--	µg/kg	-		-		-		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	810	3600	0.156406869	--	µg/kg	-		-		-		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	910000	910000	--	--	µg/kg	-		-		-		-		-		-	
1,1,2-Trichloroethane	SW8260	1590	7010	3.24	--	µg/kg	-		-		-		-		-		-	
1,1-Dichloroethane	SW8260	5060	22200	483.4181818	--	µg/kg	-		-		-		-		-		-	
1,1-Dichloroethene	SW8260	320000	1190000	5.02	--	µg/kg	-		-		-		-		-		-	
1,2,4-Trichlorobenzene	SW8260	24000	113000	408	--	µg/kg	-		-		-		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	7.5	92.3	0.1728	--	µg/kg	-		-		-		-		-		-	
1,2-Dibromoethane	SW8260	50	221	0.0282	--	µg/kg	-		-		-		-		-		-	
1,2-Dichlorobenzene	SW8260	376000	376000	1168	--	µg/kg	-		-		-		-		-		-	
1,2-Dichloroethane	SW8260	652	2870	2.84	--	µg/kg	-		-		-		-		-		-	
1,2-Dichloropropane	SW8260	3400	15000	3.32	--	µg/kg	-		-		-		-		-		-	
1,4-Dichlorobenzene	SW8260	3740	16400	144	--	µg/kg	-		-		-		-		-		-	
2-Butanone	SW8260	28400000	28400000	1666.068223	--	µg/kg	-		-		-		-		-		-	
2-Hexanone	SW8260	237000	1760000	--	--	µg/kg	-		-		-		-		-		-	
4-Methyl-2-pentanone	SW8260	3360000	3360000	225.2396166	--	µg/kg	-		-		-		-		-		-	
Acetone	SW8260	63400000	100000000	3676.595745	--	µg/kg	-		-		-		-		-		-	
Benzene	SW8260	1600	7070	5.12	--	µg/kg	-		-		-		-		-		-	
Bromodichloromethane	SW8260	418	1830	0.3255	--	µg/kg	-		-		-		-		-		-	
Bromoform	SW8260	25400	113000	2.332	--	µg/kg	-		-		-		-		-		-	
Bromomethane	SW8260	9600	43000	5.059602649	--	µg/kg	-		-		-		-		-		-	
Carbon Disulfide	SW8260	738000	738000	591.8618989	--	µg/kg	-		-		-		-		-		-	
Carbon Tetrachloride	SW8260	916	4030	3.88	--	µg/kg	-		-		-		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	126000	530000	3086.294416	--	µg/kg	-		-		-		-		-		-	
Chlorobenzene	SW8260	370000	761000	135.8	--	µg/kg	-		-		-		-		-		-	
Chloroethane	SW8260	2120000	2120000	226.6028708	--	µg/kg	-		-		-		-		-		-	
Chloroform	SW8260	454	1980	3.33	--	µg/kg	-		-		-		-		-		-	
Chloromethane	SW8260	159000	669000	15.5106383	--	µg/kg	-		-		-		-		-		-	
cis-1,2-Dichloroethene	SW8260	156000	2340000	41.2	--	µg/kg	-		-		-		-		-		-	
cis-1,3-Dichloropropene	SW8260	1210000	1210000	--	--	µg/kg	-		-		-		-		-		-	
Cyclohexane	SW8260	117000	117000	--	--	µg/kg	-		-		-		-		-		-	
Dibromochloromethane	SW8260	8280	38900	31.95	--	µg/kg	-		-		-		-		-		-	
Ethylbenzene	SW8260	8020	35400	1570	--	µg/kg	-		-		-		-		-		-	
Isopropylbenzene	SW8260	268000	268000	--	--	µg/kg	-		-		-		-		-		-	
M-Dichlorobenzene	SW8260	297000	297000	1152.77434	--	µg/kg	-		-		-		-		-		-	
Methyl Acetate	SW8260	29000000	29000000	--	--	µg/kg	-		-		-		-		-		-	
Methyl tert-Butyl Ether	SW8260	63800	282000	27.02097902	--	µg/kg	-		-		-		-		-		-	
Methylcyclohexane	SW8260	67600	67600	--	--	µg/kg	-		-		-		-		-		-	
Methylene Chloride	SW8260	61800	1150000	2.56	--	µg/kg	-		-		-		-		-		-	
Styrene	SW8260	867000	867000	220	--	µg/kg	-		-		-		-		-		-	
Tetrachloroethene	SW8260	33000	145000	4.54	--	µg/kg	-		-		-		-		-		-	
Toluene	SW8260	818000	818000	1107.2	--	µg/kg	-		-		-		-		-		-	
trans-1,2-Dichloroethene	SW8260	1560000	1850000	62.6	--	µg/kg	-		-		-		-		-		-	
trans-1,3-Dichloropropene	SW8260	1510000	1510000	--	--	µg/kg	-		-		-		-		-		-	
Trichloroethene	SW8260	1300	8410	3.58	--	µg/kg	-		-		-		-		-		-	
Trichlorofluoromethane	SW8260	1230000	1230000	4477.48062	--	µg/kg	-		-		-		-		-		-	
Vinyl Chloride	SW8260	66.8	2080	0.138	--	µg/kg	-		-		-		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	µg/kg	-		-		-		-		-		-	
o-Xylene	SW8260	434000	434000	--	--	µg/kg	-		-		-		-		-		-	
Xylenes (total)	SW8260	260000	260000	3960	--	µg/kg	-		-		-		-		-		-	

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Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM02		ND20-GM02		ND20-GM02		ND20-GM03		ND20-GM03		ND20-GM03	
						Sample ID	ND20-GM02-4060_07/02/2020		ND20-GM02-6080_07/02/2020		ND20-GM02-8010_07/02/2020		ND20-GM03-SURF_06/28/2020		ND20-GM03-0320_07/02/2020		ND20-GM03-2040_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	4 - 6		6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	1020000	1020000	--	--	µg/kg	< 240		< 160		< 24		< 92		< 150		< 250	
2,4,5-Trichlorophenol	SW8270D	6320000	82100000	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
2,4,6-Trichlorophenol	SW8270D	49300	209000	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
2,4-Dichlorophenol	SW8270D	190000	2460000	--	--	µg/kg	< 240		< 160		< 24		< 92		< 150		< 250	
2,4-Dimethyl Phenol	SW8270D	1260000	16400000	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
2,4-Dinitrophenol	SW8270D	126000	1640000	--	--	µg/kg	< 12000		< 7800		< 1200		< 4500		< 7500		< 12000	
2,4-Dinitrotoluene	SW8270D	1740	7370	0.135443038	--	µg/kg	**< 1200**		**< 780**		**< 120**		**< 450**		**< 750**		**< 1200**	
2,6-Dinitrotoluene	SW8270D	363	1540	0.137525773	--	µg/kg	**< 1200**		**< 780**		**< 120**		**< 450**		**< 750**		**< 1200**	
2-Chloronaphthalene	SW8270D	4780000	60300000	--	--	µg/kg	< 240		< 160		< 24		< 92		< 150		< 250	
2-Chlorophenol	SW8270D	391000	5840000	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
2-Methylnaphthalene	SW8270D	239000	3010000	--	--	µg/kg	840		900		120		77	J	270		540	
2-Methylphenol	SW8270D	3160000	41000000	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
2-Nitroaniline	SW8270D	627000	8010000	--	--	µg/kg	< 6200		< 4000		< 600		< 2300		< 3900		< 6300	
2-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
3,3'-Dichlorobenzidine	SW8270D	1210	5110	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
3-Nitroaniline	SW8270D	--	--	--	--	µg/kg	< 6200		< 4000		< 600		< 2300		< 3900		< 6300	
4,6-Dinitro-2-Methylphenol	SW8270D	5060	65700	--	--	µg/kg	**< 6200**		< 4000		< 600		< 2300		< 3900		**< 6300**	
4-Bromodiphenyl ether	SW8270D	26900	26900	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
4-Chloro-3-methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
4-Methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	240	J	260	J	71	J	22	J	730	J	99	J
4-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 6200		< 4000		< 600		< 2300		< 3900		< 6300	
Acenaphthene	SW8270D	3590000	45200000	--	--	µg/kg	1200		920		210		93		560		750	
Acenaphthylene	SW8270D	--	--	--	--	µg/kg	240	J	200		55		62	J	140	J	150	J
ACETOPHENONE	SW8270D	2520000	2520000	--	--	µg/kg	< 2400		< 1600		< 240		< 920		< 1500		< 2500	
Anthracene	SW8270D	17900000	100000000	196949.1525	--	µg/kg	1700		1300		370		210		1400		1500	
ATRAZINE	SW8270D	2360	9990	3.9	--	µg/kg	**< 2400**		**< 1600**		**< 240**		**< 920**		**< 1500**		**< 2500**	
BENZALDEHYDE	SW8270D	174000	818000	--	--	µg/kg	< 2400		< 1600		7.5	J	31	J	< 1500		< 2500	
Benzo (a) anthracene	SW8270D	1140	20800	--	--	µg/kg	**2300**		**2000**		630		540		**2600**		**2500**	
Benzo (a) pyrene	SW8270D	115	2110	470	--	µg/kg	**1900**		**1700**		**560**		**470**		**2100**		**2100**	
Benzo (b) fluoranthene	SW8270D	1150	21100	478.0876494	--	µg/kg	**2200**		**1900**		**680**		**550**		**2600**		**3400**	
Benzo (ghi) perylene	SW8270D	--	--	--	--	µg/kg	1300		1200		400		320		1300		1300	
Benzo (k) fluoranthene	SW8270D	11500	211000	--	--	µg/kg	770		690		160		190		850		920	
Benzo(e)pyrene	SW8270D	--	--	--	--	µg/kg	1300		1100		350		300	J	1300		1300	
Biphenyl	SW8270D	68500	288000	--	--	µg/kg	180	J	160	J	30	J	24	J	74	J	130	J
bis(2-Chloroethoxy) Methane	SW8270D	190000	2460000	--	--	µg/kg	< 1200	UJ	< 780	UJ	< 120	UJ	< 450		< 750	UJ	< 1200	
Bis-(2-Chloroethyl) Ether	SW8270D	286	1290	--	--	µg/kg	< 240		< 160		< 24		< 92		< 150		< 250	
bis(2-Ethylhexyl)phthalate	SW8270D	38800	164000	2880	--	µg/kg	**< 12000**		**< 7800**		< 1200		**< 4500**		130	J	**< 12000**	
Butyl Benzyl Phthalate	SW8270D	286000	1210000	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
Caprolactam	SW8270D	31300000	100000000	--	--	µg/kg	< 6200		< 4000		< 600		< 2300		< 3900		< 6300	
Carbazole	SW8270D	--	--	--	--	µg/kg	360		260		98		57	J	460		490	
Chrysene	SW8270D	115000	2110000	144.2231076	--	µg/kg	**2500**		**2100**		**640**		**540**		**2700**		**2500**	
Dibenz (a,h) anthracene	SW8270D	115	2110	--	--	µg/kg	**320**		**330**		94		**160**		**410**		**510**	
Dibenzofuran	SW8270D	73000	1040000	--	--	µg/kg	660	J	570	J	100	J	92	J	400	J	500	J
Diethyl Phthalate	SW8270D	50600000	100000000	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
Dimethyl Phthalate	SW8270D	--	--	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
Di-n-Butylphthalate	SW8270D	6320000	82100000	5033.259424	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
Di-n-Octyl phthalate	SW8270D	632000	8210000	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM02		ND20-GM02		ND20-GM02		ND20-GM03		ND20-GM03		ND20-GM03	
						Sample ID	ND20-GM02-4060_07/02/2020		ND20-GM02-6080_07/02/2020		ND20-GM02-8010_07/02/2020		ND20-GM03-SURF_06/28/2020		ND20-GM03-0320_07/02/2020		ND20-GM03-2040_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	4 - 6		6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	N		N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene	SW8270D	2390000	30100000	88877.80549	--	µg/kg	6500		5000		1500		1200		6100		6100	
Fluorene	SW8270D	2390000	30100000	14829.93197	--	µg/kg	1500		1000		160		140		700		920	
Hexachlorobenzene	SW8270D	252	1150	25.2	--	µg/kg	< 240		< 160		< 24		< 92		< 150		< 250	
Hexachlorobutadiene	SW8270D	1630	7190	--	--	µg/kg	< 240		< 160		< 24		< 92		< 150		< 250	
Hexachlorocyclopentadiene	SW8270D	2550	10800	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
Hexachloroethane	SW8270D	2520	11100	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
Indeno (1,2,3-cd) pyrene	SW8270D	1150	21100	--	--	µg/kg	1100		960		330		290		**1200**		1100	
Isophorone	SW8270D	571000	2420000	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
Naphthalene	SW8270D	5520	24100	658.1818182	--	µg/kg	**1300**		**1500**		270		120		640		**950**	
Nitrobenzene	SW8270D	7420	32400	--	--	µg/kg	< 2400		< 1600		< 240		< 910		< 1500		< 2500	
N-Nitroso-Di-N-Propylamine	SW8270D	77.5	328	--	--	µg/kg	< 240		< 160		< 24		< 92		< 150		< 250	
N-Nitrosodiphenylamine	SW8270D	111000	469000	76.42622951	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
P-Chloroaniline	SW8270D	2710	11500	--	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
Pentachlorophenol	SW8270D	1020	3970	2.76	--	µg/kg	< 6200	UJ	< 4000	UJ	< 600	UJ	< 2300		< 3900	UJ	< 6300	
Phenanthrene	SW8270D	--	--	--	--	µg/kg	7300		5400		1100		600		4600		6100	
Phenol	SW8270D	19000000	100000000	2294.627383	--	µg/kg	< 1200		< 780		< 120		< 450		< 750		< 1200	
P-Nitroaniline	SW8270D	27100	115000	--	--	µg/kg	< 6200		< 4000		< 600		< 2300		< 3900		< 6300	
Pyrene	SW8270D	1790000	22600000	54545.45455	--	µg/kg	4800		3900		1200		1000		4400		5600	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	0.484	2.19	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	0.00493	0.0223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	0.164	0.744	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	0.0164	0.0744	--	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDD	E1613B	0.00482	0.0218	0.03	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDF	E1613B	0.0484	0.219	--	--	µg/kg	-		-		-		-		-		-	
OCDD	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
OCDF	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	µg/kg	< 2.4		< 2.4		< 1.9		-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	< 37		< 39		< 29		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	< 3.1		< 3.2		< 2.4		-		-		-	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	< 2.7		< 2.8		< 2.1		-		-		-	
Other																		
Moisture	SM2540	--	--	--	--	%	82		89		42		170		72		85	
Total Organic Carbon	SW9060	--	--	--	--	mg/kg	49200		53000		9370		71700		48500		42800	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM03		ND20-GM03		ND20-GM03		ND20-GM04		ND20-GM04		ND20-GM04	
						Sample ID	ND20-GM03-4060_07/02/2020		ND20-GM03-6080_07/02/2020		ND20-GM03-8010_07/02/2020		ND20-GM04-0320_06/29/2020		ND20-GM04-2040_06/29/2020		ND20-GM04-4060_06/29/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		07-02-2020		06-29-2020		06-29-2020		06-29-2020	
						Sample Depth (ft bss)	4 - 6		6 - 8		8 - 10		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Metals																		
Aluminum	SW6010	77500000	100000000	600000	28721000	µg/kg	**8300000**		**10000000**		**7360000**		**10700000**		**11600000**		**7600000**	
Antimony	SW6010	31300	467000	542	--	µg/kg	**730**	**J**	**760**	**J**	520	J	< 7500		< 9600		< 8500	
Arsenic	SW6010	677	3000	584	8300	µg/kg	**4600**		**5900**		**5000**		**5000**		**4800**		**5600**	
Barium	SW6010	15300000	100000000	164800	364000	µg/kg	72500		95200		99400		107000		117000		86400	
Beryllium	SW6010	156000	2300000	6320	--	µg/kg	450	J	530	J	400	J	470	J	530	J	480	J
Cadmium	SW6010	71100	985000	752	1070	µg/kg	**1300**		**1100**		**860**		540	J	670	J	**910**	
Calcium Metal	SW6010	--	--	--	14536000	µg/kg	**16900000**		13500000		**16000000**		12200000		14500000		13300000	
Chromium	SW6010	--	--	360000000	43500	µg/kg	21300		24500		17500		24600		26200		19600	
Cobalt	SW6010	23400	347000	3607.321132	22000	µg/kg	**7100**		**7600**		**6700**		**8100**		**8300**		**6600**	**J**
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	**48600**	*****	**78500**	*****	**106000**	*****	**43600**		**45400**		**58400**	
Iron	SW6010	54800000	100000000	--	34314000	µg/kg	18900000		21600000		16400000		20700000		22600000		16600000	
Lead	SW6010	400000	800000	27000	51600	µg/kg	**69600**	**J**	**131000**	**J**	**155000**	**J**	**45000**		**68400**		**103000**	
Magnesium	SW6010	--	--	--	8290000	µg/kg	**9280000**		**8940000**		7970000		8260000		8030000		7290000	
Manganese	SW6010	1830000	25900000	39124.42396	2937000	µg/kg	**279000**		**267000**		**216000**		**355000**	*****	**408000**	*****	**205000**	*****
Mercury	SW6010	3130	3130	208	--	µg/kg	**340**		**260**		< 150		49	J	**270**		200	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	**18400**		**19700**		**17600**		**20600**		**21300**		**17000**	
Potassium	SW6010	--	--	--	--	µg/kg	1060000		1270000		936000		1310000		1400000		988000	
Selenium	SW6010	391000	5840000	520	--	µg/kg	< 3700		**1000**	**J**	**850**	**J**	**1200**	**J**	< 5600		**1200**	**J**
Silver	SW6010	391000	5840000	849.0967056	--	µg/kg	150	J	150	J	110	J	< 1300		< 1600		< 1400	
Sodium	SW6010	--	--	--	--	µg/kg	256000	J	269000	J	246000	J	301000	J	299000	J	254000	J
Thallium	SW6010	782	11700	284	--	µg/kg	< 2600		< 3400		< 2700		< 3100		< 4000		< 3500	
Vanadium	SW6010	393000	5840000	60000	85000	µg/kg	32500		33000		33200		35400		35600		28500	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	**191000**		**271000**		**183000**		136000		**157000**		**254000**	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	4110	28000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1221	SW8081	213	883	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1232	SW8081	190	792	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1242	SW8081	235	972	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1248	SW8081	236	975	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1254	SW8081	239	988	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1260	SW8081	243	1000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	-		-		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM03	ND20-GM03	ND20-GM03	ND20-GM04	ND20-GM04	ND20-GM04
						Sample ID	ND20-GM03-4060_07/02/2020	ND20-GM03-6080_07/02/2020	ND20-GM03-8010_07/02/2020	ND20-GM04-0320_06/29/2020	ND20-GM04-2040_06/29/2020	ND20-GM04-4060_06/29/2020
						Parent Sample ID	--	--	--	--	--	--
						Date	07-02-2020	07-02-2020	07-02-2020	06-29-2020	06-29-2020	06-29-2020
						Sample Depth (ft bss)	4 - 6	6 - 8	8 - 10	0.3 - 2	2 - 4	4 - 6
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N	N	N	N	N	N
Volatile Organic Compounds												
1,1,1-Trichloroethane	SW8260	640000	640000	140.2	--	µg/kg	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	SW8260	810	3600	0.156406869	--	µg/kg	-	-	-	-	-	-
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	910000	910000	--	--	µg/kg	-	-	-	-	-	-
1,1,2-Trichloroethane	SW8260	1590	7010	3.24	--	µg/kg	-	-	-	-	-	-
1,1-Dichloroethane	SW8260	5060	22200	483.4181818	--	µg/kg	-	-	-	-	-	-
1,1-Dichloroethene	SW8260	320000	1190000	5.02	--	µg/kg	-	-	-	-	-	-
1,2,4-Trichlorobenzene	SW8260	24000	113000	408	--	µg/kg	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	7.5	92.3	0.1728	--	µg/kg	-	-	-	-	-	-
1,2-Dibromoethane	SW8260	50	221	0.0282	--	µg/kg	-	-	-	-	-	-
1,2-Dichlorobenzene	SW8260	376000	376000	1168	--	µg/kg	-	-	-	-	-	-
1,2-Dichloroethane	SW8260	652	2870	2.84	--	µg/kg	-	-	-	-	-	-
1,2-Dichloropropane	SW8260	3400	15000	3.32	--	µg/kg	-	-	-	-	-	-
1,4-Dichlorobenzene	SW8260	3740	16400	144	--	µg/kg	-	-	-	-	-	-
2-Butanone	SW8260	28400000	28400000	1666.068223	--	µg/kg	-	-	-	-	-	-
2-Hexanone	SW8260	237000	1760000	--	--	µg/kg	-	-	-	-	-	-
4-Methyl-2-pentanone	SW8260	3360000	3360000	225.2396166	--	µg/kg	-	-	-	-	-	-
Acetone	SW8260	63400000	100000000	3676.595745	--	µg/kg	-	-	-	-	-	-
Benzene	SW8260	1600	7070	5.12	--	µg/kg	-	-	-	-	-	-
Bromodichloromethane	SW8260	418	1830	0.3255	--	µg/kg	-	-	-	-	-	-
Bromoform	SW8260	25400	113000	2.332	--	µg/kg	-	-	-	-	-	-
Bromomethane	SW8260	9600	43000	5.059602649	--	µg/kg	-	-	-	-	-	-
Carbon Disulfide	SW8260	738000	738000	591.8618989	--	µg/kg	-	-	-	-	-	-
Carbon Tetrachloride	SW8260	916	4030	3.88	--	µg/kg	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	SW8260	126000	530000	3086.294416	--	µg/kg	-	-	-	-	-	-
Chlorobenzene	SW8260	370000	761000	135.8	--	µg/kg	-	-	-	-	-	-
Chloroethane	SW8260	2120000	2120000	226.6028708	--	µg/kg	-	-	-	-	-	-
Chloroform	SW8260	454	1980	3.33	--	µg/kg	-	-	-	-	-	-
Chloromethane	SW8260	159000	669000	15.5106383	--	µg/kg	-	-	-	-	-	-
cis-1,2-Dichloroethene	SW8260	156000	2340000	41.2	--	µg/kg	-	-	-	-	-	-
cis-1,3-Dichloropropene	SW8260	1210000	1210000	--	--	µg/kg	-	-	-	-	-	-
Cyclohexane	SW8260	117000	117000	--	--	µg/kg	-	-	-	-	-	-
Dibromochloromethane	SW8260	8280	38900	31.95	--	µg/kg	-	-	-	-	-	-
Ethylbenzene	SW8260	8020	35400	1570	--	µg/kg	-	-	-	-	-	-
Isopropylbenzene	SW8260	268000	268000	--	--	µg/kg	-	-	-	-	-	-
M-Dichlorobenzene	SW8260	297000	297000	1152.77434	--	µg/kg	-	-	-	-	-	-
Methyl Acetate	SW8260	29000000	29000000	--	--	µg/kg	-	-	-	-	-	-
Methyl tert-Butyl Ether	SW8260	63800	282000	27.02097902	--	µg/kg	-	-	-	-	-	-
Methylcyclohexane	SW8260	67600	67600	--	--	µg/kg	-	-	-	-	-	-
Methylene Chloride	SW8260	61800	1150000	2.56	--	µg/kg	-	-	-	-	-	-
Styrene	SW8260	867000	867000	220	--	µg/kg	-	-	-	-	-	-
Tetrachloroethene	SW8260	33000	145000	4.54	--	µg/kg	-	-	-	-	-	-
Toluene	SW8260	818000	818000	1107.2	--	µg/kg	-	-	-	-	-	-
trans-1,2-Dichloroethene	SW8260	1560000	1850000	62.6	--	µg/kg	-	-	-	-	-	-
trans-1,3-Dichloropropene	SW8260	1510000	1510000	--	--	µg/kg	-	-	-	-	-	-
Trichloroethene	SW8260	1300	8410	3.58	--	µg/kg	-	-	-	-	-	-
Trichlorofluoromethane	SW8260	1230000	1230000	4477.48062	--	µg/kg	-	-	-	-	-	-
Vinyl Chloride	SW8260	66.8	2080	0.138	--	µg/kg	-	-	-	-	-	-
m,p-Xylene	SW8260	--	--	--	--	µg/kg	-	-	-	-	-	-
o-Xylene	SW8260	434000	434000	--	--	µg/kg	-	-	-	-	-	-
Xylenes (total)	SW8260	260000	260000	3960	--	µg/kg	-	-	-	-	-	-

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM03		ND20-GM03		ND20-GM03		ND20-GM04		ND20-GM04		ND20-GM04	
						Sample ID	ND20-GM03-4060_07/02/2020		ND20-GM03-6080_07/02/2020		ND20-GM03-8010_07/02/2020		ND20-GM04-0320_06/29/2020		ND20-GM04-2040_06/29/2020		ND20-GM04-4060_06/29/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		07-02-2020		06-29-2020		06-29-2020		06-29-2020	
						Sample Depth (ft bss)	4 - 6		6 - 8		8 - 10		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	1020000	1020000	--	--	µg/kg	< 100		< 230		< 200		< 59		< 91		< 120	
2,4,5-Trichlorophenol	SW8270D	6320000	82100000	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
2,4,6-Trichlorophenol	SW8270D	49300	209000	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
2,4-Dichlorophenol	SW8270D	190000	2460000	--	--	µg/kg	< 100		< 230		< 200		< 59		< 91		< 120	
2,4-Dimethyl Phenol	SW8270D	1260000	16400000	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
2,4-Dinitrophenol	SW8270D	126000	1640000	--	--	µg/kg	< 5000		< 11000		< 9800		< 2900		< 4500		< 6100	
2,4-Dinitrotoluene	SW8270D	1740	7370	0.135443038	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
2,6-Dinitrotoluene	SW8270D	363	1540	0.137525773	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
2-Chloronaphthalene	SW8270D	4780000	60300000	--	--	µg/kg	< 100		< 230		< 200		< 59		< 91		< 120	
2-Chlorophenol	SW8270D	391000	5840000	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
2-Methylnaphthalene	SW8270D	239000	3010000	--	--	µg/kg	390		1500		410		170		210		750	
2-Methylphenol	SW8270D	3160000	41000000	--	--	µg/kg	< 500		41	J	< 980		< 290		< 450		< 610	
2-Nitroaniline	SW8270D	627000	8010000	--	--	µg/kg	< 2600		< 5800		< 5100		< 1500		< 2300		< 3200	
2-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
3,3'-Dichlorobenzidine	SW8270D	1210	5110	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
3-Nitroaniline	SW8270D	--	--	--	--	µg/kg	< 2600		< 5800		< 5100		< 1500		< 2300		< 3200	
4,6-Dinitro-2-Methylphenol	SW8270D	5060	65700	--	--	µg/kg	< 2600		< 5800		< 5100		< 1500		< 2300		< 3200	
4-Bromodiphenyl ether	SW8270D	26900	26900	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
4-Chloro-3-methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
4-Methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	120	J	180	J	87	J	69	J	81	J	150	J
4-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 2600		< 5800		< 5100		< 1500		< 2300		< 3200	
Acenaphthene	SW8270D	3590000	45200000	--	--	µg/kg	450		1400		550		290		590		910	
Acenaphthylene	SW8270D	--	--	--	--	µg/kg	260		230	J	170	J	85		120		690	
ACETOPHENONE	SW8270D	2520000	2520000	--	--	µg/kg	< 1000		< 2300		< 2000		17	J	< 910		< 1200	
Anthracene	SW8270D	17900000	100000000	196949.1525	--	µg/kg	930		1900		860		470		1200		1900	
ATRAZINE	SW8270D	2360	9990	3.9	--	µg/kg	< 1000		< 2300		< 2000		< 590		< 910		< 1200	
BENZALDEHYDE	SW8270D	174000	818000	--	--	µg/kg	< 1000		< 2300		< 2000		52	J	45	J	< 1200	
Benzo (a) anthracene	SW8270D	1140	20800	--	--	µg/kg	**1700**		**4100**		**1800**		1000		**2800**		**3300**	
Benzo (a) pyrene	SW8270D	115	2110	470	--	µg/kg	**1300**		**3300**		**1500**		**830**		**2200**		**2600**	
Benzo (b) fluoranthene	SW8270D	1150	21100	478.0876494	--	µg/kg	**1500**		**3400**		**1800**		**1000**		**2400**		**2900**	
Benzo (ghi) perylene	SW8270D	--	--	--	--	µg/kg	780		2100		920		560		1400		1500	
Benzo (k) fluoranthene	SW8270D	11500	211000	--	--	µg/kg	520		1300		500		340		910		990	
Benzo(e)pyrene	SW8270D	--	--	--	--	µg/kg	780		2100		890	J	520		1300		1500	
Biphenyl	SW8270D	68500	288000	--	--	µg/kg	71	J	230	J	82	J	43	J	57	J	130	J
bis(2-Chloroethoxy) Methane	SW8270D	190000	2460000	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
Bis-(2-Chloroethyl) Ether	SW8270D	286	1290	--	--	µg/kg	< 100		< 230		< 200		< 59		< 91		< 120	
bis(2-Ethylhexyl)phthalate	SW8270D	38800	164000	2880	--	µg/kg	< 5000		< 11000		< 9800		< 2900		< 4500		< 6100	
Butyl Benzyl Phthalate	SW8270D	286000	1210000	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
Caprolactam	SW8270D	31300000	100000000	--	--	µg/kg	< 2600		< 5800		< 5100		< 1500		< 2300		< 3200	
Carbazole	SW8270D	--	--	--	--	µg/kg	150		760		370		140		430		310	
Chrysene	SW8270D	115000	2110000	144.2231076	--	µg/kg	**1600**		**4200**		**1700**		**1000**		**2800**		**3000**	
Dibenz (a,h) anthracene	SW8270D	115	2110	--	--	µg/kg	**300**		**710**		**390**		**170**		**410**		**550**	
Dibenzofuran	SW8270D	73000	1040000	--	--	µg/kg	350	J	810	J	370	J	180	J	250	J	480	J
Diethyl Phthalate	SW8270D	50600000	100000000	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
Dimethyl Phthalate	SW8270D	--	--	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
Di-n-Butylphthalate	SW8270D	6320000	82100000	5033.259424	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
Di-n-Octyl phthalate	SW8270D	632000	8210000	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM03		ND20-GM03		ND20-GM03		ND20-GM04		ND20-GM04		ND20-GM04	
						Sample ID	ND20-GM03-4060_07/02/2020		ND20-GM03-6080_07/02/2020		ND20-GM03-8010_07/02/2020		ND20-GM04-0320_06/29/2020		ND20-GM04-2040_06/29/2020		ND20-GM04-4060_06/29/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		07-02-2020		06-29-2020		06-29-2020		06-29-2020	
						Sample Depth (ft bss)	4 - 6		6 - 8		8 - 10		0.3 - 2		2 - 4		4 - 6	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	N		N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene	SW8270D	2390000	30100000	88877.80549	--	µg/kg	3900		10000		4500		2500		7600		7300	
Fluorene	SW8270D	2390000	30100000	14829.93197	--	µg/kg	780		1400		550		380		650		910	
Hexachlorobenzene	SW8270D	252	1150	25.2	--	µg/kg	< 100		< 230		< 200		< 59		< 91		< 120	
Hexachlorobutadiene	SW8270D	1630	7190	--	--	µg/kg	< 100		< 230		< 200		< 59		< 91		< 120	
Hexachlorocyclopentadiene	SW8270D	2550	10800	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
Hexachloroethane	SW8270D	2520	11100	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
Indeno (1,2,3-cd) pyrene	SW8270D	1150	21100	--	--	µg/kg	720		**1800**		880		500		**1300**		**1400**	
Isophorone	SW8270D	571000	2420000	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
Naphthalene	SW8270D	5520	24100	658.1818182	--	µg/kg	600		**2000**		**940**		280		290		**1100**	
Nitrobenzene	SW8270D	7420	32400	--	--	µg/kg	< 1000		< 2300		< 2000		< 590		< 910		< 1200	
N-Nitroso-Di-N-Propylamine	SW8270D	77.5	328	--	--	µg/kg	< 100		< 230		< 200		< 59		< 91		< 120	
N-Nitrosodiphenylamine	SW8270D	111000	469000	76.42622951	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
P-Chloroaniline	SW8270D	2710	11500	--	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
Pentachlorophenol	SW8270D	1020	3970	2.76	--	µg/kg	< 2600		< 5800		< 5100		< 1500	UJ	< 2300	UJ	< 3200	UJ
Phenanthrene	SW8270D	--	--	--	--	µg/kg	4100		13000		4400		1900		5800		6800	
Phenol	SW8270D	19000000	100000000	2294.627383	--	µg/kg	< 500		< 1100		< 980		< 290		< 450		< 610	
P-Nitroaniline	SW8270D	27100	115000	--	--	µg/kg	< 2600		< 5800		< 5100		< 1500		< 2300		< 3200	
Pyrene	SW8270D	1790000	22600000	54545.45455	--	µg/kg	3300		10000		4000		2100		6700		5700	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	0.484	2.19	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	0.00493	0.0223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	0.164	0.744	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	0.0164	0.0744	--	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDD	E1613B	0.00482	0.0218	0.03	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDF	E1613B	0.0484	0.219	--	--	µg/kg	-		-		-		-		-		-	
OCDD	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
OCDF	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		-		-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	-		-		-		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		-		-		-		-	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	-		-		-		-		-		-	
Other																		
Moisture	SM2540	--	--	--	--	%	52		64		54		77		81		48	
Total Organic Carbon	SW9060	--	--	--	--	mg/kg	28900		59000		43000		51300		54900		56500	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM04		ND20-GM04		ND20-GM04		ND20-GM05		ND20-GM05		ND20-GM05	
						Sample ID	ND20-GM04-6080_06/29/2020		ND20-GM04-8010_06/29/2020		ND20-GM04-SURF_06/30/2020		ND20-GM05-SURF_06/28/2020		ND20-GM05-0320_07/02/2020		ND20-GM05-2040_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	06-29-2020		06-29-2020		06-30-2020		06-28-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Metals																		
Aluminum	SW6010	77500000	100000000	600000	28721000	µg/kg	**4610000**		**4160000**		**19100000**		**18000000**		**13100000**		**12100000**	
Antimony	SW6010	31300	467000	542	--	µg/kg	< 5900		< 6300		< 16200		**900**	**J**	< 10500		< 8600	
Arsenic	SW6010	677	3000	584	8300	µg/kg	**3200**		**2100**		**6700**		**5700**		**5400**		**5800**	
Barium	SW6010	15300000	100000000	164800	364000	µg/kg	26000		24000		**183000**		159000	*	130000		140000	
Beryllium	SW6010	156000	2300000	6320	--	µg/kg	240	J	210	J	790	J	650	J	550	J	530	J
Cadmium	SW6010	71100	985000	752	1070	µg/kg	200	J	150	J	660	J	540	J	520	J	580	J
Calcium Metal	SW6010	--	--	--	14536000	µg/kg	9160000		**16800000**		11900000		10600000	*	13800000		13500000	
Chromium	SW6010	--	--	360000000	43500	µg/kg	10600		9500		41500		38500	J	30000		28900	
Cobalt	SW6010	23400	347000	3607.321132	22000	µg/kg	**3900**	**J**	3500	J	**12800**	**J**	**12800**		**9700**		**9200**	
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	27900		7800		**47800**		**35600**		34000	*	**39700**	*****
Iron	SW6010	54800000	100000000	--	34314000	µg/kg	11700000		9960000		**36000000**		**34900000**		25400000		24400000	
Lead	SW6010	400000	800000	27000	51600	µg/kg	20300		2800		**29100**		21900		23000	J	**37200**	**J**
Magnesium	SW6010	--	--	--	8290000	µg/kg	3960000		5950000		**11000000**		**10400000**	*****	**9880000**		**9440000**	
Manganese	SW6010	1830000	25900000	39124.42396	2937000	µg/kg	**141000**	*****	**158000**	*****	**1060000**	*****	**1130000**		**592000**		**484000**	
Mercury	SW6010	3130	3130	208	--	µg/kg	< 110		< 120		< 260		< 250		< 210		< 170	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	10300		9800		**32100**		**31400**	**J**	**24200**		**23200**	
Potassium	SW6010	--	--	--	--	µg/kg	477000	J	510000	J	2620000		2290000		1690000		1560000	
Selenium	SW6010	391000	5840000	520	--	µg/kg	< 3400		< 3700		**2100**	**J**	**1400**	**J**	< 6100		**1000**	**J**
Silver	SW6010	391000	5840000	849.0967056	--	µg/kg	< 980		< 1000		< 2700		< 1800		< 1800		< 1400	
Sodium	SW6010	--	--	--	--	µg/kg	221000	J	216000	J	396000	J	350000	J	314000	J	316000	J
Thallium	SW6010	782	11700	284	--	µg/kg	< 2400		< 2600		< 6700		< 4600		< 4400		< 3600	
Vanadium	SW6010	393000	5840000	60000	85000	µg/kg	23200		24000		51900		48200		39500		39400	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	44600		16900		135000		121000	*	118000		136000	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	4110	28000	--	--	µg/kg	-		-		< 96		< 87		< 71		< 65	
Aroclor 1221	SW8081	213	883	--	--	µg/kg	-		-		< 96		< 87		< 71		< 65	
Aroclor 1232	SW8081	190	792	--	--	µg/kg	-		-		< 96		< 87		< 71		< 65	
Aroclor 1242	SW8081	235	972	--	--	µg/kg	-		-		< 96		< 87		< 71		< 65	
Aroclor 1248	SW8081	236	975	--	--	µg/kg	-		-		< 96		< 87		< 71		**500**	
Aroclor 1254	SW8081	239	988	--	--	µg/kg	-		-		21	J	< 87		< 71		< 65	
Aroclor 1260	SW8081	243	1000	--	--	µg/kg	-		-		< 96		15	J	16	J	150	
Aroclor 1262	SW8081	--	--	--	--	µg/kg	-		-		< 96		< 87		< 71		< 65	
Aroclor 1268	SW8081	--	--	--	--	µg/kg	-		-		< 96		< 87		< 71		< 65	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	-		-		**21**		**15**		**16**		**650**	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM04		ND20-GM04		ND20-GM04		ND20-GM05		ND20-GM05		ND20-GM05	
						Sample ID	ND20-GM04-6080_06/29/2020		ND20-GM04-8010_06/29/2020		ND20-GM04-SURF_06/30/2020		ND20-GM05-SURF_06/28/2020		ND20-GM05-0320_07/02/2020		ND20-GM05-2040_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	06-29-2020		06-29-2020		06-30-2020		06-28-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	640000	640000	140.2	--	µg/kg	-		-		< 15		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	810	3600	0.156406869	--	µg/kg	-		-		< 15		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	910000	910000	--	--	µg/kg	-		-		< 15		-		-		-	
1,1,2-Trichloroethane	SW8260	1590	7010	3.24	--	µg/kg	-		-		< 15		-		-		-	
1,1-Dichloroethane	SW8260	5060	22200	483.4181818	--	µg/kg	-		-		< 15		-		-		-	
1,1-Dichloroethene	SW8260	320000	1190000	5.02	--	µg/kg	-		-		< 15		-		-		-	
1,2,4-Trichlorobenzene	SW8260	24000	113000	408	--	µg/kg	-		-		< 15		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	7.5	92.3	0.1728	--	µg/kg	-		-		< 15		-		-		-	
1,2-Dibromoethane	SW8260	50	221	0.0282	--	µg/kg	-		-		< 15		-		-		-	
1,2-Dichlorobenzene	SW8260	376000	376000	1168	--	µg/kg	-		-		< 15		-		-		-	
1,2-Dichloroethane	SW8260	652	2870	2.84	--	µg/kg	-		-		< 15	UJ	-		-		-	
1,2-Dichloropropane	SW8260	3400	15000	3.32	--	µg/kg	-		-		< 15		-		-		-	
1,4-Dichlorobenzene	SW8260	3740	16400	144	--	µg/kg	-		-		< 15		-		-		-	
2-Butanone	SW8260	28400000	28400000	1666.068223	--	µg/kg	-		-		< 15		-		-		-	
2-Hexanone	SW8260	237000	1760000	--	--	µg/kg	-		-		< 15		-		-		-	
4-Methyl-2-pentanone	SW8260	3360000	3360000	225.2396166	--	µg/kg	-		-		< 15		-		-		-	
Acetone	SW8260	63400000	100000000	3676.595745	--	µg/kg	-		-		330	J	-		-		-	
Benzene	SW8260	1600	7070	5.12	--	µg/kg	-		-		< 15		-		-		-	
Bromodichloromethane	SW8260	418	1830	0.3255	--	µg/kg	-		-		< 15		-		-		-	
Bromoform	SW8260	25400	113000	2.332	--	µg/kg	-		-		< 15		-		-		-	
Bromomethane	SW8260	9600	43000	5.059602649	--	µg/kg	-		-		< 15	UJ	-		-		-	
Carbon Disulfide	SW8260	738000	738000	591.8618989	--	µg/kg	-		-		< 15		-		-		-	
Carbon Tetrachloride	SW8260	916	4030	3.88	--	µg/kg	-		-		< 15		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	126000	530000	3086.294416	--	µg/kg	-		-		< 15		-		-		-	
Chlorobenzene	SW8260	370000	761000	135.8	--	µg/kg	-		-		< 15		-		-		-	
Chloroethane	SW8260	2120000	2120000	226.6028708	--	µg/kg	-		-		< 15	UJ	-		-		-	
Chloroform	SW8260	454	1980	3.33	--	µg/kg	-		-		< 15		-		-		-	
Chloromethane	SW8260	159000	669000	15.5106383	--	µg/kg	-		-		< 15		-		-		-	
cis-1,2-Dichloroethene	SW8260	156000	2340000	41.2	--	µg/kg	-		-		< 15		-		-		-	
cis-1,3-Dichloropropene	SW8260	1210000	1210000	--	--	µg/kg	-		-		< 15		-		-		-	
Cyclohexane	SW8260	117000	117000	--	--	µg/kg	-		-		< 15		-		-		-	
Dibromochloromethane	SW8260	8280	38900	31.95	--	µg/kg	-		-		< 15		-		-		-	
Ethylbenzene	SW8260	8020	35400	1570	--	µg/kg	-		-		< 15		-		-		-	
Isopropylbenzene	SW8260	268000	268000	--	--	µg/kg	-		-		< 15		-		-		-	
M-Dichlorobenzene	SW8260	297000	297000	1152.77434	--	µg/kg	-		-		< 15		-		-		-	
Methyl Acetate	SW8260	29000000	29000000	--	--	µg/kg	-		-		< 73		-		-		-	
Methyl tert-Butyl Ether	SW8260	63800	282000	27.02097902	--	µg/kg	-		-		< 15		-		-		-	
Methylcyclohexane	SW8260	67600	67600	--	--	µg/kg	-		-		< 15		-		-		-	
Methylene Chloride	SW8260	61800	1150000	2.56	--	µg/kg	-		-		< 15		-		-		-	
Styrene	SW8260	867000	867000	220	--	µg/kg	-		-		< 15		-		-		-	
Tetrachloroethene	SW8260	33000	145000	4.54	--	µg/kg	-		-		< 15		-		-		-	
Toluene	SW8260	818000	818000	1107.2	--	µg/kg	-		-		< 15		-		-		-	
trans-1,2-Dichloroethene	SW8260	1560000	1850000	62.6	--	µg/kg	-		-		< 15		-		-		-	
trans-1,3-Dichloropropene	SW8260	1510000	1510000	--	--	µg/kg	-		-		< 15		-		-		-	
Trichloroethene	SW8260	1300	8410	3.58	--	µg/kg	-		-		< 15		-		-		-	
Trichlorofluoromethane	SW8260	1230000	1230000	4477.48062	--	µg/kg	-		-		< 15	UJ	-		-		-	
Vinyl Chloride	SW8260	66.8	2080	0.138	--	µg/kg	-		-		< 15		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	µg/kg	-		-		< 15		-		-		-	
o-Xylene	SW8260	434000	434000	--	--	µg/kg	-		-		< 15		-		-		-	
Xylenes (total)	SW8260	260000	260000	3960	--	µg/kg	-		-		< 29		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM04		ND20-GM04		ND20-GM04		ND20-GM05		ND20-GM05		ND20-GM05	
						Sample ID	ND20-GM04-6080_06/29/2020		ND20-GM04-8010_06/29/2020		ND20-GM04-SURF_06/30/2020		ND20-GM05-SURF_06/28/2020		ND20-GM05-0320_07/02/2020		ND20-GM05-2040_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	06-29-2020		06-29-2020		06-30-2020		06-28-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	1020000	1020000	--	--	µg/kg	< 44		< 4.1		< 76		< 90		< 78		< 65	
2,4,5-Trichlorophenol	SW8270D	6320000	82100000	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
2,4,6-Trichlorophenol	SW8270D	49300	209000	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
2,4-Dichlorophenol	SW8270D	190000	2460000	--	--	µg/kg	< 44		< 4.1		< 76		< 90		< 78		< 65	
2,4-Dimethyl Phenol	SW8270D	1260000	16400000	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
2,4-Dinitrophenol	SW8270D	126000	1640000	--	--	µg/kg	< 2200		< 200		< 3800		< 4500		< 3800		< 3200	
2,4-Dinitrotoluene	SW8270D	1740	7370	0.135443038	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
2,6-Dinitrotoluene	SW8270D	363	1540	0.137525773	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
2-Chloronaphthalene	SW8270D	4780000	60300000	--	--	µg/kg	< 44		< 4.1		< 76		< 90		< 78		< 65	
2-Chlorophenol	SW8270D	391000	5840000	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
2-Methylnaphthalene	SW8270D	239000	3010000	--	--	µg/kg	190		0.35	J	68	J	130		62	J	87	
2-Methylphenol	SW8270D	3160000	41000000	--	--	µg/kg	8.1	J	< 20		< 380		< 450		< 380		< 320	
2-Nitroaniline	SW8270D	627000	8010000	--	--	µg/kg	< 1100		< 100		< 1900		< 2300		< 2000		< 1700	
2-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
3,3'-Dichlorobenzidine	SW8270D	1210	5110	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
3-Nitroaniline	SW8270D	--	--	--	--	µg/kg	< 1100		< 100		< 1900		< 2300		< 2000		< 1700	
4,6-Dinitro-2-Methylphenol	SW8270D	5060	65700	--	--	µg/kg	< 1100		< 100		< 1900		< 2300		< 2000		< 1700	
4-Bromodiphenyl ether	SW8270D	26900	26900	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
4-Chloro-3-methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
4-Methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	66	J	< 20		38	J	25	J	16	J	23	J
4-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 1100		< 100		< 1900		< 2300		< 2000		< 1700	
Acenaphthene	SW8270D	3590000	45200000	--	--	µg/kg	220		1.1	J	110		150		92		160	
Acenaphthylene	SW8270D	--	--	--	--	µg/kg	93		< 4.1		73	J	53	J	39	J	49	J
ACETOPHENONE	SW8270D	2520000	2520000	--	--	µg/kg	< 440		< 41		< 760		< 900		< 780		< 650	
Anthracene	SW8270D	17900000	100000000	196949.1525	--	µg/kg	430		< 4.1		250		270		150		240	
ATRAZINE	SW8270D	2360	9990	3.9	--	µg/kg	< 440		< 41		< 760		< 900		< 780		< 650	
BENZALDEHYDE	SW8270D	174000	818000	--	--	µg/kg	< 440		< 41		37	J	< 900		72	J	58	J
Benzo (a) anthracene	SW8270D	1140	20800	--	--	µg/kg	740		< 4.1		520		530		300		470	
Benzo (a) pyrene	SW8270D	115	2110	470	--	µg/kg	**630**		< 4.1		**490**		**470**		**220**		**370**	
Benzo (b) fluoranthene	SW8270D	1150	21100	478.0876494	--	µg/kg	**630**		< 4.1		**570**		**530**		300		**480**	
Benzo (ghi) perylene	SW8270D	--	--	--	--	µg/kg	400		< 4.1		390		320		160		240	
Benzo (k) fluoranthene	SW8270D	11500	211000	--	--	µg/kg	220		< 4.1		270		170		110		180	
Benzo(e)pyrene	SW8270D	--	--	--	--	µg/kg	360		< 20		330	J	290	J	160	J	250	J
Biphenyl	SW8270D	68500	288000	--	--	µg/kg	43	J	< 20		28	J	34	J	18	J	28	J
bis(2-Chloroethoxy) Methane	SW8270D	190000	2460000	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
Bis-(2-Chloroethyl) Ether	SW8270D	286	1290	--	--	µg/kg	< 44		< 4.1		< 76		< 90		< 78		< 65	
bis(2-Ethylhexyl)phthalate	SW8270D	38800	164000	2880	--	µg/kg	< 2200		< 200		49	J	< 4500		< 3800		94	J
Butyl Benzyl Phthalate	SW8270D	286000	1210000	--	--	µg/kg	< 220		< 20		< 380		80	J	< 380		< 320	
Caprolactam	SW8270D	31300000	100000000	--	--	µg/kg	< 1100		< 100		< 1900	UJ	< 2300		< 2000		< 1700	
Carbazole	SW8270D	--	--	--	--	µg/kg	150		< 4.1		71	J	82	J	32	J	80	
Chrysene	SW8270D	115000	2110000	144.2231076	--	µg/kg	**660**		< 4.1		**590**		**530**		**330**		**590**	
Dibenz (a,h) anthracene	SW8270D	115	2110	--	--	µg/kg	**130**		< 4.1		110		**150**		110		110	
Dibenzofuran	SW8270D	73000	1040000	--	--	µg/kg	160	J	0.16	J	94	J	110	J	79	J	130	J
Diethyl Phthalate	SW8270D	50600000	100000000	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
Dimethyl Phthalate	SW8270D	--	--	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
Di-n-Butylphthalate	SW8270D	6320000	82100000	5033.259424	--	µg/kg	< 220		1.6	J	< 380		< 450		< 380		< 320	
Di-n-Octyl phthalate	SW8270D	632000	8210000	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM04		ND20-GM04		ND20-GM04		ND20-GM05		ND20-GM05		ND20-GM05	
						Sample ID	ND20-GM04-6080_06/29/2020		ND20-GM04-8010_06/29/2020		ND20-GM04-SURF_06/30/2020		ND20-GM05-SURF_06/28/2020		ND20-GM05-0320_07/02/2020		ND20-GM05-2040_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	06-29-2020		06-29-2020		06-30-2020		06-28-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene	SW8270D	2390000	30100000	88877.80549	--	µg/kg	1700		0.65	J	1300		1200		740		1400	
Fluorene	SW8270D	2390000	30100000	14829.93197	--	µg/kg	240		< 4.1		170		180		140		250	
Hexachlorobenzene	SW8270D	252	1150	25.2	--	µg/kg	< 44		< 4.1		< 76		< 90		< 78		< 65	
Hexachlorobutadiene	SW8270D	1630	7190	--	--	µg/kg	< 44		< 4.1		< 76		< 90		< 78		< 65	
Hexachlorocyclopentadiene	SW8270D	2550	10800	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
Hexachloroethane	SW8270D	2520	11100	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
Indeno (1,2,3-cd) pyrene	SW8270D	1150	21100	--	--	µg/kg	360		< 4.1		320		300		150		230	
Isophorone	SW8270D	571000	2420000	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
Naphthalene	SW8270D	5520	24100	658.1818182	--	µg/kg	390		< 4.1		86		230		96		160	
Nitrobenzene	SW8270D	7420	32400	--	--	µg/kg	< 440		< 41		< 760		< 900		< 770		< 650	
N-Nitroso-Di-N-Propylamine	SW8270D	77.5	328	--	--	µg/kg	< 44		< 4.1		< 76		< 90		< 78		< 65	
N-Nitrosodiphenylamine	SW8270D	111000	469000	76.42622951	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
P-Chloroaniline	SW8270D	2710	11500	--	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
Pentachlorophenol	SW8270D	1020	3970	2.76	--	µg/kg	< 1100	UJ	< 100	UJ	< 1900		< 2300		< 2000		< 1700	
Phenanthrene	SW8270D	--	--	--	--	µg/kg	1900		0.9	J	670		1000		460		1000	
Phenol	SW8270D	19000000	100000000	2294.627383	--	µg/kg	< 220		< 20		< 380		< 450		< 380		< 320	
P-Nitroaniline	SW8270D	27100	115000	--	--	µg/kg	< 1100		< 100		< 1900		< 2300		< 2000		< 1700	
Pyrene	SW8270D	1790000	22600000	54545.45455	--	µg/kg	1600		0.71	J	900		1100		630		1200	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	0.484	2.19	--	--	µg/kg	-		-		**1.2**		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		0.45		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		0.011		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		0.00691	J	-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		0.016		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		0.03		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		0.017	J	-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		0.018		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		0.0011	J	-		-		-	
1,2,3,7,8-PeCDD	E1613B	0.00493	0.0223	--	--	µg/kg	-		-		0.0035	J	-		-		-	
1,2,3,7,8-PeCDF	E1613B	0.164	0.744	--	--	µg/kg	-		-		0.0028	J	-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		0.0031	J	-		-		-	
2,3,4,7,8-PECDF	E1613B	0.0164	0.0744	--	--	µg/kg	-		-		0.0031	J	-		-		-	
2,3,7,8-TCDD	E1613B	0.00482	0.0218	0.03	--	µg/kg	-		-		0.001	J	-		-		-	
2,3,7,8-TCDF	E1613B	0.0484	0.219	--	--	µg/kg	-		-		0.002		-		-		-	
OCDD	E1613B	16.4	74.4	--	--	µg/kg	-		-		**24**	**J**	-		-		-	
OCDF	E1613B	16.4	74.4	--	--	µg/kg	-		-		0.75		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		< 3.7		< 3.4	UJ	< 2.9		< 2.6	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	-		-		< 59		< 54		< 46		< 42	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		< 4.8		< 4.5		< 3.7		< 3.4	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	-		-		< 4.3		< 3.9		< 3.3		< 3	
Other																		
Moisture	SM2540	--	--	--	--	%	33		21		190		170		120		99	
Total Organic Carbon	SW9060	--	--	--	--	mg/kg	12300		< 1000		65000		46300		47000		56600	

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Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM05		ND20-GM05		ND20-GM06		ND20-GM06		ND20-GM06		ND20-GM06	
						Sample ID	ND20-GM05-4060_07/02/2020		ND20-GM05-6080_07/02/2020		ND20-GM06-SURF_06/28/2020		ND20-GM06-0320_07/02/2020		ND20-GM06-2040_07/02/2020		ND20-GM06-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	4 - 6		6 - 8		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Metals																		
Aluminum	SW6010	77500000	100000000	600000	28721000	µg/kg	**3450000**		**5310000**		**12700000**		**10200000**		**9640000**		**7260000**	
Antimony	SW6010	31300	467000	542	--	µg/kg	< 6200		< 6000		< 9500		< 11600		< 8400		**680**	**J**
Arsenic	SW6010	677	3000	584	8300	µg/kg	**2100**		**2700**		**4700**		**5300**		**4800**		**4800**	
Barium	SW6010	15300000	100000000	164800	364000	µg/kg	21000		37700		125000	*	118000		91500		65300	
Beryllium	SW6010	156000	2300000	6320	--	µg/kg	160	J	250	J	460	J	460	J	470	J	380	J
Cadmium	SW6010	71100	985000	752	1070	µg/kg	150	J	190	J	430	J	520	J	**800**		630	J
Calcium Metal	SW6010	--	--	--	14536000	µg/kg	**18200000**		**32800000**		9850000	*	12300000		13600000		**18300000**	
Chromium	SW6010	--	--	360000000	43500	µg/kg	8800		11700		28000	J	25200		23700	J	18900	
Cobalt	SW6010	23400	347000	3607.321132	22000	µg/kg	3100	J	**4700**	**J**	**9400**		**8000**	**J**	**7700**		**6600**	**J**
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	6300	*	10000	*	**38600**		34900	*	**53800**	*	**36900**	*
Iron	SW6010	54800000	100000000	--	34314000	µg/kg	8440000		11300000		24800000		20900000		20200000		17200000	
Lead	SW6010	400000	800000	27000	51600	µg/kg	2300	J	3400	J	20000		**29400**	**J**	**162000**	**J**	**63700**	**J**
Magnesium	SW6010	--	--	--	8290000	µg/kg	6680000		**12900000**		**8340000**	*	8250000		**8580000**		**9200000**	
Manganese	SW6010	1830000	25900000	39124.42396	2937000	µg/kg	**198000**		**318000**		**508000**		**344000**		**292000**		**282000**	
Mercury	SW6010	3130	3130	208	--	µg/kg	< 120		< 120		< 220		< 180		**220**		**230**	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	9000		12300		**23100**	**J**	**20200**		**20400**		**17800**	
Potassium	SW6010	--	--	--	--	µg/kg	442000	J	774000		1590000		1320000		1200000		943000	
Selenium	SW6010	391000	5840000	520	--	µg/kg	< 3600		< 3500		**1200**	**J**	< 6700		< 4900		< 4900	
Silver	SW6010	391000	5840000	849.0967056	--	µg/kg	< 1000		< 1000		< 1600		< 1900		200	J	< 1400	
Sodium	SW6010	--	--	--	--	µg/kg	169000	J	247000	J	288000	J	287000	J	298000	J	299000	J
Thallium	SW6010	782	11700	284	--	µg/kg	< 2600		< 2500		< 4000		< 4800		< 3500		< 3500	
Vanadium	SW6010	393000	5840000	60000	85000	µg/kg	20000		24500		36700		35900		35400		30500	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	15300		21800		97000	*	116000		**196000**		**162000**	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	4110	28000	--	--	µg/kg	< 40		< 43		-		-		-		-	
Aroclor 1221	SW8081	213	883	--	--	µg/kg	< 40		< 43		-		-		-		-	
Aroclor 1232	SW8081	190	792	--	--	µg/kg	< 40		< 43		-		-		-		-	
Aroclor 1242	SW8081	235	972	--	--	µg/kg	< 40		< 43		-		-		-		-	
Aroclor 1248	SW8081	236	975	--	--	µg/kg	< 40		< 43		-		-		-		-	
Aroclor 1254	SW8081	239	988	--	--	µg/kg	< 40		< 43		-		-		-		-	
Aroclor 1260	SW8081	243	1000	--	--	µg/kg	< 40		< 43		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	µg/kg	< 40		< 43		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	µg/kg	< 40		< 43		-		-		-		-	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	0		0		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM05		ND20-GM05		ND20-GM06		ND20-GM06		ND20-GM06		ND20-GM06	
						Sample ID	ND20-GM05-4060_07/02/2020		ND20-GM05-6080_07/02/2020		ND20-GM06-SURF_06/28/2020		ND20-GM06-0320_07/02/2020		ND20-GM06-2040_07/02/2020		ND20-GM06-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	4 - 6		6 - 8		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	640000	640000	140.2	--	µg/kg	-		-		-		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	810	3600	0.156406869	--	µg/kg	-		-		-		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	910000	910000	--	--	µg/kg	-		-		-		-		-		-	
1,1,2-Trichloroethane	SW8260	1590	7010	3.24	--	µg/kg	-		-		-		-		-		-	
1,1-Dichloroethane	SW8260	5060	22200	483.4181818	--	µg/kg	-		-		-		-		-		-	
1,1-Dichloroethene	SW8260	320000	1190000	5.02	--	µg/kg	-		-		-		-		-		-	
1,2,4-Trichlorobenzene	SW8260	24000	113000	408	--	µg/kg	-		-		-		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	7.5	92.3	0.1728	--	µg/kg	-		-		-		-		-		-	
1,2-Dibromoethane	SW8260	50	221	0.0282	--	µg/kg	-		-		-		-		-		-	
1,2-Dichlorobenzene	SW8260	376000	376000	1168	--	µg/kg	-		-		-		-		-		-	
1,2-Dichloroethane	SW8260	652	2870	2.84	--	µg/kg	-		-		-		-		-		-	
1,2-Dichloropropane	SW8260	3400	15000	3.32	--	µg/kg	-		-		-		-		-		-	
1,4-Dichlorobenzene	SW8260	3740	16400	144	--	µg/kg	-		-		-		-		-		-	
2-Butanone	SW8260	28400000	28400000	1666.068223	--	µg/kg	-		-		-		-		-		-	
2-Hexanone	SW8260	237000	1760000	--	--	µg/kg	-		-		-		-		-		-	
4-Methyl-2-pentanone	SW8260	3360000	3360000	225.2396166	--	µg/kg	-		-		-		-		-		-	
Acetone	SW8260	63400000	100000000	3676.595745	--	µg/kg	-		-		-		-		-		-	
Benzene	SW8260	1600	7070	5.12	--	µg/kg	-		-		-		-		-		-	
Bromodichloromethane	SW8260	418	1830	0.3255	--	µg/kg	-		-		-		-		-		-	
Bromoform	SW8260	25400	113000	2.332	--	µg/kg	-		-		-		-		-		-	
Bromomethane	SW8260	9600	43000	5.059602649	--	µg/kg	-		-		-		-		-		-	
Carbon Disulfide	SW8260	738000	738000	591.8618989	--	µg/kg	-		-		-		-		-		-	
Carbon Tetrachloride	SW8260	916	4030	3.88	--	µg/kg	-		-		-		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	126000	530000	3086.294416	--	µg/kg	-		-		-		-		-		-	
Chlorobenzene	SW8260	370000	761000	135.8	--	µg/kg	-		-		-		-		-		-	
Chloroethane	SW8260	2120000	2120000	226.6028708	--	µg/kg	-		-		-		-		-		-	
Chloroform	SW8260	454	1980	3.33	--	µg/kg	-		-		-		-		-		-	
Chloromethane	SW8260	159000	669000	15.5106383	--	µg/kg	-		-		-		-		-		-	
cis-1,2-Dichloroethene	SW8260	156000	2340000	41.2	--	µg/kg	-		-		-		-		-		-	
cis-1,3-Dichloropropene	SW8260	1210000	1210000	--	--	µg/kg	-		-		-		-		-		-	
Cyclohexane	SW8260	117000	117000	--	--	µg/kg	-		-		-		-		-		-	
Dibromochloromethane	SW8260	8280	38900	31.95	--	µg/kg	-		-		-		-		-		-	
Ethylbenzene	SW8260	8020	35400	1570	--	µg/kg	-		-		-		-		-		-	
Isopropylbenzene	SW8260	268000	268000	--	--	µg/kg	-		-		-		-		-		-	
M-Dichlorobenzene	SW8260	297000	297000	1152.77434	--	µg/kg	-		-		-		-		-		-	
Methyl Acetate	SW8260	29000000	29000000	--	--	µg/kg	-		-		-		-		-		-	
Methyl tert-Butyl Ether	SW8260	63800	282000	27.02097902	--	µg/kg	-		-		-		-		-		-	
Methylcyclohexane	SW8260	67600	67600	--	--	µg/kg	-		-		-		-		-		-	
Methylene Chloride	SW8260	61800	1150000	2.56	--	µg/kg	-		-		-		-		-		-	
Styrene	SW8260	867000	867000	220	--	µg/kg	-		-		-		-		-		-	
Tetrachloroethene	SW8260	33000	145000	4.54	--	µg/kg	-		-		-		-		-		-	
Toluene	SW8260	818000	818000	1107.2	--	µg/kg	-		-		-		-		-		-	
trans-1,2-Dichloroethene	SW8260	1560000	1850000	62.6	--	µg/kg	-		-		-		-		-		-	
trans-1,3-Dichloropropene	SW8260	1510000	1510000	--	--	µg/kg	-		-		-		-		-		-	
Trichloroethene	SW8260	1300	8410	3.58	--	µg/kg	-		-		-		-		-		-	
Trichlorofluoromethane	SW8260	1230000	1230000	4477.48062	--	µg/kg	-		-		-		-		-		-	
Vinyl Chloride	SW8260	66.8	2080	0.138	--	µg/kg	-		-		-		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	µg/kg	-		-		-		-		-		-	
o-Xylene	SW8260	434000	434000	--	--	µg/kg	-		-		-		-		-		-	
Xylenes (total)	SW8260	260000	260000	3960	--	µg/kg	-		-		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM05		ND20-GM05		ND20-GM06		ND20-GM06		ND20-GM06		ND20-GM06	
						Sample ID	ND20-GM05-4060_07/02/2020		ND20-GM05-6080_07/02/2020		ND20-GM06-SURF_06/28/2020		ND20-GM06-0320_07/02/2020		ND20-GM06-2040_07/02/2020		ND20-GM06-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	4 - 6		6 - 8		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	1020000	1020000	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220		< 48	
2,4,5-Trichlorophenol	SW8270D	6320000	82100000	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
2,4,6-Trichlorophenol	SW8270D	49300	209000	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
2,4-Dichlorophenol	SW8270D	190000	2460000	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220		< 48	
2,4-Dimethyl Phenol	SW8270D	1260000	16400000	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
2,4-Dinitrophenol	SW8270D	126000	1640000	--	--	µg/kg	< 210		< 210		< 3800		< 3500		< 11000		< 2300	
2,4-Dinitrotoluene	SW8270D	1740	7370	0.135443038	--	µg/kg	**< 21**		**< 21**		**< 380**		**< 350**		**< 1100**		**< 230**	
2,6-Dinitrotoluene	SW8270D	363	1540	0.137525773	--	µg/kg	**< 21**		**< 21**		**< 380**		**< 350**		**< 1100**		**< 230**	
2-Chloronaphthalene	SW8270D	4780000	60300000	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220		< 48	
2-Chlorophenol	SW8270D	391000	5840000	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
2-Methylnaphthalene	SW8270D	239000	3010000	--	--	µg/kg	0.3	J	< 4.4		46	J	77		600		270	
2-Methylphenol	SW8270D	3160000	41000000	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
2-Nitroaniline	SW8270D	627000	8010000	--	--	µg/kg	< 110		< 110		< 2000		< 1800		< 5600		< 1200	
2-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
3,3'-Dichlorobenzidine	SW8270D	1210	5110	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
3-Nitroaniline	SW8270D	--	--	--	--	µg/kg	< 110		< 110		< 2000		< 1800		< 5600		< 1200	
4,6-Dinitro-2-Methylphenol	SW8270D	5060	65700	--	--	µg/kg	< 110		< 110		< 2000		< 1800		**< 5600**		< 1200	
4-Bromodiphenyl ether	SW8270D	26900	26900	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
4-Chloro-3-methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
4-Methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 21		0.79	J	14	J	44	J	140	J	83	J
4-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 110		< 110		< 2000		< 1800		< 5600		< 1200	
Acenaphthene	SW8270D	3590000	45200000	--	--	µg/kg	0.59	J	< 4.4		56	J	130		1100		360	
Acenaphthylene	SW8270D	--	--	--	--	µg/kg	< 4.3		< 4.4		35	J	48	J	200	J	72	
ACETOPHENONE	SW8270D	2520000	2520000	--	--	µg/kg	< 43		< 44		< 770		< 710		< 2200		< 480	
Anthracene	SW8270D	17900000	100000000	196949.1525	--	µg/kg	0.66	J	< 4.4		110		210		2100		770	
ATRAZINE	SW8270D	2360	9990	3.9	--	µg/kg	**< 43**		**< 44**		**< 770**		**< 710**		**< 2200**		**< 480**	
BENZALDEHYDE	SW8270D	174000	818000	--	--	µg/kg	< 43		1	J	35	J	52	J	< 2200		< 480	UJ
Benzo (a) anthracene	SW8270D	1140	20800	--	--	µg/kg	1.4	J	< 4.4		250		370		**4300**	**J**	1100	
Benzo (a) pyrene	SW8270D	115	2110	470	--	µg/kg	1	J	< 4.4		**200**		**280**		**3500**	**J**	**800**	
Benzo (b) fluoranthene	SW8270D	1150	21100	478.0876494	--	µg/kg	1.4	J	< 4.4		250		350		**3900**	**J**	**880**	
Benzo (ghi) perylene	SW8270D	--	--	--	--	µg/kg	< 4.3		< 4.4		150		190		2000	J	550	
Benzo (k) fluoranthene	SW8270D	11500	211000	--	--	µg/kg	0.17	J	< 4.4		100		150		1400	J	360	
Benzo(e)pyrene	SW8270D	--	--	--	--	µg/kg	0.69	J	< 21		140	J	190	J	2100		510	
Biphenyl	SW8270D	68500	288000	--	--	µg/kg	< 21		< 21		15	J	21	J	130	J	55	J
bis(2-Chloroethoxy) Methane	SW8270D	190000	2460000	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
Bis-(2-Chloroethyl) Ether	SW8270D	286	1290	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220		< 48	
bis(2-Ethylhexyl)phthalate	SW8270D	38800	164000	2880	--	µg/kg	2.2	J	< 210		**< 3800**		**< 3500**		**< 11000**		< 2300	
Butyl Benzyl Phthalate	SW8270D	286000	1210000	--	--	µg/kg	1.6	J	< 21		< 380		< 350		< 1100		< 230	
Caprolactam	SW8270D	31300000	100000000	--	--	µg/kg	< 110		33	J	< 2000		< 1800		< 5600		< 1200	
Carbazole	SW8270D	--	--	--	--	µg/kg	< 4.3		< 4.4		25	J	40	J	760		140	
Chrysene	SW8270D	115000	2110000	144.2231076	--	µg/kg	1.4	J	< 4.4		**270**		**420**		**4700**		**1000**	
Dibenz (a,h) anthracene	SW8270D	115	2110	--	--	µg/kg	< 4.3		< 4.4		100		110		**680**		**180**	
Dibenzofuran	SW8270D	73000	1040000	--	--	µg/kg	0.28	J	< 21		59	J	100	J	610	J	300	
Diethyl Phthalate	SW8270D	50600000	100000000	--	--	µg/kg	< 21		0.72	J	< 380		< 350		< 1100		< 230	
Dimethyl Phthalate	SW8270D	--	--	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
Di-n-Butylphthalate	SW8270D	6320000	82100000	5033.259424	--	µg/kg	0.94	J	1.2	J	< 380		< 350		< 1100		< 230	
Di-n-Octyl phthalate	SW8270D	632000	8210000	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM05		ND20-GM05		ND20-GM06		ND20-GM06		ND20-GM06		ND20-GM06	
						Sample ID	ND20-GM05-4060_07/02/2020		ND20-GM05-6080_07/02/2020		ND20-GM06-SURF_06/28/2020		ND20-GM06-0320_07/02/2020		ND20-GM06-2040_07/02/2020		ND20-GM06-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	4 - 6		6 - 8		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene	SW8270D	2390000	30100000	88877.80549	--	µg/kg	2.5	J	0.45	J	600		990		9800	J	4000	
Fluorene	SW8270D	2390000	30100000	14829.93197	--	µg/kg	0.63	J	< 4.4		89		200		1300		540	
Hexachlorobenzene	SW8270D	252	1150	25.2	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220		< 48	
Hexachlorobutadiene	SW8270D	1630	7190	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220		< 48	
Hexachlorocyclopentadiene	SW8270D	2550	10800	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
Hexachloroethane	SW8270D	2520	11100	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
Indeno (1,2,3-cd) pyrene	SW8270D	1150	21100	--	--	µg/kg	< 4.3		< 4.4		130		170		**1900**	J	470	
Isophorone	SW8270D	571000	2420000	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
Naphthalene	SW8270D	5520	24100	658.1818182	--	µg/kg	< 4.3		< 4.4		73	J	190		**880**		410	
Nitrobenzene	SW8270D	7420	32400	--	--	µg/kg	< 42		< 43		< 770		< 710		< 2200		< 470	
N-Nitroso-Di-N-Propylamine	SW8270D	77.5	328	--	--	µg/kg	< 4.3		< 4.4		< 77		< 71		< 220		< 48	
N-Nitrosodiphenylamine	SW8270D	111000	469000	76.42622951	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
P-Chloroaniline	SW8270D	2710	11500	--	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
Pentachlorophenol	SW8270D	1020	3970	2.76	--	µg/kg	< 110		< 110		< 2000		< 1800		< 5600		< 1200	UJ
Phenanthrene	SW8270D	--	--	--	--	µg/kg	2.7	J	0.65	J	270		580		11000	J	4100	
Phenol	SW8270D	19000000	100000000	2294.627383	--	µg/kg	< 21		< 21		< 380		< 350		< 1100		< 230	
P-Nitroaniline	SW8270D	27100	115000	--	--	µg/kg	< 110		< 110		< 2000		< 1800		< 5600		< 1200	
Pyrene	SW8270D	1790000	22600000	54545.45455	--	µg/kg	2.4	J	< 4.4		500		820		9800	J	3000	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	0.484	2.19	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	0.00493	0.0223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	0.164	0.744	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	0.0164	0.0744	--	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDD	E1613B	0.00482	0.0218	0.03	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDF	E1613B	0.0484	0.219	--	--	µg/kg	-		-		-		-		-		-	
OCDD	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
OCDF	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	µg/kg	< 1.6		< 1.8		-		-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	< 26		< 28		-		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	< 2.1		< 2.3		-		-		-		-	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	< 1.9		< 2		-		-		-		-	
Other																		
Moisture	SM2540	--	--	--	--	%	23		32		130		98		67		55	
Total Organic Carbon	SW9060	--	--	--	--	mg/kg	7880		< 1000		67200		49400		32900		31600	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM06		ND20-GM06		ND20-GM07		ND20-GM07		ND20-GM07		ND20-GM07	
						Sample ID	ND20-GM06-6080_07/02/2020		ND20-GM06-8010_07/02/2020		ND20-GM07-SURF_06/28/2020		ND20-GM07-0320_07/02/2020		ND20-GM07-2040_07/02/2020		ND20-GM07-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Metals																		
Aluminum	SW6010	77500000	100000000	600000	28721000	µg/kg	**7950000**		**9180000**		**11900000**		**10600000**		**9040000**		**6040000**	
Antimony	SW6010	31300	467000	542	--	µg/kg	**740**	**J**	**1100**	**J**	< 10400		< 10000		< 8700		< 7000	
Arsenic	SW6010	677	3000	584	8300	µg/kg	**5200**		**6000**		**4500**		**5100**		**4900**		**3600**	
Barium	SW6010	15300000	100000000	164800	364000	µg/kg	83300		**260000**		138000	*	101000		80300		73700	
Beryllium	SW6010	156000	2300000	6320	--	µg/kg	450	J	500	J	430	J	490	J	510	J	370	J
Cadmium	SW6010	71100	985000	752	1070	µg/kg	**910**		**1200**		420	J	540	J	740		520	J
Calcium Metal	SW6010	--	--	--	14536000	µg/kg	**15000000**		14500000		11500000	*	**15200000**		**20800000**		**18500000**	
Chromium	SW6010	--	--	360000000	43500	µg/kg	20700		23500		26200	J	24400		22000		15000	
Cobalt	SW6010	23400	347000	3607.321132	22000	µg/kg	**6800**	**J**	**7600**		**8500**	**J**	**7900**	**J**	**7400**		**5400**	**J**
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	**44500**	*****	**52200**	*****	33600		**36800**		**47800**		**36200**	
Iron	SW6010	54800000	100000000	--	34314000	µg/kg	19400000		22000000		23800000		21900000		19000000		13600000	
Lead	SW6010	400000	800000	27000	51600	µg/kg	**114000**	**J**	**159000**	**J**	17600		**30500**	*****	**51500**	*****	**56100**	*****
Magnesium	SW6010	--	--	--	8290000	µg/kg	7870000		8210000		**8410000**	*****	**8990000**		**10700000**		**8500000**	
Manganese	SW6010	1830000	25900000	39124.42396	2937000	µg/kg	**259000**		**285000**		**603000**		**396000**		**277000**		**224000**	
Mercury	SW6010	3130	3130	208	--	µg/kg	**270**		**350**		57	J	91	J	**210**		160	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	**17800**		**19600**		**21700**	**J**	**20400**		**19600**		**14200**	
Potassium	SW6010	--	--	--	--	µg/kg	1010000		1180000		1510000		1330000		1190000		866000	
Selenium	SW6010	391000	5840000	520	--	µg/kg	< 5500		**750**	**J**	< 6100		< 5800		< 5100		< 4100	
Silver	SW6010	391000	5840000	849.0967056	--	µg/kg	150	J	200	J	< 1700		< 1700		< 1500		< 1200	
Sodium	SW6010	--	--	--	--	µg/kg	369000	J	485000	J	277000	J	317000	J	312000	J	268000	J
Thallium	SW6010	782	11700	284	--	µg/kg	< 3900		< 3200		< 4300		< 3300		< 3200		< 2600	
Vanadium	SW6010	393000	5840000	60000	85000	µg/kg	30900		34200		34500		37000		35700		28000	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	**215000**		**286000**		91200	*	125000		**192000**		144000	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	4110	28000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1221	SW8081	213	883	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1232	SW8081	190	792	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1242	SW8081	235	972	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1248	SW8081	236	975	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1254	SW8081	239	988	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1260	SW8081	243	1000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	-		-		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM06		ND20-GM06		ND20-GM07		ND20-GM07		ND20-GM07		ND20-GM07	
						Sample ID	ND20-GM06-6080_07/02/2020		ND20-GM06-8010_07/02/2020		ND20-GM07-SURF_06/28/2020		ND20-GM07-0320_07/02/2020		ND20-GM07-2040_07/02/2020		ND20-GM07-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	**N**		**N**		**N**		**N**		**N**		**N**	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	640000	640000	140.2	--	µg/kg	-		-		-		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	810	3600	0.156406869	--	µg/kg	-		-		-		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	910000	910000	--	--	µg/kg	-		-		-		-		-		-	
1,1,2-Trichloroethane	SW8260	1590	7010	3.24	--	µg/kg	-		-		-		-		-		-	
1,1-Dichloroethane	SW8260	5060	22200	483.4181818	--	µg/kg	-		-		-		-		-		-	
1,1-Dichloroethene	SW8260	320000	1190000	5.02	--	µg/kg	-		-		-		-		-		-	
1,2,4-Trichlorobenzene	SW8260	24000	113000	408	--	µg/kg	-		-		-		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	7.5	92.3	0.1728	--	µg/kg	-		-		-		-		-		-	
1,2-Dibromoethane	SW8260	50	221	0.0282	--	µg/kg	-		-		-		-		-		-	
1,2-Dichlorobenzene	SW8260	376000	376000	1168	--	µg/kg	-		-		-		-		-		-	
1,2-Dichloroethane	SW8260	652	2870	2.84	--	µg/kg	-		-		-		-		-		-	
1,2-Dichloropropane	SW8260	3400	15000	3.32	--	µg/kg	-		-		-		-		-		-	
1,4-Dichlorobenzene	SW8260	3740	16400	144	--	µg/kg	-		-		-		-		-		-	
2-Butanone	SW8260	28400000	28400000	1666.068223	--	µg/kg	-		-		-		-		-		-	
2-Hexanone	SW8260	237000	1760000	--	--	µg/kg	-		-		-		-		-		-	
4-Methyl-2-pentanone	SW8260	3360000	3360000	225.2396166	--	µg/kg	-		-		-		-		-		-	
Acetone	SW8260	63400000	100000000	3676.595745	--	µg/kg	-		-		-		-		-		-	
Benzene	SW8260	1600	7070	5.12	--	µg/kg	-		-		-		-		-		-	
Bromodichloromethane	SW8260	418	1830	0.3255	--	µg/kg	-		-		-		-		-		-	
Bromoform	SW8260	25400	113000	2.332	--	µg/kg	-		-		-		-		-		-	
Bromomethane	SW8260	9600	43000	5.059602649	--	µg/kg	-		-		-		-		-		-	
Carbon Disulfide	SW8260	738000	738000	591.8618989	--	µg/kg	-		-		-		-		-		-	
Carbon Tetrachloride	SW8260	916	4030	3.88	--	µg/kg	-		-		-		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	126000	530000	3086.294416	--	µg/kg	-		-		-		-		-		-	
Chlorobenzene	SW8260	370000	761000	135.8	--	µg/kg	-		-		-		-		-		-	
Chloroethane	SW8260	2120000	2120000	226.6028708	--	µg/kg	-		-		-		-		-		-	
Chloroform	SW8260	454	1980	3.33	--	µg/kg	-		-		-		-		-		-	
Chloromethane	SW8260	159000	669000	15.5106383	--	µg/kg	-		-		-		-		-		-	
cis-1,2-Dichloroethene	SW8260	156000	2340000	41.2	--	µg/kg	-		-		-		-		-		-	
cis-1,3-Dichloropropene	SW8260	1210000	1210000	--	--	µg/kg	-		-		-		-		-		-	
Cyclohexane	SW8260	117000	117000	--	--	µg/kg	-		-		-		-		-		-	
Dibromochloromethane	SW8260	8280	38900	31.95	--	µg/kg	-		-		-		-		-		-	
Ethylbenzene	SW8260	8020	35400	1570	--	µg/kg	-		-		-		-		-		-	
Isopropylbenzene	SW8260	268000	268000	--	--	µg/kg	-		-		-		-		-		-	
M-Dichlorobenzene	SW8260	297000	297000	1152.77434	--	µg/kg	-		-		-		-		-		-	
Methyl Acetate	SW8260	29000000	29000000	--	--	µg/kg	-		-		-		-		-		-	
Methyl tert-Butyl Ether	SW8260	63800	282000	27.02097902	--	µg/kg	-		-		-		-		-		-	
Methylcyclohexane	SW8260	67600	67600	--	--	µg/kg	-		-		-		-		-		-	
Methylene Chloride	SW8260	61800	1150000	2.56	--	µg/kg	-		-		-		-		-		-	
Styrene	SW8260	867000	867000	220	--	µg/kg	-		-		-		-		-		-	
Tetrachloroethene	SW8260	33000	145000	4.54	--	µg/kg	-		-		-		-		-		-	
Toluene	SW8260	818000	818000	1107.2	--	µg/kg	-		-		-		-		-		-	
trans-1,2-Dichloroethene	SW8260	1560000	1850000	62.6	--	µg/kg	-		-		-		-		-		-	
trans-1,3-Dichloropropene	SW8260	1510000	1510000	--	--	µg/kg	-		-		-		-		-		-	
Trichloroethene	SW8260	1300	8410	3.58	--	µg/kg	-		-		-		-		-		-	
Trichlorofluoromethane	SW8260	1230000	1230000	4477.48062	--	µg/kg	-		-		-		-		-		-	
Vinyl Chloride	SW8260	66.8	2080	0.138	--	µg/kg	-		-		-		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	µg/kg	-		-		-		-		-		-	
o-Xylene	SW8260	434000	434000	--	--	µg/kg	-		-		-		-		-		-	
Xylenes (total)	SW8260	260000	260000	3960	--	µg/kg	-		-		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM06		ND20-GM06		ND20-GM07		ND20-GM07		ND20-GM07		ND20-GM07	
						Sample ID	ND20-GM06-6080_07/02/2020		ND20-GM06-8010_07/02/2020		ND20-GM07-SURF_06/28/2020		ND20-GM07-0320_07/02/2020		ND20-GM07-2040_07/02/2020		ND20-GM07-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	1020000	1020000	--	--	µg/kg	< 140		< 140		< 79		< 110		< 80		< 180	
2,4,5-Trichlorophenol	SW8270D	6320000	82100000	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
2,4,6-Trichlorophenol	SW8270D	49300	209000	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
2,4-Dichlorophenol	SW8270D	190000	2460000	--	--	µg/kg	< 140		< 140		< 79		< 110		< 80		< 180	
2,4-Dimethyl Phenol	SW8270D	1260000	16400000	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		76	J
2,4-Dinitrophenol	SW8270D	126000	1640000	--	--	µg/kg	< 6700		< 6800		< 3900		< 5400		< 4000		< 9000	
2,4-Dinitrotoluene	SW8270D	1740	7370	0.135443038	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
2,6-Dinitrotoluene	SW8270D	363	1540	0.137525773	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
2-Chloronaphthalene	SW8270D	4780000	60300000	--	--	µg/kg	< 140		< 140		< 79		< 110		< 80		< 180	
2-Chlorophenol	SW8270D	391000	5840000	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
2-Methylnaphthalene	SW8270D	239000	3010000	--	--	µg/kg	970		730		52	J	160		300		3800	
2-Methylphenol	SW8270D	3160000	41000000	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
2-Nitroaniline	SW8270D	627000	8010000	--	--	µg/kg	< 3500		< 3500		< 2000		< 2800		< 2000		< 4600	
2-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
3,3'-Dichlorobenzidine	SW8270D	1210	5110	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
3-Nitroaniline	SW8270D	--	--	--	--	µg/kg	< 3500		< 3500		< 2000		< 2800		< 2000		< 4600	
4,6-Dinitro-2-Methylphenol	SW8270D	5060	65700	--	--	µg/kg	< 3500		< 3500		< 2000		< 2800		< 2000		< 4600	
4-Bromodiphenyl ether	SW8270D	26900	26900	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
4-Chloro-3-methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
4-Methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	200	J	270	J	< 390		49	J	99	J	160	J
4-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 3500		< 3500		< 2000		< 2800		< 2000		< 4600	
Acenaphthene	SW8270D	3590000	45200000	--	--	µg/kg	1100		360		110		330		340		4300	
Acenaphthylene	SW8270D	--	--	--	--	µg/kg	350		160		47	J	56	J	77	J	440	
ACETOPHENONE	SW8270D	2520000	2520000	--	--	µg/kg	< 1400		< 1400		< 790		< 1100		< 800		< 1800	
Anthracene	SW8270D	17900000	100000000	196949.1525	--	µg/kg	1700		910		160		420		590		5900	
ATRAZINE	SW8270D	2360	9990	3.9	--	µg/kg	< 1400		< 1400		< 790		< 1100		< 800		< 1800	
BENZALDEHYDE	SW8270D	174000	818000	--	--	µg/kg	< 1400	UJ	< 1400	UJ	32	J	62	J	< 800		< 1800	
Benzo (a) anthracene	SW8270D	1140	20800	--	--	µg/kg	**2800**		**1500**		300		660		900		**9400**	
Benzo (a) pyrene	SW8270D	115	2110	470	--	µg/kg	**2300**		**1100**		**220**		**470**		**590**		**8000**	
Benzo (b) fluoranthene	SW8270D	1150	21100	478.0876494	--	µg/kg	**2400**		**1200**		320		**680**		**880**		**8600**	
Benzo (ghi) perylene	SW8270D	--	--	--	--	µg/kg	1600		820		140		350		480		5200	
Benzo (k) fluoranthene	SW8270D	11500	211000	--	--	µg/kg	900		550		110		260		290		2100	
Benzo(e)pyrene	SW8270D	--	--	--	--	µg/kg	1400		760		160	J	350	J	470		4600	
Biphenyl	SW8270D	68500	288000	--	--	µg/kg	180	J	110	J	18	J	41	J	55	J	610	J
bis(2-Chloroethoxy) Methane	SW8270D	190000	2460000	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
Bis-(2-Chloroethyl) Ether	SW8270D	286	1290	--	--	µg/kg	< 140		< 140		< 79		< 110		< 80		< 180	
bis(2-Ethylhexyl)phthalate	SW8270D	38800	164000	2880	--	µg/kg	< 6700		< 6800		< 3900		120	J	< 4000		< 9000	
Butyl Benzyl Phthalate	SW8270D	286000	1210000	--	--	µg/kg	< 670		< 680		< 390		6.2	J	< 400		< 900	
Caprolactam	SW8270D	31300000	100000000	--	--	µg/kg	< 3500		< 3500		< 2000		< 2800	UJ	< 2000	UJ	< 4600	UJ
Carbazole	SW8270D	--	--	--	--	µg/kg	590		190		39	J	120		100		2200	
Chrysene	SW8270D	115000	2110000	144.2231076	--	µg/kg	**2600**		**1500**		**350**		**800**		**1100**		**9600**	
Dibenz (a,h) anthracene	SW8270D	115	2110	--	--	µg/kg	**500**		**340**		100		100	J	**140**		**1300**	
Dibenzofuran	SW8270D	73000	1040000	--	--	µg/kg	920		350	J	96	J	220	J	220	J	2000	
Diethyl Phthalate	SW8270D	50600000	100000000	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
Dimethyl Phthalate	SW8270D	--	--	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
Di-n-Butylphthalate	SW8270D	6320000	82100000	5033.259424	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
Di-n-Octyl phthalate	SW8270D	632000	8210000	--	--	µg/kg	< 670		< 680		< 390		< 540	UJ	< 400	UJ	< 900	UJ

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM06		ND20-GM06		ND20-GM07		ND20-GM07		ND20-GM07		ND20-GM07	
						Sample ID	ND20-GM06-6080_07/02/2020		ND20-GM06-8010_07/02/2020		ND20-GM07-SURF_06/28/2020		ND20-GM07-0320_07/02/2020		ND20-GM07-2040_07/02/2020		ND20-GM07-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene	SW8270D	2390000	30100000	88877.80549	--	µg/kg	8100		3700		850		1900		2700		19000	
Fluorene	SW8270D	2390000	30100000	14829.93197	--	µg/kg	1500		520		160		490		400		4700	
Hexachlorobenzene	SW8270D	252	1150	25.2	--	µg/kg	< 140		< 140		< 79		< 110		< 80		< 180	
Hexachlorobutadiene	SW8270D	1630	7190	--	--	µg/kg	< 140		< 140		< 79		< 110		< 80		< 180	
Hexachlorocyclopentadiene	SW8270D	2550	10800	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
Hexachloroethane	SW8270D	2520	11100	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
Indeno (1,2,3-cd) pyrene	SW8270D	1150	21100	--	--	µg/kg	**1400**		700		130		310		380		**4100**	
Isophorone	SW8270D	571000	2420000	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
Naphthalene	SW8270D	5520	24100	658.1818182	--	µg/kg	**1800**		**1100**		81		340		410		**5100**	
Nitrobenzene	SW8270D	7420	32400	--	--	µg/kg	< 1400		< 1400		< 790		< 1100		< 800		< 1800	
N-Nitroso-Di-N-Propylamine	SW8270D	77.5	328	--	--	µg/kg	< 140		< 140		< 79		< 110	UJ	< 80	UJ	< 180	UJ
N-Nitrosodiphenylamine	SW8270D	111000	469000	76.42622951	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
P-Chloroaniline	SW8270D	2710	11500	--	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
Pentachlorophenol	SW8270D	1020	3970	2.76	--	µg/kg	< 3500	UJ	< 3500	UJ	< 2000		< 2800	UJ	< 2000	UJ	< 4600	UJ
Phenanthrene	SW8270D	--	--	--	--	µg/kg	9300		3000		480		1800		2500		26000	
Phenol	SW8270D	19000000	100000000	2294.627383	--	µg/kg	< 670		< 680		< 390		< 540		< 400		< 900	
P-Nitroaniline	SW8270D	27100	115000	--	--	µg/kg	< 3500		< 3500		< 2000		< 2800		< 2000		< 4600	
Pyrene	SW8270D	1790000	22600000	54545.45455	--	µg/kg	6500		3000		680		1700		2400		24000	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	0.484	2.19	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	0.00493	0.0223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	0.164	0.744	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	0.0164	0.0744	--	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDD	E1613B	0.00482	0.0218	0.03	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDF	E1613B	0.0484	0.219	--	--	µg/kg	-		-		-		-		-		-	
OCDD	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
OCDF	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		< 3.1	UJ	< 2.4		< 2.2		< 1.9	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	-		-		< 49		< 38		3.6	J	5.6	J
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		< 4		< 3.1		< 2.8		< 2.5	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	-		-		< 3.5		2.9		< 2.5		< 2.2	
Other																		
Moisture	SM2540	--	--	--	--	%	61		76		140		78		61		44	
Total Organic Carbon	SW9060	--	--	--	--	mg/kg	70000		62300		91300		40700		35300		22400	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM07		ND20-GM07		ND20-GM08		ND20-GM08		ND20-GM08		ND20-GM08	
						Sample ID	ND20-GM07-6080_07/02/2020		ND20-GM07-8010_07/02/2020		ND20-GM08-SURF_06/29/2020		ND20-GM08-0320_07/02/2020		ND20-GM08-2040_07/02/2020		ND20-GM08-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-29-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	N		N		N		N		N		N	
Metals																		
Aluminum	SW6010	77500000	100000000	600000	28721000	µg/kg	**4760000**		**3890000**		**11200000**		**12100000**		**10300000**		**9790000**	
Antimony	SW6010	31300	467000	542	--	µg/kg	< 5100		< 5700		< 9000		**820**	**J**	< 10000		< 7100	
Arsenic	SW6010	677	3000	584	8300	µg/kg	**2800**		**2600**		**4600**		**6300**		**4300**		**4600**	
Barium	SW6010	15300000	100000000	164800	364000	µg/kg	34600		21400		102000		127000		83500		70300	
Beryllium	SW6010	156000	2300000	6320	--	µg/kg	230	J	200	J	490	J	560	J	510	J	490	J
Cadmium	SW6010	71100	985000	752	1070	µg/kg	180	J	140	J	430	J	**810**		**780**	**J**	680	
Calcium Metal	SW6010	--	--	--	14536000	µg/kg	**25100000**		12500000		12100000		**15400000**		**16200000**		**18200000**	
Chromium	SW6010	--	--	360000000	43500	µg/kg	11000		9900		24700		27600		24800		23500	
Cobalt	SW6010	23400	347000	3607.321132	22000	µg/kg	**4400**		**3700**	**J**	**8200**		**9300**		**7500**	**J**	**7900**	
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	10100		7000		31000		**129000**		**45800**		**45200**	
Iron	SW6010	54800000	100000000	--	34314000	µg/kg	10400000		11400000		20800000		23400000		21100000		20600000	
Lead	SW6010	400000	800000	27000	51600	µg/kg	3300	*	2700	*	16800		**111000**	*	**50100**	*	**47500**	*
Magnesium	SW6010	--	--	--	8290000	µg/kg	**9760000**		4630000		**8480000**		**10000000**		**9680000**		**10100000**	
Manganese	SW6010	1830000	25900000	39124.42396	2937000	µg/kg	**268000**		**176000**		**463000**	*	**383000**		**302000**		**320000**	
Mercury	SW6010	3130	3130	208	--	µg/kg	< 120		< 120		56	J	80	J	**220**		190	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	11500		9700		**20200**		**23200**		**20700**		**21500**	
Potassium	SW6010	--	--	--	--	µg/kg	678000		394000	J	1460000		1570000		1330000		1240000	
Selenium	SW6010	391000	5840000	520	--	µg/kg	< 3000		< 3300		**950**	**J**	**1000**	**J**	< 5800		**780**	**J**
Silver	SW6010	391000	5840000	849.0967056	--	µg/kg	< 850		< 950		< 1500		< 1500		460	J	< 1200	
Sodium	SW6010	--	--	--	--	µg/kg	231000	J	214000	J	306000	J	377000	J	279000	J	289000	J
Thallium	SW6010	782	11700	284	--	µg/kg	< 2200		< 2900		< 3800		< 3600		< 3800		< 3500	
Vanadium	SW6010	393000	5840000	60000	85000	µg/kg	24500		29200		35900		42900		35400		36100	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	19300		16600		95100		**315000**		**204000**		**168000**	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	4110	28000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1221	SW8081	213	883	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1232	SW8081	190	792	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1242	SW8081	235	972	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1248	SW8081	236	975	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1254	SW8081	239	988	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1260	SW8081	243	1000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	-		-		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units												
						Location	ND20-GM07		ND20-GM07		ND20-GM08		ND20-GM08		ND20-GM08		ND20-GM08	
						Sample ID	ND20-GM07-6080_07/02/2020		ND20-GM07-8010_07/02/2020		ND20-GM08-SURF_06/29/2020		ND20-GM08-0320_07/02/2020		ND20-GM08-2040_07/02/2020		ND20-GM08-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-29-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
							N		N		N		N		N		N	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	640000	640000	140.2	--	µg/kg	-		-		< 11		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	810	3600	0.156406869	--	µg/kg	-		-		< 11		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	910000	910000	--	--	µg/kg	-		-		< 11		-		-		-	
1,1,2-Trichloroethane	SW8260	1590	7010	3.24	--	µg/kg	-		-		< 11		-		-		-	
1,1-Dichloroethane	SW8260	5060	22200	483.4181818	--	µg/kg	-		-		< 11		-		-		-	
1,1-Dichloroethene	SW8260	320000	1190000	5.02	--	µg/kg	-		-		< 11		-		-		-	
1,2,4-Trichlorobenzene	SW8260	24000	113000	408	--	µg/kg	-		-		< 11		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	7.5	92.3	0.1728	--	µg/kg	-		-		< 11		-		-		-	
1,2-Dibromoethane	SW8260	50	221	0.0282	--	µg/kg	-		-		< 11		-		-		-	
1,2-Dichlorobenzene	SW8260	376000	376000	1168	--	µg/kg	-		-		< 11		-		-		-	
1,2-Dichloroethane	SW8260	652	2870	2.84	--	µg/kg	-		-		< 11	UJ	-		-		-	
1,2-Dichloropropane	SW8260	3400	15000	3.32	--	µg/kg	-		-		< 11		-		-		-	
1,4-Dichlorobenzene	SW8260	3740	16400	144	--	µg/kg	-		-		< 11		-		-		-	
2-Butanone	SW8260	28400000	28400000	1666.068223	--	µg/kg	-		-		< 11		-		-		-	
2-Hexanone	SW8260	237000	1760000	--	--	µg/kg	-		-		< 11		-		-		-	
4-Methyl-2-pentanone	SW8260	3360000	3360000	225.2396166	--	µg/kg	-		-		< 11		-		-		-	
Acetone	SW8260	63400000	100000000	3676.595745	--	µg/kg	-		-		84	J	-		-		-	
Benzene	SW8260	1600	7070	5.12	--	µg/kg	-		-		< 11		-		-		-	
Bromodichloromethane	SW8260	418	1830	0.3255	--	µg/kg	-		-		< 11		-		-		-	
Bromoform	SW8260	25400	113000	2.332	--	µg/kg	-		-		< 11		-		-		-	
Bromomethane	SW8260	9600	43000	5.059602649	--	µg/kg	-		-		< 11	UJ	-		-		-	
Carbon Disulfide	SW8260	738000	738000	591.8618989	--	µg/kg	-		-		< 11		-		-		-	
Carbon Tetrachloride	SW8260	916	4030	3.88	--	µg/kg	-		-		< 11		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	126000	530000	3086.294416	--	µg/kg	-		-		< 11		-		-		-	
Chlorobenzene	SW8260	370000	761000	135.8	--	µg/kg	-		-		< 11		-		-		-	
Chloroethane	SW8260	2120000	2120000	226.6028708	--	µg/kg	-		-		< 11	UJ	-		-		-	
Chloroform	SW8260	454	1980	3.33	--	µg/kg	-		-		< 11		-		-		-	
Chloromethane	SW8260	159000	669000	15.5106383	--	µg/kg	-		-		< 11		-		-		-	
cis-1,2-Dichloroethene	SW8260	156000	2340000	41.2	--	µg/kg	-		-		< 11		-		-		-	
cis-1,3-Dichloropropene	SW8260	1210000	1210000	--	--	µg/kg	-		-		< 11		-		-		-	
Cyclohexane	SW8260	117000	117000	--	--	µg/kg	-		-		< 11		-		-		-	
Dibromochloromethane	SW8260	8280	38900	31.95	--	µg/kg	-		-		< 11		-		-		-	
Ethylbenzene	SW8260	8020	35400	1570	--	µg/kg	-		-		< 11		-		-		-	
Isopropylbenzene	SW8260	268000	268000	--	--	µg/kg	-		-		< 11		-		-		-	
M-Dichlorobenzene	SW8260	297000	297000	1152.77434	--	µg/kg	-		-		< 11		-		-		-	
Methyl Acetate	SW8260	29000000	29000000	--	--	µg/kg	-		-		< 57		-		-		-	
Methyl tert-Butyl Ether	SW8260	63800	282000	27.02097902	--	µg/kg	-		-		< 11		-		-		-	
Methylcyclohexane	SW8260	67600	67600	--	--	µg/kg	-		-		< 11		-		-		-	
Methylene Chloride	SW8260	61800	1150000	2.56	--	µg/kg	-		-		< 11		-		-		-	
Styrene	SW8260	867000	867000	220	--	µg/kg	-		-		< 11		-		-		-	
Tetrachloroethene	SW8260	33000	145000	4.54	--	µg/kg	-		-		< 11		-		-		-	
Toluene	SW8260	818000	818000	1107.2	--	µg/kg	-		-		< 11		-		-		-	
trans-1,2-Dichloroethene	SW8260	1560000	1850000	62.6	--	µg/kg	-		-		< 11		-		-		-	
trans-1,3-Dichloropropene	SW8260	1510000	1510000	--	--	µg/kg	-		-		< 11		-		-		-	
Trichloroethene	SW8260	1300	8410	3.58	--	µg/kg	-		-		< 11		-		-		-	
Trichlorofluoromethane	SW8260	1230000	1230000	4477.48062	--	µg/kg	-		-		< 11	UJ	-		-		-	
Vinyl Chloride	SW8260	66.8	2080	0.138	--	µg/kg	-		-		< 11		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	µg/kg	-		-		< 11		-		-		-	
o-Xylene	SW8260	434000	434000	--	--	µg/kg	-		-		< 11		-		-		-	
Xylenes (total)	SW8260	260000	260000	3960	--	µg/kg	-		-		< 23		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM07		ND20-GM07		ND20-GM08		ND20-GM08		ND20-GM08		ND20-GM08	
						Sample ID	ND20-GM07-6080_07/02/2020		ND20-GM07-8010_07/02/2020		ND20-GM08-SURF_06/29/2020		ND20-GM08-0320_07/02/2020		ND20-GM08-2040_07/02/2020		ND20-GM08-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-29-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	1020000	1020000	--	--	µg/kg	< 4.3		< 4.4		< 33		< 81		< 110		< 100	
2,4,5-Trichlorophenol	SW8270D	6320000	82100000	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
2,4,6-Trichlorophenol	SW8270D	49300	209000	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
2,4-Dichlorophenol	SW8270D	190000	2460000	--	--	µg/kg	< 4.3		< 4.4		< 33		< 81		< 110		< 100	
2,4-Dimethyl Phenol	SW8270D	1260000	16400000	--	--	µg/kg	< 21		< 22		11	J	< 400		< 560		< 490	
2,4-Dinitrophenol	SW8270D	126000	1640000	--	--	µg/kg	< 210		< 220		< 1600		< 4000		< 5600		< 4900	
2,4-Dinitrotoluene	SW8270D	1740	7370	0.135443038	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
2,6-Dinitrotoluene	SW8270D	363	1540	0.137525773	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
2-Chloronaphthalene	SW8270D	4780000	60300000	--	--	µg/kg	< 4.3		< 4.4		< 33		< 81		< 110		< 100	
2-Chlorophenol	SW8270D	391000	5840000	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
2-Methylnaphthalene	SW8270D	239000	3010000	--	--	µg/kg	0.29	J	< 4.4		74		180		2200		520	
2-Methylphenol	SW8270D	3160000	41000000	--	--	µg/kg	< 21		< 22		4.7	J	< 400		< 560		< 490	
2-Nitroaniline	SW8270D	627000	8010000	--	--	µg/kg	< 110		< 110		< 830		< 2100		< 2900		< 2500	
2-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
3,3'-Dichlorobenzidine	SW8270D	1210	5110	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
3-Nitroaniline	SW8270D	--	--	--	--	µg/kg	< 110		< 110		< 830		< 2100		< 2900		< 2500	
4,6-Dinitro-2-Methylphenol	SW8270D	5060	65700	--	--	µg/kg	< 110		< 110		< 830		< 2100		< 2900		< 2500	
4-Bromodiphenyl ether	SW8270D	26900	26900	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
4-Chloro-3-methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
4-Methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 21		< 22		22	J	56	J	110	J	90	J
4-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 110		< 110		< 830		< 2100		< 2900		< 2500	
Acenaphthene	SW8270D	3590000	45200000	--	--	µg/kg	< 4.3		< 4.4		45		2700		330		520	
Acenaphthylene	SW8270D	--	--	--	--	µg/kg	< 4.3		< 4.4		26	J	47	J	82	J	54	J
ACETOPHENONE	SW8270D	2520000	2520000	--	--	µg/kg	< 43		< 44		8.2	J	< 810		< 1100		< 1000	
Anthracene	SW8270D	17900000	100000000	196949.1525	--	µg/kg	0.46	J	< 4.4		87		710		540		580	
ATRAZINE	SW8270D	2360	9990	3.9	--	µg/kg	< 43		< 44		< 330		< 810		< 1100		< 1000	
BENZALDEHYDE	SW8270D	174000	818000	--	--	µg/kg	< 43		< 44		30	J	35	J	< 1100		< 1000	
Benzo (a) anthracene	SW8270D	1140	20800	--	--	µg/kg	< 4.3		< 4.4		200		550		1100		950	
Benzo (a) pyrene	SW8270D	115	2110	470	--	µg/kg	< 4.3		< 4.4		**170**		**400**		**720**		**620**	
Benzo (b) fluoranthene	SW8270D	1150	21100	478.0876494	--	µg/kg	< 4.3		< 4.4		230		**520**		**990**		**880**	
Benzo (ghi) perylene	SW8270D	--	--	--	--	µg/kg	< 4.3		< 4.4		120		300		530		460	
Benzo (k) fluoranthene	SW8270D	11500	211000	--	--	µg/kg	< 4.3		< 4.4		84		220		340		240	
Benzo(e)pyrene	SW8270D	--	--	--	--	µg/kg	< 21		< 22		120	J	280	J	530	J	440	J
Biphenyl	SW8270D	68500	288000	--	--	µg/kg	< 21		< 22		16	J	39	J	57	J	69	J
bis(2-Chloroethoxy) Methane	SW8270D	190000	2460000	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
Bis-(2-Chloroethyl) Ether	SW8270D	286	1290	--	--	µg/kg	< 4.3		< 4.4		< 33		< 81		< 110		< 100	
bis(2-Ethylhexyl)phthalate	SW8270D	38800	164000	2880	--	µg/kg	< 210		< 220		< 1600		69	J	63	J	< 4900	
Butyl Benzyl Phthalate	SW8270D	286000	1210000	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
Caprolactam	SW8270D	31300000	100000000	--	--	µg/kg	< 110	UJ	< 110	UJ	< 830		< 2100	UJ	< 2900	UJ	< 2500	UJ
Carbazole	SW8270D	--	--	--	--	µg/kg	< 4.3		< 4.4		28	J	78	J	110	J	130	
Chrysene	SW8270D	115000	2110000	144.2231076	--	µg/kg	< 4.3		< 4.4		**230**		**650**		**1400**		**1100**	
Dibenz (a,h) anthracene	SW8270D	115	2110	--	--	µg/kg	< 4.3		< 4.4		56		88		**140**		**130**	
Dibenzofuran	SW8270D	73000	1040000	--	--	µg/kg	0.24	J	< 22		54	J	1100		250	J	370	J
Diethyl Phthalate	SW8270D	50600000	100000000	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
Dimethyl Phthalate	SW8270D	--	--	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
Di-n-Butylphthalate	SW8270D	6320000	82100000	5033.259424	--	µg/kg	0.9	J	0.98	J	< 160		< 400		< 560		< 490	
Di-n-Octyl phthalate	SW8270D	632000	8210000	--	--	µg/kg	< 21	UJ	< 22	UJ	< 160		< 400	UJ	< 560	UJ	< 490	UJ

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM07		ND20-GM07		ND20-GM08		ND20-GM08		ND20-GM08		ND20-GM08	
						Sample ID	ND20-GM07-6080_07/02/2020		ND20-GM07-8010_07/02/2020		ND20-GM08-SURF_06/29/2020		ND20-GM08-0320_07/02/2020		ND20-GM08-2040_07/02/2020		ND20-GM08-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-29-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	N		N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene	SW8270D	2390000	30100000	88877.80549	--	µg/kg	1.1	J	< 4.4		450		1900		2600		2500	
Fluorene	SW8270D	2390000	30100000	14829.93197	--	µg/kg	0.45	J	< 4.4		78		2500		430		600	
Hexachlorobenzene	SW8270D	252	1150	25.2	--	µg/kg	< 4.3		< 4.4		< 33		< 81		< 110		< 100	
Hexachlorobutadiene	SW8270D	1630	7190	--	--	µg/kg	< 4.3		< 4.4		< 33		< 81		< 110		< 100	
Hexachlorocyclopentadiene	SW8270D	2550	10800	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
Hexachloroethane	SW8270D	2520	11100	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
Indeno (1,2,3-cd) pyrene	SW8270D	1150	21100	--	--	µg/kg	< 4.3		< 4.4		110		250		430		360	
Isophorone	SW8270D	571000	2420000	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
Naphthalene	SW8270D	5520	24100	658.1818182	--	µg/kg	< 4.3		< 4.4		110		240		380		460	
Nitrobenzene	SW8270D	7420	32400	--	--	µg/kg	< 43		< 44		< 330		< 800		< 1100		< 1000	
N-Nitroso-Di-N-Propylamine	SW8270D	77.5	328	--	--	µg/kg	< 4.3	UJ	< 4.4	UJ	< 33		< 81	UJ	< 110	UJ	< 100	UJ
N-Nitrosodiphenylamine	SW8270D	111000	469000	76.42622951	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
P-Chloroaniline	SW8270D	2710	11500	--	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
Pentachlorophenol	SW8270D	1020	3970	2.76	--	µg/kg	< 110	UJ	< 110	UJ	< 830	UJ	< 2100	UJ	< 2900	UJ	< 2500	UJ
Phenanthrene	SW8270D	--	--	--	--	µg/kg	1.9	J	0.56	J	230		5000		2100		2600	
Phenol	SW8270D	19000000	100000000	2294.627383	--	µg/kg	< 21		< 22		< 160		< 400		< 560		< 490	
P-Nitroaniline	SW8270D	27100	115000	--	--	µg/kg	< 110		< 110		< 830		< 2100		< 2900		< 2500	
Pyrene	SW8270D	1790000	22600000	54545.45455	--	µg/kg	1.4	J	< 4.4		390		1800		2600		2400	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	0.484	2.19	--	--	µg/kg	-		-		0.29		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		0.19		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		0.00304	J	-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		0.00206	J	-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		0.0045	J	-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		0.0092		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		0.0056		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		0.0066		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		< 0.0049		-		-		-	
1,2,3,7,8-PeCDD	E1613B	0.00493	0.0223	--	--	µg/kg	-		-		0.0015	J	-		-		-	
1,2,3,7,8-PeCDF	E1613B	0.164	0.744	--	--	µg/kg	-		-		0.00087	J	-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		0.0013	J	-		-		-	
2,3,4,7,8-PECDF	E1613B	0.0164	0.0744	--	--	µg/kg	-		-		0.00115	J	-		-		-	
2,3,7,8-TCDD	E1613B	0.00482	0.0218	0.03	--	µg/kg	-		-		0.00067	J	-		-		-	
2,3,7,8-TCDF	E1613B	0.0484	0.219	--	--	µg/kg	-		-		0.0016		-		-		-	
OCDD	E1613B	16.4	74.4	--	--	µg/kg	-		-		3.8		-		-		-	
OCDF	E1613B	16.4	74.4	--	--	µg/kg	-		-		0.17		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	µg/kg	< 1.6		< 1.6		< 2.5		-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	< 25		< 25		< 40		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	< 2		< 2		< 3.3		-		-		-	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	< 1.8		< 1.8		< 2.9		-		-		-	
Other																		
Moisture	SM2540	--	--	--	--	%	23		21		94		58		70		52	
Total Organic Carbon	SW9060	--	--	--	--	mg/kg	6010		< 1000		39300		33300		44400		22800	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM08		ND20-GM08		ND20-GM09		ND20-GM09		ND20-GM09		ND20-GM09	
						Sample ID	ND20-GM08-6080_07/02/2020		ND20-GM08-8010_07/02/2020		ND20-GM09-SURF_06/28/2020		ND20-GM09-0320_07/02/2020		ND20-GM09-2040_07/02/2020		ND20-GM09-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Metals																		
Aluminum	SW6010	77500000	100000000	600000	28721000	µg/kg	**4600000**		**4020000**		**11500000**		**11300000**		**8740000**		**5250000**	
Antimony	SW6010	31300	467000	542	--	µg/kg	< 7000		< 5400		< 9100		< 10500		< 6900		< 6600	
Arsenic	SW6010	677	3000	584	8300	µg/kg	**2200**		**2000**		**4300**		**4200**		**4200**		**3300**	
Barium	SW6010	15300000	100000000	164800	364000	µg/kg	30500		30200		95400	*	105000		78600		39400	
Beryllium	SW6010	156000	2300000	6320	--	µg/kg	230	J	190	J	410	J	490	J	400	J	270	J
Cadmium	SW6010	71100	985000	752	1070	µg/kg	210	J	150	J	380	J	390	J	420	J	270	J
Calcium Metal	SW6010	--	--	--	14536000	µg/kg	**20600000**		**22900000**		10800000	*	13500000		**14800000**		**15300000**	
Chromium	SW6010	--	--	360000000	43500	µg/kg	11200		9900		25300	J	24800		22600		13600	
Cobalt	SW6010	23400	347000	3607.321132	22000	µg/kg	**3800**	**J**	3500	J	**8500**		**7900**	**J**	**7100**		**4800**	**J**
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	11400		6600		22500		22200		21600	*	22400	*
Iron	SW6010	54800000	100000000	--	34314000	µg/kg	10900000		9860000		22600000		22300000		18300000		14000000	
Lead	SW6010	400000	800000	27000	51600	µg/kg	7200	*	2700	*	14200		16100	*	21900	J	18000	J
Magnesium	SW6010	--	--	--	8290000	µg/kg	7750000		**8600000**		8050000	*	**8770000**		8280000		6420000	
Manganese	SW6010	1830000	25900000	39124.42396	2937000	µg/kg	**228000**		**215000**		**747000**		**663000**		**410000**		**231000**	
Mercury	SW6010	3130	3130	208	--	µg/kg	< 120		< 110		< 200		58	J	< 150		< 120	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	10700		9600		**20700**	**J**	**20200**		**17200**		12900	
Potassium	SW6010	--	--	--	--	µg/kg	595000		539000		1460000		1480000		1120000		623000	
Selenium	SW6010	391000	5840000	520	--	µg/kg	< 4100		< 3200		< 5300		**1200**	**J**	< 4000		< 3800	
Silver	SW6010	391000	5840000	849.0967056	--	µg/kg	< 1200		< 900		< 1500		< 1800		< 1200		< 1100	
Sodium	SW6010	--	--	--	--	µg/kg	219000	J	197000	J	275000	J	288000	J	276000	J	214000	J
Thallium	SW6010	782	11700	284	--	µg/kg	< 2600		< 2800		< 3800		< 3500		< 2900		< 2700	
Vanadium	SW6010	393000	5840000	60000	85000	µg/kg	25200		22800		35800		35200		33100		28400	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	31300		16500		80200	*	82400		96500		66300	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	4110	28000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1221	SW8081	213	883	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1232	SW8081	190	792	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1242	SW8081	235	972	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1248	SW8081	236	975	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1254	SW8081	239	988	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1260	SW8081	243	1000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	-		-		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM08	ND20-GM08	ND20-GM09	ND20-GM09	ND20-GM09	ND20-GM09
						Sample ID	ND20-GM08-6080_07/02/2020	ND20-GM08-8010_07/02/2020	ND20-GM09-SURF_06/28/2020	ND20-GM09-0320_07/02/2020	ND20-GM09-2040_07/02/2020	ND20-GM09-4060_07/02/2020
						Parent Sample ID	--	--	--	--	--	--
						Date	07-02-2020	07-02-2020	06-28-2020	07-02-2020	07-02-2020	07-02-2020
						Sample Depth (ft bss)	6 - 8	8 - 10	0 - 0.3	0.3 - 2	2 - 4	4 - 6
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N	N	N	N	N	N
Volatile Organic Compounds												
1,1,1-Trichloroethane	SW8260	640000	640000	140.2	--	µg/kg	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	SW8260	810	3600	0.156406869	--	µg/kg	-	-	-	-	-	-
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	910000	910000	--	--	µg/kg	-	-	-	-	-	-
1,1,2-Trichloroethane	SW8260	1590	7010	3.24	--	µg/kg	-	-	-	-	-	-
1,1-Dichloroethane	SW8260	5060	22200	483.4181818	--	µg/kg	-	-	-	-	-	-
1,1-Dichloroethene	SW8260	320000	1190000	5.02	--	µg/kg	-	-	-	-	-	-
1,2,4-Trichlorobenzene	SW8260	24000	113000	408	--	µg/kg	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	7.5	92.3	0.1728	--	µg/kg	-	-	-	-	-	-
1,2-Dibromoethane	SW8260	50	221	0.0282	--	µg/kg	-	-	-	-	-	-
1,2-Dichlorobenzene	SW8260	376000	376000	1168	--	µg/kg	-	-	-	-	-	-
1,2-Dichloroethane	SW8260	652	2870	2.84	--	µg/kg	-	-	-	-	-	-
1,2-Dichloropropane	SW8260	3400	15000	3.32	--	µg/kg	-	-	-	-	-	-
1,4-Dichlorobenzene	SW8260	3740	16400	144	--	µg/kg	-	-	-	-	-	-
2-Butanone	SW8260	28400000	28400000	1666.068223	--	µg/kg	-	-	-	-	-	-
2-Hexanone	SW8260	237000	1760000	--	--	µg/kg	-	-	-	-	-	-
4-Methyl-2-pentanone	SW8260	3360000	3360000	225.2396166	--	µg/kg	-	-	-	-	-	-
Acetone	SW8260	63400000	100000000	3676.595745	--	µg/kg	-	-	-	-	-	-
Benzene	SW8260	1600	7070	5.12	--	µg/kg	-	-	-	-	-	-
Bromodichloromethane	SW8260	418	1830	0.3255	--	µg/kg	-	-	-	-	-	-
Bromoform	SW8260	25400	113000	2.332	--	µg/kg	-	-	-	-	-	-
Bromomethane	SW8260	9600	43000	5.059602649	--	µg/kg	-	-	-	-	-	-
Carbon Disulfide	SW8260	738000	738000	591.8618989	--	µg/kg	-	-	-	-	-	-
Carbon Tetrachloride	SW8260	916	4030	3.88	--	µg/kg	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	SW8260	126000	530000	3086.294416	--	µg/kg	-	-	-	-	-	-
Chlorobenzene	SW8260	370000	761000	135.8	--	µg/kg	-	-	-	-	-	-
Chloroethane	SW8260	2120000	2120000	226.6028708	--	µg/kg	-	-	-	-	-	-
Chloroform	SW8260	454	1980	3.33	--	µg/kg	-	-	-	-	-	-
Chloromethane	SW8260	159000	669000	15.5106383	--	µg/kg	-	-	-	-	-	-
cis-1,2-Dichloroethene	SW8260	156000	2340000	41.2	--	µg/kg	-	-	-	-	-	-
cis-1,3-Dichloropropene	SW8260	1210000	1210000	--	--	µg/kg	-	-	-	-	-	-
Cyclohexane	SW8260	117000	117000	--	--	µg/kg	-	-	-	-	-	-
Dibromochloromethane	SW8260	8280	38900	31.95	--	µg/kg	-	-	-	-	-	-
Ethylbenzene	SW8260	8020	35400	1570	--	µg/kg	-	-	-	-	-	-
Isopropylbenzene	SW8260	268000	268000	--	--	µg/kg	-	-	-	-	-	-
M-Dichlorobenzene	SW8260	297000	297000	1152.77434	--	µg/kg	-	-	-	-	-	-
Methyl Acetate	SW8260	29000000	29000000	--	--	µg/kg	-	-	-	-	-	-
Methyl tert-Butyl Ether	SW8260	63800	282000	27.02097902	--	µg/kg	-	-	-	-	-	-
Methylcyclohexane	SW8260	67600	67600	--	--	µg/kg	-	-	-	-	-	-
Methylene Chloride	SW8260	61800	1150000	2.56	--	µg/kg	-	-	-	-	-	-
Styrene	SW8260	867000	867000	220	--	µg/kg	-	-	-	-	-	-
Tetrachloroethene	SW8260	33000	145000	4.54	--	µg/kg	-	-	-	-	-	-
Toluene	SW8260	818000	818000	1107.2	--	µg/kg	-	-	-	-	-	-
trans-1,2-Dichloroethene	SW8260	1560000	1850000	62.6	--	µg/kg	-	-	-	-	-	-
trans-1,3-Dichloropropene	SW8260	1510000	1510000	--	--	µg/kg	-	-	-	-	-	-
Trichloroethene	SW8260	1300	8410	3.58	--	µg/kg	-	-	-	-	-	-
Trichlorofluoromethane	SW8260	1230000	1230000	4477.48062	--	µg/kg	-	-	-	-	-	-
Vinyl Chloride	SW8260	66.8	2080	0.138	--	µg/kg	-	-	-	-	-	-
m,p-Xylene	SW8260	--	--	--	--	µg/kg	-	-	-	-	-	-
o-Xylene	SW8260	434000	434000	--	--	µg/kg	-	-	-	-	-	-
Xylenes (total)	SW8260	260000	260000	3960	--	µg/kg	-	-	-	-	-	-

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM08		ND20-GM08		ND20-GM09		ND20-GM09		ND20-GM09		ND20-GM09	
						Sample ID	ND20-GM08-6080_07/02/2020		ND20-GM08-8010_07/02/2020		ND20-GM09-SURF_06/28/2020		ND20-GM09-0320_07/02/2020		ND20-GM09-2040_07/02/2020		ND20-GM09-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	1020000	1020000	--	--	µg/kg	< 8.9		< 4.1		< 72		< 70		< 150		< 48	
2,4,5-Trichlorophenol	SW8270D	6320000	82100000	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
2,4,6-Trichlorophenol	SW8270D	49300	209000	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
2,4-Dichlorophenol	SW8270D	190000	2460000	--	--	µg/kg	< 8.9		< 4.1		< 72		< 70		< 150		< 48	
2,4-Dimethyl Phenol	SW8270D	1260000	16400000	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
2,4-Dinitrophenol	SW8270D	126000	1640000	--	--	µg/kg	< 440		< 200		< 3600		< 3500		< 7200		< 2400	
2,4-Dinitrotoluene	SW8270D	1740	7370	0.135443038	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
2,6-Dinitrotoluene	SW8270D	363	1540	0.137525773	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
2-Chloronaphthalene	SW8270D	4780000	60300000	--	--	µg/kg	< 8.9		< 4.1		< 72		< 70		< 150		< 48	
2-Chlorophenol	SW8270D	391000	5840000	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
2-Methylnaphthalene	SW8270D	239000	3010000	--	--	µg/kg	36		0.25	J	47	J	83		92	J	75	
2-Methylphenol	SW8270D	3160000	41000000	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
2-Nitroaniline	SW8270D	627000	8010000	--	--	µg/kg	< 230		< 100		< 1800		< 1800		< 3700		< 1200	
2-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
3,3'-Dichlorobenzidine	SW8270D	1210	5110	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
3-Nitroaniline	SW8270D	--	--	--	--	µg/kg	< 230		< 100		< 1800		< 1800		< 3700		< 1200	
4,6-Dinitro-2-Methylphenol	SW8270D	5060	65700	--	--	µg/kg	< 230		< 100		< 1800		< 1800		< 3700		< 1200	
4-Bromodiphenyl ether	SW8270D	26900	26900	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
4-Chloro-3-methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
4-Methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	7.3	J	< 20		19	J	22	J	33	J	37	J
4-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 230		< 100		< 1800		< 1800		< 3700		< 1200	
Acenaphthene	SW8270D	3590000	45200000	--	--	µg/kg	33		< 4.1		54	J	150		200		160	
Acenaphthylene	SW8270D	--	--	--	--	µg/kg	4.4	J	< 4.1		22	J	38	J	55	J	64	
ACETOPHENONE	SW8270D	2520000	2520000	--	--	µg/kg	< 89		< 41		< 720		< 700		< 1500		< 480	
Anthracene	SW8270D	17900000	100000000	196949.1525	--	µg/kg	52		< 4.1		80		270		420		300	
ATRAZINE	SW8270D	2360	9990	3.9	--	µg/kg	< 89		< 41		< 720		< 700		< 1500		< 480	
BENZALDEHYDE	SW8270D	174000	818000	--	--	µg/kg	< 89		0.84	J	< 720		41	J	50	J-	< 480	UJ
Benzo (a) anthracene	SW8270D	1140	20800	--	--	µg/kg	72		< 4.1		170		370		580		560	
Benzo (a) pyrene	SW8270D	115	2110	470	--	µg/kg	43		< 4.1		**140**		**310**		**590**		**410**	
Benzo (b) fluoranthene	SW8270D	1150	21100	478.0876494	--	µg/kg	57		< 4.1		170		400		**530**		470	
Benzo (ghi) perylene	SW8270D	--	--	--	--	µg/kg	32		< 4.1		96		210		610		270	
Benzo (k) fluoranthene	SW8270D	11500	211000	--	--	µg/kg	22		< 4.1		58	J	140		190		180	
Benzo(e)pyrene	SW8270D	--	--	--	--	µg/kg	32	J	< 20		95	J	190	J	510	J	260	
Biphenyl	SW8270D	68500	288000	--	--	µg/kg	5.1	J	< 20		11	J	30	J	28	J	17	J
bis(2-Chloroethoxy) Methane	SW8270D	190000	2460000	--	--	µg/kg	< 44		< 20		< 360		< 350	UJ	< 720		< 240	
Bis-(2-Chloroethyl) Ether	SW8270D	286	1290	--	--	µg/kg	< 8.9		< 4.1		< 72		< 70		< 150		< 48	
bis(2-Ethylhexyl)phthalate	SW8270D	38800	164000	2880	--	µg/kg	< 440		2	J	< 3600		< 3500		< 7200		46	J
Butyl Benzyl Phthalate	SW8270D	286000	1210000	--	--	µg/kg	< 44		1.3	J	< 360		< 350		< 720		< 240	
Caprolactam	SW8270D	31300000	100000000	--	--	µg/kg	< 230	UJ	< 100	UJ	< 1800		< 1800		< 3700		< 1200	
Carbazole	SW8270D	--	--	--	--	µg/kg	5	J	< 4.1		23	J	83		110	J	53	
Chrysene	SW8270D	115000	2110000	144.2231076	--	µg/kg	76		< 4.1		**190**		**400**		**770**		**560**	
Dibenz (a,h) anthracene	SW8270D	115	2110	--	--	µg/kg	7.9	J	< 4.1		80		61	J	**240**		110	
Dibenzofuran	SW8270D	73000	1040000	--	--	µg/kg	25	J	0.21	J	46	J	140	J	170	J	85	J
Diethyl Phthalate	SW8270D	50600000	100000000	--	--	µg/kg	< 44		< 20		13	J	< 350		< 720		< 240	
Dimethyl Phthalate	SW8270D	--	--	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
Di-n-Butylphthalate	SW8270D	6320000	82100000	5033.259424	--	µg/kg	< 44		1.5	J	< 360		17	J	< 720		< 240	
Di-n-Octyl phthalate	SW8270D	632000	8210000	--	--	µg/kg	< 44	UJ	< 20	UJ	< 360		< 350		< 720		< 240	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM08		ND20-GM08		ND20-GM09		ND20-GM09		ND20-GM09		ND20-GM09	
						Sample ID	ND20-GM08-6080_07/02/2020		ND20-GM08-8010_07/02/2020		ND20-GM09-SURF_06/28/2020		ND20-GM09-0320_07/02/2020		ND20-GM09-2040_07/02/2020		ND20-GM09-4060_07/02/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	**N**		**N**		**N**		**N**		**N**		**N**	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene	SW8270D	2390000	30100000	88877.80549	--	µg/kg	220		< 4.1		380		910		1400		1400	
Fluorene	SW8270D	2390000	30100000	14829.93197	--	µg/kg	46		< 4.1		67	J	210		250		210	
Hexachlorobenzene	SW8270D	252	1150	25.2	--	µg/kg	< 8.9		< 4.1		< 72		< 70		< 150		< 48	
Hexachlorobutadiene	SW8270D	1630	7190	--	--	µg/kg	< 8.9		< 4.1		< 72		< 70		< 150		< 48	
Hexachlorocyclopentadiene	SW8270D	2550	10800	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
Hexachloroethane	SW8270D	2520	11100	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
Indeno (1,2,3-cd) pyrene	SW8270D	1150	21100	--	--	µg/kg	26		< 4.1		89		210		330		250	
Isophorone	SW8270D	571000	2420000	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
Naphthalene	SW8270D	5520	24100	658.1818182	--	µg/kg	32		< 4.1		80		170		200		110	
Nitrobenzene	SW8270D	7420	32400	--	--	µg/kg	< 89		< 41		< 720		< 700		< 1400		< 480	
N-Nitroso-Di-N-Propylamine	SW8270D	77.5	328	--	--	µg/kg	< 8.9	UJ	< 4.1	UJ	< 72		< 70		< 150		< 48	
N-Nitrosodiphenylamine	SW8270D	111000	469000	76.42622951	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
P-Chloroaniline	SW8270D	2710	11500	--	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
Pentachlorophenol	SW8270D	1020	3970	2.76	--	µg/kg	< 230	UJ	< 100	UJ	< 1800		< 1800	UJ	< 3700	UJ	< 1200	UJ
Phenanthrene	SW8270D	--	--	--	--	µg/kg	250		1	J	250		750		1300		1100	
Phenol	SW8270D	19000000	100000000	2294.627383	--	µg/kg	< 44		< 20		< 360		< 350		< 720		< 240	
P-Nitroaniline	SW8270D	27100	115000	--	--	µg/kg	< 230		< 100		< 1800		< 1800		< 3700		< 1200	
Pyrene	SW8270D	1790000	22600000	54545.45455	--	µg/kg	210		< 4.1		330		600		1200		1100	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	0.484	2.19	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	0.00493	0.0223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	0.164	0.744	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	0.0164	0.0744	--	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDD	E1613B	0.00482	0.0218	0.03	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDF	E1613B	0.0484	0.219	--	--	µg/kg	-		-		-		-		-		-	
OCDD	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
OCDF	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		< 2.8	UJ	< 2.5		< 2.1		57	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	-		-		< 44		< 40		< 34		1.9	J+
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		< 3.6		< 3.3		< 2.8		< 2.3	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	-		-		< 3.2		< 2.9		28	J+	81	
Other																		
Moisture	SM2540	--	--	--	--	%	26		21		120		91		68		38	
Total Organic Carbon	SW9060	--	--	--	--	mg/kg	10500		3940		27200		30500		29200		15500	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM09		ND20-GM09		ND20-GM10		ND20-GM10		ND20-GM10		ND20-GM10	
						Sample ID	ND20-GM09-6080_07/02/2020		ND20-GM09-8010_07/02/2020		ND20-GM10-SURF_06/28/2020		ND20-GM10-0320_07/01/2020		ND20-GM10-0320FD_07/01/2020		ND20-GM10-2040_07/01/2020	
						Parent Sample ID	--		--		--		--		ND20-GM10-0320_07/01/2020		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-01-2020		07-01-2020		07-01-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		FD		N	
Metals																		
Aluminum	SW6010	77500000	100000000	600000	28721000	µg/kg	4940000		5020000		11700000		7930000		8470000		7960000	
Antimony	SW6010	31300	467000	542	--	µg/kg	< 5100		< 6400		< 9900		< 6600		< 6800		< 8100	
Arsenic	SW6010	677	3000	584	8300	µg/kg	2200		2900		4000		4000		4400		3700	
Barium	SW6010	15300000	100000000	164800	364000	µg/kg	40500		37800		97500	*	56700		65400		56000	
Beryllium	SW6010	156000	2300000	6320	--	µg/kg	250	J	230	J	420	J	390	J	400	J	410	J
Cadmium	SW6010	71100	985000	752	1070	µg/kg	190	J	200	J	400	J	550	J	530	J	560	J
Calcium Metal	SW6010	--	--	--	14536000	µg/kg	31000000		33700000		11900000	*	12300000		13100000		14300000	
Chromium	SW6010	--	--	360000000	43500	µg/kg	11900		12000		26100	J	19400		20700		18500	
Cobalt	SW6010	23400	347000	3607.321132	22000	µg/kg	4500		4300	J	8900		6500		7100		6200	J
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	10100	*	8900	*	22900		41500		46600		47300	
Iron	SW6010	54800000	100000000	--	34314000	µg/kg	11300000		10700000		23200000		16300000		17400000		16700000	
Lead	SW6010	400000	800000	27000	51600	µg/kg	3500	J	3300	J	14500		44200	*	36100	*	52800	*
Magnesium	SW6010	--	--	--	8290000	µg/kg	11600000		13200000		8830000	*	7420000		7970000		7800000	
Manganese	SW6010	1830000	25900000	39124.42396	2937000	µg/kg	243000		274000		637000		245000		286000		244000	
Mercury	SW6010	3130	3130	208	--	µg/kg	< 120		< 100		< 180		99	J	100	J	140	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	12400		11200		27100	J	16800		17600		16500	
Potassium	SW6010	--	--	--	--	µg/kg	698000		738000		1440000		964000		1070000		996000	
Selenium	SW6010	391000	5840000	520	--	µg/kg	690	J	< 3700		1000	J	< 3800		< 4000		910	J
Silver	SW6010	391000	5840000	849.0967056	--	µg/kg	< 850		< 1100		< 1600		160	J	110	J	< 1300	
Sodium	SW6010	--	--	--	--	µg/kg	216000	J	239000	J	289000	J	271000	J	271000	J	250000	J
Thallium	SW6010	782	11700	284	--	µg/kg	< 2100		< 2700		< 4100		< 3500		< 3000		< 2700	
Vanadium	SW6010	393000	5840000	60000	85000	µg/kg	26500		26100		36800		31900		33200		31900	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	21300		20500		82500	*	130000		129000		144000	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	4110	28000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1221	SW8081	213	883	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1232	SW8081	190	792	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1242	SW8081	235	972	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1248	SW8081	236	975	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1254	SW8081	239	988	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1260	SW8081	243	1000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	-		-		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM09		ND20-GM09		ND20-GM10		ND20-GM10		ND20-GM10		ND20-GM10	
						Sample ID	ND20-GM09-6080_07/02/2020		ND20-GM09-8010_07/02/2020		ND20-GM10-SURF_06/28/2020		ND20-GM10-0320_07/01/2020		ND20-GM10-0320FD_07/01/2020		ND20-GM10-2040_07/01/2020	
						Parent Sample ID	--		--		--		--		ND20-GM10-0320_07/01/2020		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-01-2020		07-01-2020		07-01-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		0.3 - 2		2 - 4	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	**N**		**N**		**N**		**N**		**FD**		**N**	
Volatile Organic Compounds																		
1,1,1-Trichloroethane	SW8260	640000	640000	140.2	--	µg/kg	-		-		-		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	810	3600	0.156406869	--	µg/kg	-		-		-		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	910000	910000	--	--	µg/kg	-		-		-		-		-		-	
1,1,2-Trichloroethane	SW8260	1590	7010	3.24	--	µg/kg	-		-		-		-		-		-	
1,1-Dichloroethane	SW8260	5060	22200	483.4181818	--	µg/kg	-		-		-		-		-		-	
1,1-Dichloroethene	SW8260	320000	1190000	5.02	--	µg/kg	-		-		-		-		-		-	
1,2,4-Trichlorobenzene	SW8260	24000	113000	408	--	µg/kg	-		-		-		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	7.5	92.3	0.1728	--	µg/kg	-		-		-		-		-		-	
1,2-Dibromoethane	SW8260	50	221	0.0282	--	µg/kg	-		-		-		-		-		-	
1,2-Dichlorobenzene	SW8260	376000	376000	1168	--	µg/kg	-		-		-		-		-		-	
1,2-Dichloroethane	SW8260	652	2870	2.84	--	µg/kg	-		-		-		-		-		-	
1,2-Dichloropropane	SW8260	3400	15000	3.32	--	µg/kg	-		-		-		-		-		-	
1,4-Dichlorobenzene	SW8260	3740	16400	144	--	µg/kg	-		-		-		-		-		-	
2-Butanone	SW8260	28400000	28400000	1666.068223	--	µg/kg	-		-		-		-		-		-	
2-Hexanone	SW8260	237000	1760000	--	--	µg/kg	-		-		-		-		-		-	
4-Methyl-2-pentanone	SW8260	3360000	3360000	225.2396166	--	µg/kg	-		-		-		-		-		-	
Acetone	SW8260	63400000	100000000	3676.595745	--	µg/kg	-		-		-		-		-		-	
Benzene	SW8260	1600	7070	5.12	--	µg/kg	-		-		-		-		-		-	
Bromodichloromethane	SW8260	418	1830	0.3255	--	µg/kg	-		-		-		-		-		-	
Bromoform	SW8260	25400	113000	2.332	--	µg/kg	-		-		-		-		-		-	
Bromomethane	SW8260	9600	43000	5.059602649	--	µg/kg	-		-		-		-		-		-	
Carbon Disulfide	SW8260	738000	738000	591.8618989	--	µg/kg	-		-		-		-		-		-	
Carbon Tetrachloride	SW8260	916	4030	3.88	--	µg/kg	-		-		-		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	126000	530000	3086.294416	--	µg/kg	-		-		-		-		-		-	
Chlorobenzene	SW8260	370000	761000	135.8	--	µg/kg	-		-		-		-		-		-	
Chloroethane	SW8260	2120000	2120000	226.6028708	--	µg/kg	-		-		-		-		-		-	
Chloroform	SW8260	454	1980	3.33	--	µg/kg	-		-		-		-		-		-	
Chloromethane	SW8260	159000	669000	15.5106383	--	µg/kg	-		-		-		-		-		-	
cis-1,2-Dichloroethene	SW8260	156000	2340000	41.2	--	µg/kg	-		-		-		-		-		-	
cis-1,3-Dichloropropene	SW8260	1210000	1210000	--	--	µg/kg	-		-		-		-		-		-	
Cyclohexane	SW8260	117000	117000	--	--	µg/kg	-		-		-		-		-		-	
Dibromochloromethane	SW8260	8280	38900	31.95	--	µg/kg	-		-		-		-		-		-	
Ethylbenzene	SW8260	8020	35400	1570	--	µg/kg	-		-		-		-		-		-	
Isopropylbenzene	SW8260	268000	268000	--	--	µg/kg	-		-		-		-		-		-	
M-Dichlorobenzene	SW8260	297000	297000	1152.77434	--	µg/kg	-		-		-		-		-		-	
Methyl Acetate	SW8260	29000000	29000000	--	--	µg/kg	-		-		-		-		-		-	
Methyl tert-Butyl Ether	SW8260	63800	282000	27.02097902	--	µg/kg	-		-		-		-		-		-	
Methylcyclohexane	SW8260	67600	67600	--	--	µg/kg	-		-		-		-		-		-	
Methylene Chloride	SW8260	61800	1150000	2.56	--	µg/kg	-		-		-		-		-		-	
Styrene	SW8260	867000	867000	220	--	µg/kg	-		-		-		-		-		-	
Tetrachloroethene	SW8260	33000	145000	4.54	--	µg/kg	-		-		-		-		-		-	
Toluene	SW8260	818000	818000	1107.2	--	µg/kg	-		-		-		-		-		-	
trans-1,2-Dichloroethene	SW8260	1560000	1850000	62.6	--	µg/kg	-		-		-		-		-		-	
trans-1,3-Dichloropropene	SW8260	1510000	1510000	--	--	µg/kg	-		-		-		-		-		-	
Trichloroethene	SW8260	1300	8410	3.58	--	µg/kg	-		-		-		-		-		-	
Trichlorofluoromethane	SW8260	1230000	1230000	4477.48062	--	µg/kg	-		-		-		-		-		-	
Vinyl Chloride	SW8260	66.8	2080	0.138	--	µg/kg	-		-		-		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	µg/kg	-		-		-		-		-		-	
o-Xylene	SW8260	434000	434000	--	--	µg/kg	-		-		-		-		-		-	
Xylenes (total)	SW8260	260000	260000	3960	--	µg/kg	-		-		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM09		ND20-GM09		ND20-GM10		ND20-GM10		ND20-GM10		ND20-GM10	
						Sample ID	ND20-GM09-6080_07/02/2020		ND20-GM09-8010_07/02/2020		ND20-GM10-SURF_06/28/2020		ND20-GM10-0320_07/01/2020		ND20-GM10-0320FD_07/01/2020		ND20-GM10-2040_07/01/2020	
						Parent Sample ID	--		--		--		--		ND20-GM10-0320_07/01/2020		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-01-2020		07-01-2020		07-01-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		FD		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	1020000	1020000	--	--	µg/kg	< 4.1		< 4.2		< 67		< 170		< 80		< 50	
2,4,5-Trichlorophenol	SW8270D	6320000	82100000	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
2,4,6-Trichlorophenol	SW8270D	49300	209000	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
2,4-Dichlorophenol	SW8270D	190000	2460000	--	--	µg/kg	< 4.1		< 4.2		< 67		< 170		< 80		< 50	
2,4-Dimethyl Phenol	SW8270D	1260000	16400000	--	--	µg/kg	< 20		< 21		< 330		< 850		23	J	30	J
2,4-Dinitrophenol	SW8270D	126000	1640000	--	--	µg/kg	< 200		< 210		< 3300		< 8500		< 3900		< 2500	
2,4-Dinitrotoluene	SW8270D	1740	7370	0.135443038	--	µg/kg	**< 20**		**< 21**		**< 330**		**< 850**		**< 390**		**< 250**	
2,6-Dinitrotoluene	SW8270D	363	1540	0.137525773	--	µg/kg	**< 20**		**< 21**		**< 330**		**< 850**		**< 390**		**< 250**	
2-Chloronaphthalene	SW8270D	4780000	60300000	--	--	µg/kg	< 4.1		< 4.2		< 67		< 170		< 80		< 50	
2-Chlorophenol	SW8270D	391000	5840000	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
2-Methylnaphthalene	SW8270D	239000	3010000	--	--	µg/kg	0.21	J	< 4.2		24	J	340		350		340	
2-Methylphenol	SW8270D	3160000	41000000	--	--	µg/kg	< 20		< 21		< 330		< 850		12	J	15	J
2-Nitroaniline	SW8270D	627000	8010000	--	--	µg/kg	< 100		< 110		< 1700		< 4400		< 2000		< 1300	
2-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
3,3'-Dichlorobenzidine	SW8270D	1210	5110	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
3-Nitroaniline	SW8270D	--	--	--	--	µg/kg	< 100		< 110		< 1700		< 4400		< 2000		< 1300	
4,6-Dinitro-2-Methylphenol	SW8270D	5060	65700	--	--	µg/kg	< 100		< 110		< 1700		< 4400		< 2000		< 1300	
4-Bromodiphenyl ether	SW8270D	26900	26900	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
4-Chloro-3-methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
4-Methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 20		< 21		7.4	J	78	J	87	J	140	J
4-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 100		< 110		< 1700		< 4400		< 2000		< 1300	
Acenaphthene	SW8270D	3590000	45200000	--	--	µg/kg	1.8	J	< 4.2		40	J	680		910		960	
Acenaphthylene	SW8270D	--	--	--	--	µg/kg	< 4.1		< 4.2		18	J	55	J	50	J	150	
ACETOPHENONE	SW8270D	2520000	2520000	--	--	µg/kg	0.75	J	0.44	J	< 670		< 1700		< 800		< 500	
Anthracene	SW8270D	17900000	100000000	196949.1525	--	µg/kg	< 4.1		< 4.2		110		900		1100		1400	
ATRAZINE	SW8270D	2360	9990	3.9	--	µg/kg	**< 41**		**< 42**		**< 670**		**< 1700**		**< 800**		**< 500**	
BENZALDEHYDE	SW8270D	174000	818000	--	--	µg/kg	1.7	J-	1.4	J-	< 670		40	J	45	J	< 500	
Benzo (a) anthracene	SW8270D	1140	20800	--	--	µg/kg	< 4.1		< 4.2		230		**2100**		**1400**		**2400**	
Benzo (a) pyrene	SW8270D	115	2110	470	--	µg/kg	< 4.1		< 4.2		**200**		**2000**		**990**		**1900**	
Benzo (b) fluoranthene	SW8270D	1150	21100	478.0876494	--	µg/kg	< 4.1		< 4.2		220		**2300**		**1400**		**2200**	
Benzo (ghi) perylene	SW8270D	--	--	--	--	µg/kg	< 4.1		< 4.2		130		1200		540		1200	
Benzo (k) fluoranthene	SW8270D	11500	211000	--	--	µg/kg	< 4.1		< 4.2		91		740		430		880	
Benzo(e)pyrene	SW8270D	--	--	--	--	µg/kg	< 20		< 21		120	J	1600		660		1100	
Biphenyl	SW8270D	68500	288000	--	--	µg/kg	0.48	J	< 21		< 330		76	J	80	J	84	J
bis(2-Chloroethoxy) Methane	SW8270D	190000	2460000	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
Bis-(2-Chloroethyl) Ether	SW8270D	286	1290	--	--	µg/kg	< 4.1		< 4.2		< 67		< 170		< 80		< 50	
bis(2-Ethylhexyl)phthalate	SW8270D	38800	164000	2880	--	µg/kg	< 200		< 210		**< 3300**		**< 8500**		270	J	< 2500	
Butyl Benzyl Phthalate	SW8270D	286000	1210000	--	--	µg/kg	2.1	J	< 21		< 330		< 850		< 390		< 250	
Caprolactam	SW8270D	31300000	100000000	--	--	µg/kg	3.5	J	< 110		< 1700		< 4400	UJ	< 2000	UJ	< 1300	UJ
Carbazole	SW8270D	--	--	--	--	µg/kg	< 4.1		< 4.2		16	J	380		270		540	
Chrysene	SW8270D	115000	2110000	144.2231076	--	µg/kg	< 4.1		< 4.2		**230**		**2200**		**1400**		**2300**	
Dibenz (a,h) anthracene	SW8270D	115	2110	--	--	µg/kg	< 4.1		< 4.2		88		**440**		**160**		**270**	
Dibenzofuran	SW8270D	73000	1040000	--	--	µg/kg	< 20		< 21		36	J	410	J	500		510	
Diethyl Phthalate	SW8270D	50600000	100000000	--	--	µg/kg	0.75	J	0.61	J	< 330		< 850		< 390		< 250	
Dimethyl Phthalate	SW8270D	--	--	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
Di-n-Butylphthalate	SW8270D	6320000	82100000	5033.259424	--	µg/kg	1.8	J	1.7	J	< 330		< 850		< 390		< 250	
Di-n-Octyl phthalate	SW8270D	632000	8210000	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	UJ

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM09		ND20-GM09		ND20-GM10		ND20-GM10		ND20-GM10		ND20-GM10	
						Sample ID	ND20-GM09-6080_07/02/2020		ND20-GM09-8010_07/02/2020		ND20-GM10-SURF_06/28/2020		ND20-GM10-0320_07/01/2020		ND20-GM10-0320FD_07/01/2020		ND20-GM10-2040_07/01/2020	
						Parent Sample ID	--		--		--		--		ND20-GM10-0320_07/01/2020		--	
						Date	07-02-2020		07-02-2020		06-28-2020		07-01-2020		07-01-2020		07-01-2020	
						Sample Depth (ft bss)	6 - 8		8 - 10		0 - 0.3		0.3 - 2		0.3 - 2		2 - 4	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	**N**		**N**		**N**		**N**		**FD**		**N**	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene	SW8270D	2390000	30100000	88877.80549	--	µg/kg	0.85	J	< 4.2		500		4600		3800		5400	
Fluorene	SW8270D	2390000	30100000	14829.93197	--	µg/kg	0.88	J	0.25	J	66	J	810		1300		990	
Hexachlorobenzene	SW8270D	252	1150	25.2	--	µg/kg	< 4.1		< 4.2		< 67		< 170		< 80		< 50	
Hexachlorobutadiene	SW8270D	1630	7190	--	--	µg/kg	< 4.1		< 4.2		< 67		< 170		< 80		< 50	
Hexachlorocyclopentadiene	SW8270D	2550	10800	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
Hexachloroethane	SW8270D	2520	11100	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
Indeno (1,2,3-cd) pyrene	SW8270D	1150	21100	--	--	µg/kg	< 4.1		< 4.2		120		870		470		1000	
Isophorone	SW8270D	571000	2420000	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
Naphthalene	SW8270D	5520	24100	658.1818182	--	µg/kg	< 4.1		0.4	J	44	J	620		**670**		530	
Nitrobenzene	SW8270D	7420	32400	--	--	µg/kg	< 41		< 42		< 660		< 1700		< 800		< 500	
N-Nitroso-Di-N-Propylamine	SW8270D	77.5	328	--	--	µg/kg	< 4.1		< 4.2		< 67		< 170		< 80		< 50	UJ
N-Nitrosodiphenylamine	SW8270D	111000	469000	76.42622951	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
P-Chloroaniline	SW8270D	2710	11500	--	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
Pentachlorophenol	SW8270D	1020	3970	2.76	--	µg/kg	< 100	UJ	< 110	UJ	< 1700		< 4400		< 2000		< 1300	UJ
Phenanthrene	SW8270D	--	--	--	--	µg/kg	1.3	J	0.93	J	260		4200		5100		5800	
Phenol	SW8270D	19000000	100000000	2294.627383	--	µg/kg	< 20		< 21		< 330		< 850		< 390		< 250	
P-Nitroaniline	SW8270D	27100	115000	--	--	µg/kg	< 100		< 110		< 1700		< 4400		< 2000		< 1300	
Pyrene	SW8270D	1790000	22600000	54545.45455	--	µg/kg	0.77	J	< 4.2		410		4500		3500		5800	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	0.484	2.19	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	0.00493	0.0223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	0.164	0.744	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	0.0164	0.0744	--	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDD	E1613B	0.00482	0.0218	0.03	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDF	E1613B	0.0484	0.219	--	--	µg/kg	-		-		-		-		-		-	
OCDD	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
OCDF	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	µg/kg	< 1.6		< 1.6		-		-		-		-	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	< 25		< 26		-		-		-		-	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	< 2.1		< 2.1		-		-		-		-	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	< 1.8		0.58	J	-		-		-		-	
Other																		
Moisture	SM2540	--	--	--	--	%	23		22		100		59		56		49	
Total Organic Carbon	SW9060	--	--	--	--	mg/kg	1760		9690		27200		39400		42000		27800	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM10		ND20-GM10		ND20-GM11		ND20-GM11		ND20-GM11		ND20-GM11	
						Sample ID	ND20-GM10-4060_07/01/2020		ND20-GM10-4060FD_07/01/2020		ND20-GM11-SURF_06/28/2020		ND20-GM11-SURFFD_06/28/2020		ND20-GM11-0320_07/01/2020		ND20-GM11-2040_07/01/2020	
						Parent Sample ID	--		ND20-GM10-4060_07/01/2020		--		ND20-GM11-SURF_06/28/2020		--		--	
						Date	07-01-2020		07-01-2020		06-28-2020		06-28-2020		07-01-2020		07-01-2020	
						Sample Depth (ft bss)	4 - 6		4 - 6		0 - 0.3		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		FD		N		FD		N		N	
Metals																		
Aluminum	SW6010	77500000	100000000	600000	28721000	µg/kg	**5680000**		**7820000**		**10000000**		**9740000**		**8020000**		**8690000**	
Antimony	SW6010	31300	467000	542	--	µg/kg	< 6200		< 6700		**650**	**J**	< 9100		< 6400		< 7600	
Arsenic	SW6010	677	3000	584	8300	µg/kg	**3500**		**3400**		**3500**		**4200**		**3600**		**4000**	
Barium	SW6010	15300000	100000000	164800	364000	µg/kg	41100		57800		78200	*	79100	*	63900		83100	
Beryllium	SW6010	156000	2300000	6320	--	µg/kg	320	J	390	J	370	J	390	J	390	J	390	J
Cadmium	SW6010	71100	985000	752	1070	µg/kg	400	J	530	J	320	J	340	J	300	J	410	J
Calcium Metal	SW6010	--	--	--	14536000	µg/kg	**17400000**		**17300000**		10600000	*	11400000	*	**15700000**		13800000	
Chromium	SW6010	--	--	360000000	43500	µg/kg	15800		19600		21900	J	22100	J	18300		20500	
Cobalt	SW6010	23400	347000	3607.321132	22000	µg/kg	**5000**	**J**	**6200**		**7800**		**7800**		**6500**		**6900**	
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	21800		27800		17400		17700		15000		21500	
Iron	SW6010	54800000	100000000	--	34314000	µg/kg	13100000		16400000		20800000		20700000		17100000		18300000	
Lead	SW6010	400000	800000	27000	51600	µg/kg	**47300**	*****	**38300**	*****	11200		11400		11700	*	16500	*
Magnesium	SW6010	--	--	--	8290000	µg/kg	7780000		**8740000**		7150000	*	7340000	*	7530000		7910000	
Manganese	SW6010	1830000	25900000	39124.42396	2937000	µg/kg	**216000**		**267000**		**687000**		**713000**		**423000**		**422000**	
Mercury	SW6010	3130	3130	208	--	µg/kg	95	J	190		< 180		< 160		< 150		70	J
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	**13900**		**16500**		**18700**	**J**	**19200**	**J**	**16000**		**17200**	
Potassium	SW6010	--	--	--	--	µg/kg	717000		1020000		1250000		1200000		1030000		1110000	
Selenium	SW6010	391000	5840000	520	--	µg/kg	< 3600		< 3900		**720**	**J**	< 5300		< 3700		**830**	**J**
Silver	SW6010	391000	5840000	849.0967056	--	µg/kg	< 1000		100	J	< 1300		< 1500		< 1100		< 1300	
Sodium	SW6010	--	--	--	--	µg/kg	230000	J	258000	J	251000	J	246000	J	255000	J	266000	J
Thallium	SW6010	782	11700	284	--	µg/kg	< 3000		< 2700		< 3300		< 3800		< 2800		< 3400	
Vanadium	SW6010	393000	5840000	60000	85000	µg/kg	27300		31500		33300		32600		31300		32300	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	94700		131000		66000	*	68800	*	56900		91200	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	4110	28000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1221	SW8081	213	883	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1232	SW8081	190	792	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1242	SW8081	235	972	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1248	SW8081	236	975	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1254	SW8081	239	988	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1260	SW8081	243	1000	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	µg/kg	-		-		-		-		-		-	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	-		-		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM10	ND20-GM10	ND20-GM11	ND20-GM11	ND20-GM11	ND20-GM11
						Sample ID	ND20-GM10-4060_07/01/2020	ND20-GM10-4060FD_07/01/2020	ND20-GM11-SURF_06/28/2020	ND20-GM11-SURFFD_06/28/2020	ND20-GM11-0320_07/01/2020	ND20-GM11-2040_07/01/2020
						Parent Sample ID	--	ND20-GM10-4060_07/01/2020	--	ND20-GM11-SURF_06/28/2020	--	--
						Date	07-01-2020	07-01-2020	06-28-2020	06-28-2020	07-01-2020	07-01-2020
						Sample Depth (ft bss)	4 - 6	4 - 6	0 - 0.3	0 - 0.3	0.3 - 2	2 - 4
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	**N**	**FD**	**N**	**FD**	**N**	**N**
Volatile Organic Compounds												
1,1,1-Trichloroethane	SW8260	640000	640000	140.2	--	µg/kg	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	SW8260	810	3600	0.156406869	--	µg/kg	-	-	-	-	-	-
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	910000	910000	--	--	µg/kg	-	-	-	-	-	-
1,1,2-Trichloroethane	SW8260	1590	7010	3.24	--	µg/kg	-	-	-	-	-	-
1,1-Dichloroethane	SW8260	5060	22200	483.4181818	--	µg/kg	-	-	-	-	-	-
1,1-Dichloroethene	SW8260	320000	1190000	5.02	--	µg/kg	-	-	-	-	-	-
1,2,4-Trichlorobenzene	SW8260	24000	113000	408	--	µg/kg	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	7.5	92.3	0.1728	--	µg/kg	-	-	-	-	-	-
1,2-Dibromoethane	SW8260	50	221	0.0282	--	µg/kg	-	-	-	-	-	-
1,2-Dichlorobenzene	SW8260	376000	376000	1168	--	µg/kg	-	-	-	-	-	-
1,2-Dichloroethane	SW8260	652	2870	2.84	--	µg/kg	-	-	-	-	-	-
1,2-Dichloropropane	SW8260	3400	15000	3.32	--	µg/kg	-	-	-	-	-	-
1,4-Dichlorobenzene	SW8260	3740	16400	144	--	µg/kg	-	-	-	-	-	-
2-Butanone	SW8260	28400000	28400000	1666.068223	--	µg/kg	-	-	-	-	-	-
2-Hexanone	SW8260	237000	1760000	--	--	µg/kg	-	-	-	-	-	-
4-Methyl-2-pentanone	SW8260	3360000	3360000	225.2396166	--	µg/kg	-	-	-	-	-	-
Acetone	SW8260	63400000	100000000	3676.595745	--	µg/kg	-	-	-	-	-	-
Benzene	SW8260	1600	7070	5.12	--	µg/kg	-	-	-	-	-	-
Bromodichloromethane	SW8260	418	1830	0.3255	--	µg/kg	-	-	-	-	-	-
Bromoform	SW8260	25400	113000	2.332	--	µg/kg	-	-	-	-	-	-
Bromomethane	SW8260	9600	43000	5.059602649	--	µg/kg	-	-	-	-	-	-
Carbon Disulfide	SW8260	738000	738000	591.8618989	--	µg/kg	-	-	-	-	-	-
Carbon Tetrachloride	SW8260	916	4030	3.88	--	µg/kg	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	SW8260	126000	530000	3086.294416	--	µg/kg	-	-	-	-	-	-
Chlorobenzene	SW8260	370000	761000	135.8	--	µg/kg	-	-	-	-	-	-
Chloroethane	SW8260	2120000	2120000	226.6028708	--	µg/kg	-	-	-	-	-	-
Chloroform	SW8260	454	1980	3.33	--	µg/kg	-	-	-	-	-	-
Chloromethane	SW8260	159000	669000	15.5106383	--	µg/kg	-	-	-	-	-	-
cis-1,2-Dichloroethene	SW8260	156000	2340000	41.2	--	µg/kg	-	-	-	-	-	-
cis-1,3-Dichloropropene	SW8260	1210000	1210000	--	--	µg/kg	-	-	-	-	-	-
Cyclohexane	SW8260	117000	117000	--	--	µg/kg	-	-	-	-	-	-
Dibromochloromethane	SW8260	8280	38900	31.95	--	µg/kg	-	-	-	-	-	-
Ethylbenzene	SW8260	8020	35400	1570	--	µg/kg	-	-	-	-	-	-
Isopropylbenzene	SW8260	268000	268000	--	--	µg/kg	-	-	-	-	-	-
M-Dichlorobenzene	SW8260	297000	297000	1152.77434	--	µg/kg	-	-	-	-	-	-
Methyl Acetate	SW8260	29000000	29000000	--	--	µg/kg	-	-	-	-	-	-
Methyl tert-Butyl Ether	SW8260	63800	282000	27.02097902	--	µg/kg	-	-	-	-	-	-
Methylcyclohexane	SW8260	67600	67600	--	--	µg/kg	-	-	-	-	-	-
Methylene Chloride	SW8260	61800	1150000	2.56	--	µg/kg	-	-	-	-	-	-
Styrene	SW8260	867000	867000	220	--	µg/kg	-	-	-	-	-	-
Tetrachloroethene	SW8260	33000	145000	4.54	--	µg/kg	-	-	-	-	-	-
Toluene	SW8260	818000	818000	1107.2	--	µg/kg	-	-	-	-	-	-
trans-1,2-Dichloroethene	SW8260	1560000	1850000	62.6	--	µg/kg	-	-	-	-	-	-
trans-1,3-Dichloropropene	SW8260	1510000	1510000	--	--	µg/kg	-	-	-	-	-	-
Trichloroethene	SW8260	1300	8410	3.58	--	µg/kg	-	-	-	-	-	-
Trichlorofluoromethane	SW8260	1230000	1230000	4477.48062	--	µg/kg	-	-	-	-	-	-
Vinyl Chloride	SW8260	66.8	2080	0.138	--	µg/kg	-	-	-	-	-	-
m,p-Xylene	SW8260	--	--	--	--	µg/kg	-	-	-	-	-	-
o-Xylene	SW8260	434000	434000	--	--	µg/kg	-	-	-	-	-	-
Xylenes (total)	SW8260	260000	260000	3960	--	µg/kg	-	-	-	-	-	-

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM10		ND20-GM10		ND20-GM11		ND20-GM11		ND20-GM11		ND20-GM11	
						Sample ID	ND20-GM10-4060_07/01/2020		ND20-GM10-4060FD_07/01/2020		ND20-GM11-SURF_06/28/2020		ND20-GM11-SURFFD_06/28/2020		ND20-GM11-0320_07/01/2020		ND20-GM11-2040_07/01/2020	
						Parent Sample ID	--		ND20-GM10-4060_07/01/2020		--		ND20-GM11-SURF_06/28/2020		--		--	
						Date	07-01-2020		07-01-2020		06-28-2020		06-28-2020		07-01-2020		07-01-2020	
						Sample Depth (ft bss)	4 - 6		4 - 6		0 - 0.3		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		FD		N		FD		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	1020000	1020000	--	--	µg/kg	< 47		< 55		< 64		< 63		< 50		< 56	
2,4,5-Trichlorophenol	SW8270D	6320000	82100000	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
2,4,6-Trichlorophenol	SW8270D	49300	209000	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
2,4-Dichlorophenol	SW8270D	190000	2460000	--	--	µg/kg	< 47		< 55		< 64		< 63		< 50		< 56	
2,4-Dimethyl Phenol	SW8270D	1260000	16400000	--	--	µg/kg	16	J	< 270		< 320		< 310		< 250		< 280	
2,4-Dinitrophenol	SW8270D	126000	1640000	--	--	µg/kg	< 2300		< 2700		< 3200		< 3100		< 2500		< 2800	
2,4-Dinitrotoluene	SW8270D	1740	7370	0.135443038	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
2,6-Dinitrotoluene	SW8270D	363	1540	0.137525773	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
2-Chloronaphthalene	SW8270D	4780000	60300000	--	--	µg/kg	< 47		< 55		< 64		< 63		< 50		< 56	
2-Chlorophenol	SW8270D	391000	5840000	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
2-Methylnaphthalene	SW8270D	239000	3010000	--	--	µg/kg	220		300		24	J	48	J	59		110	
2-Methylphenol	SW8270D	3160000	41000000	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
2-Nitroaniline	SW8270D	627000	8010000	--	--	µg/kg	< 1200		< 1400		< 1600		< 1600		< 1300		< 1400	
2-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
3,3'-Dichlorobenzidine	SW8270D	1210	5110	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
3-Nitroaniline	SW8270D	--	--	--	--	µg/kg	< 1200		< 1400		< 1600		< 1600		< 1300		< 1400	
4,6-Dinitro-2-Methylphenol	SW8270D	5060	65700	--	--	µg/kg	< 1200		< 1400		< 1600		< 1600		< 1300		< 1400	
4-Bromodiphenyl ether	SW8270D	26900	26900	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
4-Chloro-3-methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
4-Methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	62	J	74	J	< 320		12	J	11	J	33	J
4-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 1200		< 1400		< 1600		< 1600		< 1300		< 1400	
Acenaphthene	SW8270D	3590000	45200000	--	--	µg/kg	300		410		43	J	93		180		380	
Acenaphthylene	SW8270D	--	--	--	--	µg/kg	30	J	32	J	15	J	21	J	14	J	37	J
ACETOPHENONE	SW8270D	2520000	2520000	--	--	µg/kg	< 470		< 550		< 640		< 630		< 500		< 560	
Anthracene	SW8270D	17900000	100000000	196949.1525	--	µg/kg	450		560		56	J	110		220		900	
ATRAZINE	SW8270D	2360	9990	3.9	--	µg/kg	< 470		< 550		< 640		< 630		< 500		< 560	
BENZALDEHYDE	SW8270D	174000	818000	--	--	µg/kg	< 470		< 550		20	J	20	J	22	J	33	J
Benzo (a) anthracene	SW8270D	1140	20800	--	--	µg/kg	690		730		110		260		310		820	
Benzo (a) pyrene	SW8270D	115	2110	470	--	µg/kg	**510**		**490**		91		**220**		**210**		**440**	
Benzo (b) fluoranthene	SW8270D	1150	21100	478.0876494	--	µg/kg	**590**		**630**		110		280		280		**700**	
Benzo (ghi) perylene	SW8270D	--	--	--	--	µg/kg	310		310		65		150		150		270	
Benzo (k) fluoranthene	SW8270D	11500	211000	--	--	µg/kg	270		240		50	J	110		110		210	
Benzo(e)pyrene	SW8270D	--	--	--	--	µg/kg	330		330		61	J	140	J	140	J	310	
Biphenyl	SW8270D	68500	288000	--	--	µg/kg	35	J	50	J	7	J	14	J	15	J	28	J
bis(2-Chloroethoxy) Methane	SW8270D	190000	2460000	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
Bis-(2-Chloroethyl) Ether	SW8270D	286	1290	--	--	µg/kg	< 47		< 55		< 64		< 63		< 50		< 56	
bis(2-Ethylhexyl)phthalate	SW8270D	38800	164000	2880	--	µg/kg	< 2300		< 2700		28	J	< 3100		25	J	64	J
Butyl Benzyl Phthalate	SW8270D	286000	1210000	--	--	µg/kg	< 230		3.2	J	< 320		< 310		< 250		< 280	
Caprolactam	SW8270D	31300000	100000000	--	--	µg/kg	< 1200	UJ	< 1400	UJ	< 1600		< 1600		< 1300	UJ	< 1400	UJ
Carbazole	SW8270D	--	--	--	--	µg/kg	98		130		17	J	54	J	52		76	
Chrysene	SW8270D	115000	2110000	144.2231076	--	µg/kg	**700**		**760**		110		**260**		**330**		**970**	
Dibenz (a,h) anthracene	SW8270D	115	2110	--	--	µg/kg	83		91		69		93		33	J	74	
Dibenzofuran	SW8270D	73000	1040000	--	--	µg/kg	190	J	270	J	29	J	69	J	94	J	270	J
Diethyl Phthalate	SW8270D	50600000	100000000	--	--	µg/kg	< 230		< 270		9.6	J	< 310		< 250		< 280	
Dimethyl Phthalate	SW8270D	--	--	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
Di-n-Butylphthalate	SW8270D	6320000	82100000	5033.259424	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
Di-n-Octyl phthalate	SW8270D	632000	8210000	--	--	µg/kg	< 230	UJ	< 270	UJ	< 320		< 310		< 250	UJ	< 280	UJ

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM10		ND20-GM10		ND20-GM11		ND20-GM11		ND20-GM11		ND20-GM11	
						Sample ID	ND20-GM10-4060_07/01/2020		ND20-GM10-4060FD_07/01/2020		ND20-GM11-SURF_06/28/2020		ND20-GM11-SURFFD_06/28/2020		ND20-GM11-0320_07/01/2020		ND20-GM11-2040_07/01/2020	
						Parent Sample ID	--		ND20-GM10-4060_07/01/2020		--		ND20-GM11-SURF_06/28/2020		--		--	
						Date	07-01-2020		07-01-2020		06-28-2020		06-28-2020		07-01-2020		07-01-2020	
						Sample Depth (ft bss)	4 - 6		4 - 6		0 - 0.3		0 - 0.3		0.3 - 2		2 - 4	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		FD		N		FD		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene	SW8270D	2390000	30100000	88877.80549	--	µg/kg	1700		2100		260		650		810		2100	
Fluorene	SW8270D	2390000	30100000	14829.93197	--	µg/kg	370		500		54	J	110		210		570	
Hexachlorobenzene	SW8270D	252	1150	25.2	--	µg/kg	< 47		< 55		< 64		< 63		< 50		< 56	
Hexachlorobutadiene	SW8270D	1630	7190	--	--	µg/kg	< 47		< 55		< 64		< 63		< 50		< 56	
Hexachlorocyclopentadiene	SW8270D	2550	10800	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
Hexachloroethane	SW8270D	2520	11100	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
Indeno (1,2,3-cd) pyrene	SW8270D	1150	21100	--	--	µg/kg	250		260		61	J	150		120		230	
Isophorone	SW8270D	571000	2420000	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
Naphthalene	SW8270D	5520	24100	658.1818182	--	µg/kg	290		410		48	J	110		95		180	
Nitrobenzene	SW8270D	7420	32400	--	--	µg/kg	< 470		< 550		< 640		< 630		< 500		< 560	
N-Nitroso-Di-N-Propylamine	SW8270D	77.5	328	--	--	µg/kg	< 47	UJ	< 55	UJ	< 64		< 63		< 50	UJ	< 56	UJ
N-Nitrosodiphenylamine	SW8270D	111000	469000	76.42622951	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
P-Chloroaniline	SW8270D	2710	11500	--	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
Pentachlorophenol	SW8270D	1020	3970	2.76	--	µg/kg	< 1200	UJ	< 1400	UJ	< 1600		< 1600		< 1300	UJ	< 1400	UJ
Phenanthrene	SW8270D	--	--	--	--	µg/kg	1800		2500		170		520		810		2100	
Phenol	SW8270D	19000000	100000000	2294.627383	--	µg/kg	< 230		< 270		< 320		< 310		< 250		< 280	
P-Nitroaniline	SW8270D	27100	115000	--	--	µg/kg	< 1200		< 1400		< 1600		< 1600		< 1300		< 1400	
Pyrene	SW8270D	1790000	22600000	54545.45455	--	µg/kg	1800		2100		220		510		840		2000	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	0.484	2.19	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	0.00493	0.0223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	0.164	0.744	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	0.0164	0.0744	--	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDD	E1613B	0.00482	0.0218	0.03	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDF	E1613B	0.0484	0.219	--	--	µg/kg	-		-		-		-		-		-	
OCDD	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
OCDF	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		< 2.5	UJ	< 2.4	UJ	< 2		< 1.9	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	-		-		< 40		< 39		< 31		< 31	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	-		-		< 3.3		< 3.2		< 2.6		< 2.5	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	-		-		19	J	< 2.8	UJ	< 2.3		< 2.2	
Other																		
Moisture	SM2540	--	--	--	--	%	44		52		92		87		51		51	
Total Organic Carbon	SW9060	--	--	--	--	mg/kg	14500		19800		17400		20700		16800		25600	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM11		ND20-GM12		ND20-GM12		ND20-GM12		ND20-GM12		ND20-GM13	
						Sample ID	ND20-GM11-4060_07/01/2020		ND20-GM12-SURF_06/28/2020		ND20-GM12-0320_07/02/2020		ND20-GM12-2040_07/02/2020		ND20-GM12-4060_07/02/2020		ND20-GM13-SURF_07/01/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-01-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020		07-01-2020	
						Sample Depth (ft bss)	4 - 6		0 - 0.3		0.3 - 2		2 - 4		4 - 6		0 - 0.3	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	N		N		N		N		N		N	
Metals																		
Aluminum	SW6010	77500000	100000000	600000	28721000	µg/kg	**8110000**		**8490000**		**7220000**		**5680000**		**5380000**		**6860000**	
Antimony	SW6010	31300	467000	542	--	µg/kg	< 5500		< 7300		< 8400		< 9700		< 6500		< 6900	
Arsenic	SW6010	677	3000	584	8300	µg/kg	**4000**		**3100**		**3900**		**2500**		**3000**		**3000**	
Barium	SW6010	15300000	100000000	164800	364000	µg/kg	57200		69200	*	63400		45600		42700		59100	
Beryllium	SW6010	156000	2300000	6320	--	µg/kg	370	J	310	J	360	J	300	J	300	J	340	J
Cadmium	SW6010	71100	985000	752	1070	µg/kg	370	J	300	J	320	J	250	J	320	J	260	J
Calcium Metal	SW6010	--	--	--	14536000	µg/kg	**22100000**		10100000	*	10300000		13100000		**19900000**		9200000	
Chromium	SW6010	--	--	360000000	43500	µg/kg	18500		19000	J	17600		14200		13200		16700	
Cobalt	SW6010	23400	347000	3607.321132	22000	µg/kg	**6400**		**6800**		**6300**	**J**	**4600**	**J**	**5500**		**5900**	
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	18800		16900		16000		15100		**40700**		16400	
Iron	SW6010	54800000	100000000	--	34314000	µg/kg	16600000		17800000		15600000		10600000		12300000		14600000	
Lead	SW6010	400000	800000	27000	51600	µg/kg	14700	*	12600		16600		10800		24000		10200	
Magnesium	SW6010	--	--	--	8290000	µg/kg	**10500000**		6030000	*	6660000		5980000		**8710000**		5670000	
Manganese	SW6010	1830000	25900000	39124.42396	2937000	µg/kg	**425000**		**535000**		**349000**		**208000**		**251000**		**425000**	
Mercury	SW6010	3130	3130	208	--	µg/kg	51	J	< 150		58	J	< 190		72	J	52	J
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	**16600**		**16300**	**J**	**15400**		12500		**13500**		**14300**	
Potassium	SW6010	--	--	--	--	µg/kg	1090000		1040000		887000		639000	J	708000		845000	
Selenium	SW6010	391000	5840000	520	--	µg/kg	**650**	**J**	< 4300		< 4900		< 5700		< 3800		< 4100	
Silver	SW6010	391000	5840000	849.0967056	--	µg/kg	< 920		< 1200		< 1400		< 1600		230	J	< 1200	
Sodium	SW6010	--	--	--	--	µg/kg	286000	J	227000	J	221000	J	179000	J	208000	J	205000	J
Thallium	SW6010	782	11700	284	--	µg/kg	< 2800		< 3100		< 3500		< 4000		< 2700		< 2900	
Vanadium	SW6010	393000	5840000	60000	85000	µg/kg	31900		27800		29200		24100		24200		26600	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	66900		70500	*	69900		30100		66800		50900	
Polychlorinated Biphenyls																		
Aroclor 1016	SW8081	4110	28000	--	--	µg/kg	-		< 62		< 51		< 64		< 46		-	
Aroclor 1221	SW8081	213	883	--	--	µg/kg	-		< 62		< 51		< 64		< 46		-	
Aroclor 1232	SW8081	190	792	--	--	µg/kg	-		< 62		< 51		< 64		< 46		-	
Aroclor 1242	SW8081	235	972	--	--	µg/kg	-		< 62		< 51		< 64		< 46		-	
Aroclor 1248	SW8081	236	975	--	--	µg/kg	-		< 62		< 51		< 64		< 46		-	
Aroclor 1254	SW8081	239	988	--	--	µg/kg	-		< 62		26	J	< 64		36	J	-	
Aroclor 1260	SW8081	243	1000	--	--	µg/kg	-		7	J	< 51		3.7	J	< 46		-	
Aroclor 1262	SW8081	--	--	--	--	µg/kg	-		< 62		< 51		< 64		< 46		-	
Aroclor 1268	SW8081	--	--	--	--	µg/kg	-		< 62		< 51		< 64		< 46		-	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	-		7		**26**		3.7		**36**		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM11	ND20-GM12	ND20-GM12	ND20-GM12	ND20-GM12	ND20-GM13
						Sample ID	ND20-GM11-4060_07/01/2020	ND20-GM12-SURF_06/28/2020	ND20-GM12-0320_07/02/2020	ND20-GM12-2040_07/02/2020	ND20-GM12-4060_07/02/2020	ND20-GM13-SURF_07/01/2020
						Parent Sample ID	--	--	--	--	--	--
						Date	07-01-2020	06-28-2020	07-02-2020	07-02-2020	07-02-2020	07-01-2020
						Sample Depth (ft bss)	4 - 6	0 - 0.3	0.3 - 2	2 - 4	4 - 6	0 - 0.3
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	N	N	N	N	N	N
Volatile Organic Compounds												
1,1,1-Trichloroethane	SW8260	640000	640000	140.2	--	µg/kg	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	SW8260	810	3600	0.156406869	--	µg/kg	-	-	-	-	-	-
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	910000	910000	--	--	µg/kg	-	-	-	-	-	-
1,1,2-Trichloroethane	SW8260	1590	7010	3.24	--	µg/kg	-	-	-	-	-	-
1,1-Dichloroethane	SW8260	5060	22200	483.4181818	--	µg/kg	-	-	-	-	-	-
1,1-Dichloroethene	SW8260	320000	1190000	5.02	--	µg/kg	-	-	-	-	-	-
1,2,4-Trichlorobenzene	SW8260	24000	113000	408	--	µg/kg	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	7.5	92.3	0.1728	--	µg/kg	-	-	-	-	-	-
1,2-Dibromoethane	SW8260	50	221	0.0282	--	µg/kg	-	-	-	-	-	-
1,2-Dichlorobenzene	SW8260	376000	376000	1168	--	µg/kg	-	-	-	-	-	-
1,2-Dichloroethane	SW8260	652	2870	2.84	--	µg/kg	-	-	-	-	-	-
1,2-Dichloropropane	SW8260	3400	15000	3.32	--	µg/kg	-	-	-	-	-	-
1,4-Dichlorobenzene	SW8260	3740	16400	144	--	µg/kg	-	-	-	-	-	-
2-Butanone	SW8260	28400000	28400000	1666.068223	--	µg/kg	-	-	-	-	-	-
2-Hexanone	SW8260	237000	1760000	--	--	µg/kg	-	-	-	-	-	-
4-Methyl-2-pentanone	SW8260	3360000	3360000	225.2396166	--	µg/kg	-	-	-	-	-	-
Acetone	SW8260	63400000	100000000	3676.595745	--	µg/kg	-	-	-	-	-	-
Benzene	SW8260	1600	7070	5.12	--	µg/kg	-	-	-	-	-	-
Bromodichloromethane	SW8260	418	1830	0.3255	--	µg/kg	-	-	-	-	-	-
Bromoform	SW8260	25400	113000	2.332	--	µg/kg	-	-	-	-	-	-
Bromomethane	SW8260	9600	43000	5.059602649	--	µg/kg	-	-	-	-	-	-
Carbon Disulfide	SW8260	738000	738000	591.8618989	--	µg/kg	-	-	-	-	-	-
Carbon Tetrachloride	SW8260	916	4030	3.88	--	µg/kg	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	SW8260	126000	530000	3086.294416	--	µg/kg	-	-	-	-	-	-
Chlorobenzene	SW8260	370000	761000	135.8	--	µg/kg	-	-	-	-	-	-
Chloroethane	SW8260	2120000	2120000	226.6028708	--	µg/kg	-	-	-	-	-	-
Chloroform	SW8260	454	1980	3.33	--	µg/kg	-	-	-	-	-	-
Chloromethane	SW8260	159000	669000	15.5106383	--	µg/kg	-	-	-	-	-	-
cis-1,2-Dichloroethene	SW8260	156000	2340000	41.2	--	µg/kg	-	-	-	-	-	-
cis-1,3-Dichloropropene	SW8260	1210000	1210000	--	--	µg/kg	-	-	-	-	-	-
Cyclohexane	SW8260	117000	117000	--	--	µg/kg	-	-	-	-	-	-
Dibromochloromethane	SW8260	8280	38900	31.95	--	µg/kg	-	-	-	-	-	-
Ethylbenzene	SW8260	8020	35400	1570	--	µg/kg	-	-	-	-	-	-
Isopropylbenzene	SW8260	268000	268000	--	--	µg/kg	-	-	-	-	-	-
M-Dichlorobenzene	SW8260	297000	297000	1152.77434	--	µg/kg	-	-	-	-	-	-
Methyl Acetate	SW8260	29000000	29000000	--	--	µg/kg	-	-	-	-	-	-
Methyl tert-Butyl Ether	SW8260	63800	282000	27.02097902	--	µg/kg	-	-	-	-	-	-
Methylcyclohexane	SW8260	67600	67600	--	--	µg/kg	-	-	-	-	-	-
Methylene Chloride	SW8260	61800	1150000	2.56	--	µg/kg	-	-	-	-	-	-
Styrene	SW8260	867000	867000	220	--	µg/kg	-	-	-	-	-	-
Tetrachloroethene	SW8260	33000	145000	4.54	--	µg/kg	-	-	-	-	-	-
Toluene	SW8260	818000	818000	1107.2	--	µg/kg	-	-	-	-	-	-
trans-1,2-Dichloroethene	SW8260	1560000	1850000	62.6	--	µg/kg	-	-	-	-	-	-
trans-1,3-Dichloropropene	SW8260	1510000	1510000	--	--	µg/kg	-	-	-	-	-	-
Trichloroethene	SW8260	1300	8410	3.58	--	µg/kg	-	-	-	-	-	-
Trichlorofluoromethane	SW8260	1230000	1230000	4477.48062	--	µg/kg	-	-	-	-	-	-
Vinyl Chloride	SW8260	66.8	2080	0.138	--	µg/kg	-	-	-	-	-	-
m,p-Xylene	SW8260	--	--	--	--	µg/kg	-	-	-	-	-	-
o-Xylene	SW8260	434000	434000	--	--	µg/kg	-	-	-	-	-	-
Xylenes (total)	SW8260	260000	260000	3960	--	µg/kg	-	-	-	-	-	-

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM11		ND20-GM12		ND20-GM12		ND20-GM12		ND20-GM12		ND20-GM13	
						Sample ID	ND20-GM11-4060_07/01/2020		ND20-GM12-SURF_06/28/2020		ND20-GM12-0320_07/02/2020		ND20-GM12-2040_07/02/2020		ND20-GM12-4060_07/02/2020		ND20-GM13-SURF_07/01/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-01-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020		07-01-2020	
						Sample Depth (ft bss)	4 - 6		0 - 0.3		0.3 - 2		2 - 4		4 - 6		0 - 0.3	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds																		
2,2'-Oxybis(1-Chloropropane)	SW8270D	1020000	1020000	--	--	µg/kg	< 70		< 31		< 79		< 96		< 68		< 28	
2,4,5-Trichlorophenol	SW8270D	6320000	82100000	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
2,4,6-Trichlorophenol	SW8270D	49300	209000	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
2,4-Dichlorophenol	SW8270D	190000	2460000	--	--	µg/kg	< 70		< 31		< 79		< 96		< 68		< 28	
2,4-Dimethyl Phenol	SW8270D	1260000	16400000	--	--	µg/kg	9.2	J	< 150		< 390		< 470		< 330		< 140	
2,4-Dinitrophenol	SW8270D	126000	1640000	--	--	µg/kg	< 3500		< 1500		39	J	< 4700		< 3300		< 1400	
2,4-Dinitrotoluene	SW8270D	1740	7370	0.135443038	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
2,6-Dinitrotoluene	SW8270D	363	1540	0.137525773	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
2-Chloronaphthalene	SW8270D	4780000	60300000	--	--	µg/kg	< 70		< 31		< 79		< 96		< 68		< 28	
2-Chlorophenol	SW8270D	391000	5840000	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
2-Methylnaphthalene	SW8270D	239000	3010000	--	--	µg/kg	120		30	J	130		7.4	J	130		28	
2-Methylphenol	SW8270D	3160000	41000000	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
2-Nitroaniline	SW8270D	627000	8010000	--	--	µg/kg	< 1800		< 780		< 2000		< 2400		< 1700		< 710	
2-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
3,3'-Dichlorobenzidine	SW8270D	1210	5110	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
3-Nitroaniline	SW8270D	--	--	--	--	µg/kg	< 1800		< 780		< 2000		< 2400		< 1700		< 710	
4,6-Dinitro-2-Methylphenol	SW8270D	5060	65700	--	--	µg/kg	< 1800		< 780		< 2000		< 2400		< 1700		< 710	
4-Bromodiphenyl ether	SW8270D	26900	26900	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
4-Chloro-3-methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
4-Methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	21	J	6.6	J	60	J	< 470		59	J	< 140	
4-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 1800		< 780		< 2000		< 2400		< 1700		< 710	UJ
Acenaphthene	SW8270D	3590000	45200000	--	--	µg/kg	180		47		200		89	J	490		32	
Acenaphthylene	SW8270D	--	--	--	--	µg/kg	31	J	15	J	160		< 96		61	J	14	J
ACETOPHENONE	SW8270D	2520000	2520000	--	--	µg/kg	< 700		< 310		16	J	< 960		< 680		< 280	
Anthracene	SW8270D	17900000	100000000	196949.1525	--	µg/kg	250		61		490		76	J	960		51	
ATRAZINE	SW8270D	2360	9990	3.9	--	µg/kg	< 700		< 310		< 790		< 960		< 680		< 280	
BENZALDEHYDE	SW8270D	174000	818000	--	--	µg/kg	20	J	18	J	52	J-	31	J-	26	J-	16	J
Benzo (a) anthracene	SW8270D	1140	20800	--	--	µg/kg	480		120		950		71	J	**2200**		82	
Benzo (a) pyrene	SW8270D	115	2110	470	--	µg/kg	**400**		110		**610**		48	J	**1800**		68	
Benzo (b) fluoranthene	SW8270D	1150	21100	478.0876494	--	µg/kg	**490**		130		**760**		64	J	**1900**		94	
Benzo (ghi) perylene	SW8270D	--	--	--	--	µg/kg	260		75		410		37	J	1300		53	
Benzo (k) fluoranthene	SW8270D	11500	211000	--	--	µg/kg	210		51		260		26	J	700		36	
Benzo(e)pyrene	SW8270D	--	--	--	--	µg/kg	250	J	70	J	380	J	29	J	1000		50	J
Biphenyl	SW8270D	68500	288000	--	--	µg/kg	30	J	10	J	34	J	< 470		31	J	7.8	J
bis(2-Chloroethoxy) Methane	SW8270D	190000	2460000	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
Bis-(2-Chloroethyl) Ether	SW8270D	286	1290	--	--	µg/kg	< 70		< 31		< 79		< 96		< 68		< 28	
bis(2-Ethylhexyl)phthalate	SW8270D	38800	164000	2880	--	µg/kg	52	J	< 1500		110	J	< 4700		< 3300		< 1400	
Butyl Benzyl Phthalate	SW8270D	286000	1210000	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		12	J
Caprolactam	SW8270D	31300000	100000000	--	--	µg/kg	< 1800	UJ	< 780		< 2000		64	J	< 1700		< 710	UJ
Carbazole	SW8270D	--	--	--	--	µg/kg	110		19	J	76	J	< 96		470		14	J
Chrysene	SW8270D	115000	2110000	144.2231076	--	µg/kg	**560**		120		**1200**		76	J	**2000**		110	
Dibenz (a,h) anthracene	SW8270D	115	2110	--	--	µg/kg	91		43		**170**		< 96		**350**		15	J
Dibenzofuran	SW8270D	73000	1040000	--	--	µg/kg	170	J	42	J	130	J	9.1	J	180	J	33	J
Diethyl Phthalate	SW8270D	50600000	100000000	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
Dimethyl Phthalate	SW8270D	--	--	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
Di-n-Butylphthalate	SW8270D	6320000	82100000	5033.259424	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
Di-n-Octyl phthalate	SW8270D	632000	8210000	--	--	µg/kg	< 350	UJ	< 150		< 390		< 470		< 330		< 140	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM11		ND20-GM12		ND20-GM12		ND20-GM12		ND20-GM12		ND20-GM13	
						Sample ID	ND20-GM11-4060_07/01/2020		ND20-GM12-SURF_06/28/2020		ND20-GM12-0320_07/02/2020		ND20-GM12-2040_07/02/2020		ND20-GM12-4060_07/02/2020		ND20-GM13-SURF_07/01/2020	
						Parent Sample ID	--		--		--		--		--		--	
						Date	07-01-2020		06-28-2020		07-02-2020		07-02-2020		07-02-2020		07-01-2020	
						Sample Depth (ft bss)	4 - 6		0 - 0.3		0.3 - 2		2 - 4		4 - 6		0 - 0.3	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		N		N		N		N		N	
Semi-Volatile Organic Compounds (continued)																		
Fluoranthene	SW8270D	2390000	30100000	88877.80549	--	µg/kg	1000		270		2100		270		5400		230	
Fluorene	SW8270D	2390000	30100000	14829.93197	--	µg/kg	270		58		240		72	J	490		51	
Hexachlorobenzene	SW8270D	252	1150	25.2	--	µg/kg	< 70		< 31		< 79		< 96		< 68		< 28	
Hexachlorobutadiene	SW8270D	1630	7190	--	--	µg/kg	< 70		< 31		< 79		< 96		< 68		< 28	
Hexachlorocyclopentadiene	SW8270D	2550	10800	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
Hexachloroethane	SW8270D	2520	11100	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
Indeno (1,2,3-cd) pyrene	SW8270D	1150	21100	--	--	µg/kg	230		67		380		33	J	1100		46	
Isophorone	SW8270D	571000	2420000	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
Naphthalene	SW8270D	5520	24100	658.1818182	--	µg/kg	280		63		240		12	J	200		49	
Nitrobenzene	SW8270D	7420	32400	--	--	µg/kg	< 700		< 310		< 790		< 950		< 670		< 280	
N-Nitroso-Di-N-Propylamine	SW8270D	77.5	328	--	--	µg/kg	< 70	UJ	< 31		< 79		< 96		< 68		< 28	UJ
N-Nitrosodiphenylamine	SW8270D	111000	469000	76.42622951	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
P-Chloroaniline	SW8270D	2710	11500	--	--	µg/kg	< 350		< 150		< 390		< 470		< 330		< 140	
Pentachlorophenol	SW8270D	1020	3970	2.76	--	µg/kg	< 1800	UJ	< 780		< 2000	UJ	< 2400	UJ	< 1700	UJ	< 710	
Phenanthrene	SW8270D	--	--	--	--	µg/kg	1100		160		880		340		4200		130	
Phenol	SW8270D	19000000	100000000	2294.627383	--	µg/kg	< 350		2.2	J	< 390		< 470		< 330		< 140	
P-Nitroaniline	SW8270D	27100	115000	--	--	µg/kg	< 1800		< 780		< 2000		< 2400		< 1700		< 710	UJ
Pyrene	SW8270D	1790000	22600000	54545.45455	--	µg/kg	1100		230		1600		200		4500		150	
Dioxins/Furans																		
1,2,3,4,6,7,8-HPCDD	E1613B	0.484	2.19	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	0.00493	0.0223	--	--	µg/kg	-		-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	0.164	0.744	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	0.0164	0.0744	--	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDD	E1613B	0.00482	0.0218	0.03	--	µg/kg	-		-		-		-		-		-	
2,3,7,8-TCDF	E1613B	0.0484	0.219	--	--	µg/kg	-		-		-		-		-		-	
OCDD	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
OCDF	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-		-	
Organotins																		
Dibutyl Tin	RESTEK	--	--	--	--	µg/kg	1.6	J	-		-		-		-		< 2.2	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	< 27		-		-		-		-		< 34	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	< 2.3		-		-		-		-		< 2.8	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	5.3		-		-		-		-		4.5	
Other																		
Moisture	SM2540	--	--	--	--	%	37		83		58		91		34		67	
Total Organic Carbon	SW9060	--	--	--	--	mg/kg	17300		23900		22700		41600		15100		18700	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM14		ND20-GM14		ND20-GM14		ND20-GM14		ND20-GM14	
						Sample ID	ND20-GM14-SURF_06/30/2020		ND20-GM14-SURFFD_06/30/2020		ND20-GM14-0320_07/02/2020		ND20-GM14-2040_07/02/2020		ND20-GM14-4060_07/02/2020	
						Parent Sample ID	--		ND20-GM14-SURF_06/30/2020		--		--		--	
						Date	06-30-2020		06-30-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	0 - 0.3		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	**Analytic Method**	**WDNR-SO-NON-IND-RCL**	**WDNR-SO-IND-RCL**	**WDNR-SO-GW-RCL**	**WDNR-SO-BKG**	**Units**	**N**		**FD**		**N**		**N**		**N**	
Metals																
Aluminum	SW6010	77500000	100000000	600000	28721000	µg/kg	**6340000**		**5790000**		**7940000**		**13900000**		**12500000**	
Antimony	SW6010	31300	467000	542	--	µg/kg	< 6100		< 6400		< 7500		< 6700		< 7200	
Arsenic	SW6010	677	3000	584	8300	µg/kg	**2900**		**2800**		**3400**		**3600**		**3900**	
Barium	SW6010	15300000	100000000	164800	364000	µg/kg	39000		39000		58400		95000		84100	
Beryllium	SW6010	156000	2300000	6320	--	µg/kg	280	J	260	J	440	J	760		710	
Cadmium	SW6010	71100	985000	752	1070	µg/kg	180	J	180	J	430	J	260	J	280	J
Calcium Metal	SW6010	--	--	--	14536000	µg/kg	5990000		6170000		11200000		**18300000**		**16600000**	
Chromium	SW6010	--	--	360000000	43500	µg/kg	14100		13600		18900		28800		32500	
Cobalt	SW6010	23400	347000	3607.321132	22000	µg/kg	**5200**		**4900**	J	**7200**		**11700**		**10900**	
Copper	SW6010	3130000	46700000	91600	35400	µg/kg	9400		9000		18900		25500		27300	
Iron	SW6010	54800000	100000000	--	34314000	µg/kg	14000000		13100000		17000000		23300000		21200000	
Lead	SW6010	400000	800000	27000	51600	µg/kg	6500		6400		**70700**		7400		7000	
Magnesium	SW6010	--	--	--	8290000	µg/kg	4110000		4210000		7400000		**14500000**		**12600000**	
Manganese	SW6010	1830000	25900000	39124.42396	2937000	µg/kg	**461000**	*	**362000**	*	**302000**		**588000**		**521000**	
Mercury	SW6010	3130	3130	208	--	µg/kg	< 150		< 130		130	J	< 140		< 140	
Nickel	SW6010	1550000	22500000	13061.22449	30800	µg/kg	12000		11600		**17200**		**28500**		**28300**	
Potassium	SW6010	--	--	--	--	µg/kg	756000		700000		978000		2040000		1840000	
Selenium	SW6010	391000	5840000	520	--	µg/kg	**560**	**J**	< 3700		**730**	**J**	< 3900		< 4200	
Silver	SW6010	391000	5840000	849.0967056	--	µg/kg	< 1000		< 1100		120	J	< 1100		< 1200	
Sodium	SW6010	--	--	--	--	µg/kg	215000	J	206000	J	221000	J	331000	J	326000	J
Thallium	SW6010	782	11700	284	--	µg/kg	< 2600		< 2700		< 3100		< 2800		< 3000	
Vanadium	SW6010	393000	5840000	60000	85000	µg/kg	29200		28100		29300		43300		41900	
Zinc	SW6010	23500000	100000000	--	150000	µg/kg	35200		34200		92000		47300		40800	
Polychlorinated Biphenyls																
Aroclor 1016	SW8081	4110	28000	--	--	µg/kg	-		-		-		-		-	
Aroclor 1221	SW8081	213	883	--	--	µg/kg	-		-		-		-		-	
Aroclor 1232	SW8081	190	792	--	--	µg/kg	-		-		-		-		-	
Aroclor 1242	SW8081	235	972	--	--	µg/kg	-		-		-		-		-	
Aroclor 1248	SW8081	236	975	--	--	µg/kg	-		-		-		-		-	
Aroclor 1254	SW8081	239	988	--	--	µg/kg	-		-		-		-		-	
Aroclor 1260	SW8081	243	1000	--	--	µg/kg	-		-		-		-		-	
Aroclor 1262	SW8081	--	--	--	--	µg/kg	-		-		-		-		-	
Aroclor 1268	SW8081	--	--	--	--	µg/kg	-		-		-		-		-	
Total PCBs (NDs=0)	Calculated	234	967	9.4	--	µg/kg	-		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM14		ND20-GM14		ND20-GM14		ND20-GM14		ND20-GM14	
						Sample ID	ND20-GM14-SURF_06/30/2020		ND20-GM14-SURFFD_06/30/2020		ND20-GM14-0320_07/02/2020		ND20-GM14-2040_07/02/2020		ND20-GM14-4060_07/02/2020	
						Parent Sample ID	--		ND20-GM14-SURF_06/30/2020		--		--		--	
						Date	06-30-2020		06-30-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	0 - 0.3		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		FD		N		N		N	
Volatile Organic Compounds																
1,1,1-Trichloroethane	SW8260	640000	640000	140.2	--	µg/kg	-		-		-		-		-	
1,1,2,2-Tetrachloroethane	SW8260	810	3600	0.156406869	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloro-1,2,2-trifluoroethane	SW8260	910000	910000	--	--	µg/kg	-		-		-		-		-	
1,1,2-Trichloroethane	SW8260	1590	7010	3.24	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethane	SW8260	5060	22200	483.4181818	--	µg/kg	-		-		-		-		-	
1,1-Dichloroethene	SW8260	320000	1190000	5.02	--	µg/kg	-		-		-		-		-	
1,2,4-Trichlorobenzene	SW8260	24000	113000	408	--	µg/kg	-		-		-		-		-	
1,2-Dibromo-3-chloropropane (DBCP)	SW8260	7.5	92.3	0.1728	--	µg/kg	-		-		-		-		-	
1,2-Dibromoethane	SW8260	50	221	0.0282	--	µg/kg	-		-		-		-		-	
1,2-Dichlorobenzene	SW8260	376000	376000	1168	--	µg/kg	-		-		-		-		-	
1,2-Dichloroethane	SW8260	652	2870	2.84	--	µg/kg	-		-		-		-		-	
1,2-Dichloropropane	SW8260	3400	15000	3.32	--	µg/kg	-		-		-		-		-	
1,4-Dichlorobenzene	SW8260	3740	16400	144	--	µg/kg	-		-		-		-		-	
2-Butanone	SW8260	28400000	28400000	1666.068223	--	µg/kg	-		-		-		-		-	
2-Hexanone	SW8260	237000	1760000	--	--	µg/kg	-		-		-		-		-	
4-Methyl-2-pentanone	SW8260	3360000	3360000	225.2396166	--	µg/kg	-		-		-		-		-	
Acetone	SW8260	63400000	100000000	3676.595745	--	µg/kg	-		-		-		-		-	
Benzene	SW8260	1600	7070	5.12	--	µg/kg	-		-		-		-		-	
Bromodichloromethane	SW8260	418	1830	0.3255	--	µg/kg	-		-		-		-		-	
Bromoform	SW8260	25400	113000	2.332	--	µg/kg	-		-		-		-		-	
Bromomethane	SW8260	9600	43000	5.059602649	--	µg/kg	-		-		-		-		-	
Carbon Disulfide	SW8260	738000	738000	591.8618989	--	µg/kg	-		-		-		-		-	
Carbon Tetrachloride	SW8260	916	4030	3.88	--	µg/kg	-		-		-		-		-	
Dichlorodifluoromethane (CFC-12)	SW8260	126000	530000	3086.294416	--	µg/kg	-		-		-		-		-	
Chlorobenzene	SW8260	370000	761000	135.8	--	µg/kg	-		-		-		-		-	
Chloroethane	SW8260	2120000	2120000	226.6028708	--	µg/kg	-		-		-		-		-	
Chloroform	SW8260	454	1980	3.33	--	µg/kg	-		-		-		-		-	
Chloromethane	SW8260	159000	669000	15.5106383	--	µg/kg	-		-		-		-		-	
cis-1,2-Dichloroethene	SW8260	156000	2340000	41.2	--	µg/kg	-		-		-		-		-	
cis-1,3-Dichloropropene	SW8260	1210000	1210000	--	--	µg/kg	-		-		-		-		-	
Cyclohexane	SW8260	117000	117000	--	--	µg/kg	-		-		-		-		-	
Dibromochloromethane	SW8260	8280	38900	31.95	--	µg/kg	-		-		-		-		-	
Ethylbenzene	SW8260	8020	35400	1570	--	µg/kg	-		-		-		-		-	
Isopropylbenzene	SW8260	268000	268000	--	--	µg/kg	-		-		-		-		-	
M-Dichlorobenzene	SW8260	297000	297000	1152.77434	--	µg/kg	-		-		-		-		-	
Methyl Acetate	SW8260	29000000	29000000	--	--	µg/kg	-		-		-		-		-	
Methyl tert-Butyl Ether	SW8260	63800	282000	27.02097902	--	µg/kg	-		-		-		-		-	
Methylcyclohexane	SW8260	67600	67600	--	--	µg/kg	-		-		-		-		-	
Methylene Chloride	SW8260	61800	1150000	2.56	--	µg/kg	-		-		-		-		-	
Styrene	SW8260	867000	867000	220	--	µg/kg	-		-		-		-		-	
Tetrachloroethene	SW8260	33000	145000	4.54	--	µg/kg	-		-		-		-		-	
Toluene	SW8260	818000	818000	1107.2	--	µg/kg	-		-		-		-		-	
trans-1,2-Dichloroethene	SW8260	1560000	1850000	62.6	--	µg/kg	-		-		-		-		-	
trans-1,3-Dichloropropene	SW8260	1510000	1510000	--	--	µg/kg	-		-		-		-		-	
Trichloroethene	SW8260	1300	8410	3.58	--	µg/kg	-		-		-		-		-	
Trichlorofluoromethane	SW8260	1230000	1230000	4477.48062	--	µg/kg	-		-		-		-		-	
Vinyl Chloride	SW8260	66.8	2080	0.138	--	µg/kg	-		-		-		-		-	
m,p-Xylene	SW8260	--	--	--	--	µg/kg	-		-		-		-		-	
o-Xylene	SW8260	434000	434000	--	--	µg/kg	-		-		-		-		-	
Xylenes (total)	SW8260	260000	260000	3960	--	µg/kg	-		-		-		-		-	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM14		ND20-GM14		ND20-GM14		ND20-GM14		ND20-GM14	
						Sample ID	ND20-GM14-SURF_06/30/2020		ND20-GM14-SURFFD_06/30/2020		ND20-GM14-0320_07/02/2020		ND20-GM14-2040_07/02/2020		ND20-GM14-4060_07/02/2020	
						Parent Sample ID	--		ND20-GM14-SURF_06/30/2020		--		--		--	
						Date	06-30-2020		06-30-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	0 - 0.3		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		FD		N		N		N	
Semi-Volatile Organic Compounds																
2,2'-Oxybis(1-Chloropropane)	SW8270D	1020000	1020000	--	--	µg/kg	< 9.8		< 9.4		< 45		< 4.8		< 4.8	
2,4,5-Trichlorophenol	SW8270D	6320000	82100000	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
2,4,6-Trichlorophenol	SW8270D	49300	209000	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
2,4-Dichlorophenol	SW8270D	190000	2460000	--	--	µg/kg	< 9.8		< 9.4		< 45		< 4.8		< 4.8	
2,4-Dimethyl Phenol	SW8270D	1260000	16400000	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
2,4-Dinitrophenol	SW8270D	126000	1640000	--	--	µg/kg	< 480		< 460		< 2200		< 230		< 240	
2,4-Dinitrotoluene	SW8270D	1740	7370	0.135443038	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
2,6-Dinitrotoluene	SW8270D	363	1540	0.137525773	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
2-Chloronaphthalene	SW8270D	4780000	60300000	--	--	µg/kg	< 9.8		< 9.4		< 45		< 4.8		< 4.8	
2-Chlorophenol	SW8270D	391000	5840000	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
2-Methylnaphthalene	SW8270D	239000	3010000	--	--	µg/kg	9.5	J	11		160		< 4.8		< 4.8	
2-Methylphenol	SW8270D	3160000	41000000	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
2-Nitroaniline	SW8270D	627000	8010000	--	--	µg/kg	< 250		< 240		< 1100		< 120		< 120	
2-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
3,3'-Dichlorobenzidine	SW8270D	1210	5110	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
3-Nitroaniline	SW8270D	--	--	--	--	µg/kg	< 250		< 240		< 1100		< 120		< 120	
4,6-Dinitro-2-Methylphenol	SW8270D	5060	65700	--	--	µg/kg	< 250		< 240		< 1100		< 120		< 120	
4-Bromodiphenyl ether	SW8270D	26900	26900	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
4-Chloro-3-methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
4-Chlorodiphenyl ether	SW8270D	--	--	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
4-Methylphenol	SW8270D	6320000	82100000	--	--	µg/kg	< 48		< 46		39	J	< 23		< 24	
4-Nitrophenol	SW8270D	--	--	--	--	µg/kg	< 250		< 240		< 1100		< 120		< 120	
Acenaphthene	SW8270D	3590000	45200000	--	--	µg/kg	20		26		360		< 4.8		< 4.8	
Acenaphthylene	SW8270D	--	--	--	--	µg/kg	5.5	J	5	J	36	J	< 4.8		< 4.8	
ACETOPHENONE	SW8270D	2520000	2520000	--	--	µg/kg	< 98		< 94		< 450		< 48		1.6	J
Anthracene	SW8270D	17900000	100000000	196949.1525	--	µg/kg	22		24		530		< 4.8		< 4.8	
ATRAZINE	SW8270D	2360	9990	3.9	--	µg/kg	< 98		< 94		< 450		< 48		< 48	
BENZALDEHYDE	SW8270D	174000	818000	--	--	µg/kg	2.8	J	< 94		< 450		7.2	J	15	J
Benzo (a) anthracene	SW8270D	1140	20800	--	--	µg/kg	40		50		860		< 4.8		< 4.8	
Benzo (a) pyrene	SW8270D	115	2110	470	--	µg/kg	37		46		720		< 4.8		< 4.8	
Benzo (b) fluoranthene	SW8270D	1150	21100	478.0876494	--	µg/kg	44		57		810		< 4.8		< 4.8	
Benzo (ghi) perylene	SW8270D	--	--	--	--	µg/kg	27		38		440		< 4.8		< 4.8	
Benzo (k) fluoranthene	SW8270D	11500	211000	--	--	µg/kg	17		21		260		< 4.8		< 4.8	
Benzo(e)pyrene	SW8270D	--	--	--	--	µg/kg	24	J	32	J	420		< 23		< 24	
Biphenyl	SW8270D	68500	288000	--	--	µg/kg	2.6	J	2.4	J	40	J	0.67	J	0.81	J
bis(2-Chloroethoxy) Methane	SW8270D	190000	2460000	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
Bis-(2-Chloroethyl) Ether	SW8270D	286	1290	--	--	µg/kg	< 9.8		< 9.4		< 45		< 4.8		< 4.8	
bis(2-Ethylhexyl)phthalate	SW8270D	38800	164000	2880	--	µg/kg	8	J	11	J	< 2200		10	J	< 240	
Butyl Benzyl Phthalate	SW8270D	286000	1210000	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
Caprolactam	SW8270D	31300000	100000000	--	--	µg/kg	< 250	UJ	< 240	UJ	< 1100		< 120		6.8	J
Carbazole	SW8270D	--	--	--	--	µg/kg	5.4	J	3.8	J	190		< 4.8		< 4.8	
Chrysene	SW8270D	115000	2110000	144.2231076	--	µg/kg	44		54		860		< 4.8		< 4.8	
Dibenz (a,h) anthracene	SW8270D	115	2110	--	--	µg/kg	7.4	J	11		140		< 4.8		< 4.8	
Dibenzofuran	SW8270D	73000	1040000	--	--	µg/kg	16	J	12	J	190	J	< 23		< 24	
Diethyl Phthalate	SW8270D	50600000	100000000	--	--	µg/kg	< 48		1.8	J	< 220		0.9	J	< 24	
Dimethyl Phthalate	SW8270D	--	--	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
Di-n-Butylphthalate	SW8270D	6320000	82100000	5033.259424	--	µg/kg	< 48		2.6	J	< 220		< 23		0.71	J
Di-n-Octyl phthalate	SW8270D	632000	8210000	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

						Location	ND20-GM14		ND20-GM14		ND20-GM14		ND20-GM14		ND20-GM14	
						Sample ID	ND20-GM14-SURF_06/30/2020		ND20-GM14-SURFFD_06/30/2020		ND20-GM14-0320_07/02/2020		ND20-GM14-2040_07/02/2020		ND20-GM14-4060_07/02/2020	
						Parent Sample ID	--		ND20-GM14-SURF_06/30/2020		--		--		--	
						Date	06-30-2020		06-30-2020		07-02-2020		07-02-2020		07-02-2020	
						Sample Depth (ft bss)	0 - 0.3		0 - 0.3		0.3 - 2		2 - 4		4 - 6	
Parameter	Analytic Method	WDNR-SO-NON-IND-RCL	WDNR-SO-IND-RCL	WDNR-SO-GW-RCL	WDNR-SO-BKG	Units	N		FD		N		N		N	
Semi-Volatile Organic Compounds (continued)																
Fluoranthene	SW8270D	2390000	30100000	88877.80549	--	µg/kg	98		120		2400		1.3	J	0.92	J
Fluorene	SW8270D	2390000	30100000	14829.93197	--	µg/kg	29		20		370		0.7	J	< 4.8	
Hexachlorobenzene	SW8270D	252	1150	25.2	--	µg/kg	< 9.8		< 9.4		< 45		< 4.8		< 4.8	
Hexachlorobutadiene	SW8270D	1630	7190	--	--	µg/kg	< 9.8		< 9.4		< 45		< 4.8		< 4.8	
Hexachlorocyclopentadiene	SW8270D	2550	10800	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
Hexachloroethane	SW8270D	2520	11100	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
Indeno (1,2,3-cd) pyrene	SW8270D	1150	21100	--	--	µg/kg	22		32		400		< 4.8		< 4.8	
Isophorone	SW8270D	571000	2420000	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
Naphthalene	SW8270D	5520	24100	658.1818182	--	µg/kg	17		24		260		< 4.8		< 4.8	
Nitrobenzene	SW8270D	7420	32400	--	--	µg/kg	< 98		< 93		< 450		< 47		< 48	
N-Nitroso-Di-N-Propylamine	SW8270D	77.5	328	--	--	µg/kg	< 9.8		< 9.4		< 45		< 4.8		< 4.8	
N-Nitrosodiphenylamine	SW8270D	111000	469000	76.42622951	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
P-Chloroaniline	SW8270D	2710	11500	--	--	µg/kg	< 48		< 46		< 220		< 23		< 24	
Pentachlorophenol	SW8270D	1020	3970	2.76	--	µg/kg	< 250		< 240		< 1100		< 120		< 120	
Phenanthrene	SW8270D	--	--	--	--	µg/kg	48		47		3100		1.7	J	1.2	J
Phenol	SW8270D	19000000	100000000	2294.627383	--	µg/kg	0.76	J	< 46		< 220		< 23		< 24	
P-Nitroaniline	SW8270D	27100	115000	--	--	µg/kg	< 250		< 240		< 1100		< 120		< 120	
Pyrene	SW8270D	1790000	22600000	54545.45455	--	µg/kg	68		86		2100		< 4.8		< 4.8	
Dioxins/Furans																
1,2,3,4,6,7,8-HPCDD	E1613B	0.484	2.19	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,6,7,8-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8,9-HPCDF	E1613B	0.49	2.22	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-	
1,2,3,4,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-	
1,2,3,6,7,8-HXCDF	E1613B	0.0485	0.22	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDD	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8,9-HxCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDD	E1613B	0.00493	0.0223	--	--	µg/kg	-		-		-		-		-	
1,2,3,7,8-PeCDF	E1613B	0.164	0.744	--	--	µg/kg	-		-		-		-		-	
2,3,4,6,7,8-HXCDF	E1613B	0.0493	0.223	--	--	µg/kg	-		-		-		-		-	
2,3,4,7,8-PECDF	E1613B	0.0164	0.0744	--	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDD	E1613B	0.00482	0.0218	0.03	--	µg/kg	-		-		-		-		-	
2,3,7,8-TCDF	E1613B	0.0484	0.219	--	--	µg/kg	-		-		-		-		-	
OCDD	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-	
OCDF	E1613B	16.4	74.4	--	--	µg/kg	-		-		-		-		-	
Organotins																
Dibutyl Tin	RESTEK	--	--	--	--	µg/kg	< 1.9		< 1.8		< 1.8		< 1.8		< 1.8	
Monobutyltin as ion	RESTEK	--	--	--	--	µg/kg	< 29		< 28		< 29		< 29		< 29	
Tetrabutyl Tin	RESTEK	--	--	--	--	µg/kg	< 2.4		< 2.3		< 2.4		< 2.4		< 2.4	
Tri-n-butyltin hydride	RESTEK	23500	350000	--	--	µg/kg	< 2.1		< 2.1		< 2.1		< 2.1		< 2.1	
Other																
Moisture	SM2540	--	--	--	--	%	46		40		35		42		45	
Total Organic Carbon	SW9060	--	--	--	--	mg/kg	9640		8260		17400		9490		13700	

Table 4-2.2
2020 Sediment Analytical Results-Human Health Assessment
General Mills Slip - Superior, WI

Footnotes:
< : Denotes concentration less than indicated detection limit
WDNR = Wisconsin Department of Natural Resources
RCL = Residual Contaminent Level
Values are shaded based on the highest comparison criteria exceeded.
Exceeds WDNR-SO-NON-IND-RCL = The Non-Industrial Soil Direct Contact RCL (Wis. Admin. Code NR 720)
Exceeds WDNR-SO-IND-RCL = The Industrial Soil Direct Contact RCL (Wis. Admin. Code NR 720)
Exceeds WDNR-SO-GW-RCL = The Soil-to-Groundwater RCL (Wis. Admin. Code NR 720)
Exceeds WDNR-SO-BKG = The Soil Background RCL (Wis. Admin. Code NR 720)
ND = Non Detect
N = Sample type is a normal sample.
FD = Sample type is a field duplicate sample.
"-" = Not analyzed
"--" = No Standard/Guideline
PCB = Polychlorinated Biphenyls
µg/kg = microgram per kilogram
mg/kg = milligrams per kilograms
ft bss = feet below sediment surface
% = percent
* = Post-digestion spike at 2 times the parent concentration.
The concentration is an estimated value.
J1 = Result is estimated but biased low.
J+ = Result is estimated but biased high.
UJ = Analyte is not detected above the reported limit and the limit is estimated.

Table 6-1
General Mills Slip Sediment Chemistry Summary Statistics
General Mills Slip - Superior, WI

Surface										
Chemical	**Units**	**Number of Samples**	**Number of Detects**	**Number of Nondetects**	**Minimum**	**Maximum**	**Mean of Detects**	**Median of Detects**	**Distribution/Statistic**	**EPC[1]**
Aroclor 1248	µg/kg	9	0	9	--	--	--	--	--	--
Aroclor 1254	µg/kg	9	1	8	21	21	21	21	Maximum[6]	21
Aroclor 1260	µg/kg	9	6	3	6	32	15	14	Normal - 95% KM (t) UCL[2]	22.1
Aroclor 1262	µg/kg	5	1	4	33	33	33	33	Maximum[6]	33
Dibenzofuran	µg/kg	15	15	0	16	400	99.8	59	Gamma - 95% Adjusted Gamma UCL[15]	161
4,4'-DDD	µg/kg	3	3	0	1.1	110	40.3	9.9	Maximum[6]	110
4,4'-DDE	µg/kg	3	2	1	3.5	5.5	4.5	4.5	Maximum[6]	5.5
4,4'-DDT	µg/kg	3	3	0	0.61	11	5.77	5	Maximum[6]	11
Total DDT	µg/kg	3	3	0	1.71	121	49.1	24.4	Maximum[6]	121
Dieldrin	µg/kg	3	0	3	--	--	--	--	--	--
Total PAHs[3] (U=0)[12]	µg/kg	18	18	0	700	18000	5272	4150	Approximate Normal - Students-t UCL[4]	6984
Total PAHs[3] (U=1/2 MDL)[13]	µg/kg	18	18	0	700	18000	5272	4150	Approximate Normal - Students-t UCL[4]	6984
Total PAHs[3] (U=1/2 RL)[14]	µg/kg	18	18	0	700	18000	5272	4150	Approximate Normal - Students-t UCL[4]	6984
Antimony	mg/kg	19	3	15	0.51	0.9	0.687	0.65	Approximate Normal - 95% KM (t) UCL[2]	0.884
Cadmium	mg/kg	19	15	4	0.18	0.66	0.443	0.43	Normal - 95% KM (t) UCL[2]	0.507
Iron	mg/kg	19	19	0	14000	36000	24311	22600	Normal - Students-t UCL[4]	27135
Manganese	mg/kg	19	19	0	285	1130	629	595	Normal - Students-t UCL[4]	711
TEQ WHO[5]	ng TEQ/kg	3	3	0	11.6	124	58	39.00	Maximum[6]	124
TEQ Fish[7]	ng TEQ/kg	3	3	0	7.8	53.9	28.0	22.2	Maximum[6]	53.9
TEQ Birds[8]	ng TEQ/kg	3	3	0	9.4	52.7	28.4	23.3	Maximum[6]	52.7
Total Organic Carbon	mg/kg	19	19	0	9640	100000	49781	46300	Normal - Students-t UCL[4]	61014
					9.4	52.7	28	23.3		

Table 6-1
General Mills Slip Sediment Chemistry Summary Statistics
General Mills Slip - Superior, WI

Subsurface										
Chemical	Units	Number of Samples	Number of Detects	Number of Nondetects	Minimum	Maximum	Mean of Detects	Median of Detects	Distribution/Statistic	EPC[1]
Aroclor 1248	µg/kg	14	1	13	500	500	500	500	Maximum[6]	500
Aroclor 1254	µg/kg	14	5	9	12	40	50	36	Approximate Normal - 95% KM (t) UCL[2]	53.3
Aroclor 1260	µg/kg	14	8	6	3.7	150	39.9	23	Approximate Normal - 95% KM (t) UCL[2]	50.2
Aroclor 1262	µg/kg	9	2	7	20	40	30	30	Maximum[6]	40
Dibenzofuran	µg/kg	53	47	6	0.16	2000	345	230	Nonparametric - 95% KM (t) UCL[2,16]	388
4,4'-DDD	µg/kg	2	2	0	27	81	54	54	Maximum[6]	81
4,4'-DDE	µg/kg	2	1	1	1.4	1.4	1.4	1.4	Maximum[6]	1.4
4,4'-DDT	µg/kg	2	2	0	1.8	190	95.9	95.9	Maximum[6]	190
Total DDT	µg/kg	2	2	0	30.2	271	151	151	Maximum[6]	271
Dieldrin	µg/kg	2	1	1	0.92	0.92	0.92	0.92	Maximum[6]	0.92
Total PAHs[3] (U=0)[12]	µg/kg	61	61	0	0.56	150000	20555	13000	Nonparametric - Students-t UCL[4,16]	25679
Total PAHs[3] (U=1/2 MDL)[13]	µg/kg	61	61	0	13	150000	20557	13000	Nonparametric - Students-t UCL[4,16]	25681
Total PAHs[3] (U=1/2 RL)[14]	µg/kg	61	61	0	27	150000	20595	13000	Nonparametric - Students-t UCL[4,16]	25722
Antimony	mg/kg	60	16	44	0.49	2.2	0.859	0.745	Nonparametric - 95% KM (t) UCL[2]	1.03
Cadmium	mg/kg	54	54	0	0.14	1.3	0.553	0.53	Approximate Normal - Students-t UCL[4]	0.623
Iron	mg/kg	60	60	0	7300	30300	17856	18600	Normal - Students-t UCL[4]	18972
Manganese	mg/kg	60	60	0	141	663	314	288	Gamma - 95% Approximate Gamma UCL[10]	338
TEQ WHO[5]	ng TEQ/kg	0	--	--	--	--	--	--	--	--
TEQ Fish[7]	ng TEQ/kg	0	--	--	--	--	--	--	--	--
TEQ Birds[8]	ng TEQ/kg	0	--	--	--	--	--	--	--	--
Total Organic Carbon	mg/kg	60	57	3	1760	90300	34777	33300	Normal - 95% KM (t) UCL[2]	37734

Table 6-1
General Mills Slip Sediment Chemistry Summary Statistics
General Mills Slip - Superior, WI

All Intervals										
Chemical	**Units**	**Number of Samples**	**Number of Detects**	**Number of Nondetects**	**Minimum**	**Maximum**	**Mean of Detects**	**Median of Detects**	**Distribution/Statistic**	**EPC[1]**
Aroclor 1248	µg/kg	23	1	22	500	500	500	500	Maximum[6]	500
Aroclor 1254	µg/kg	23	6	17	12	140	45.2	31	Approximate Gamma - 95% KM Adjusted Gamma UCL[15]	43.8
Aroclor 1260	µg/kg	23	14	9	3.7	150	29.2	15.5	Gamma - 95% KM Adjusted Gamma UCL[15]	42.4
Aroclor 1262	µg/kg	14	3	11	20	40	31	33	Normal - 95% KM (t) UCL[2]	39.7
Dibenzofuran	µg/kg	67	61	6	0.16	2000	284	180	Gamma - 95% Adjusted Gamma UCL[15]	342
4,4'-DDD	µg/kg	5	5	0	1.1	110	45.8	27	Maximum[6]	110
4,4'-DDE	µg/kg	5	3	2	1.4	5.5	3.47	3.5	Maximum[6]	5.5
4,4'-DDT	µg/kg	5	5	0	0.61	190	41.8	5.7	Maximum[6]	190
Total DDT	µg/kg	5	5	0	1.71	271	89.7	30.2	Maximum[6]	271
Dieldrin	µg/kg	5	1	4	0.92	0.92	0.92	0.92	Maximum[6]	0.92
Total PAHs[3] (U=0)[12]	µg/kg	78	78	0	0.56	150000	17270	9750	Nonparametric - Students-t UCL[4,16]	21443
Total PAHs[3] (U=1/2 MDL)[13]	µg/kg	78	78	0	13	150000	17271	9750	Gamma - 95% Approximate Gamma UCL[16]	23009
Total PAHs[3] (U=1/2 RL)[14]	µg/kg	78	78	0	27	150000	17302	9750	Approximate Gamma - 95% Approximate Gamma UCL[10]	22725
Antimony	mg/kg	78	19	59	0.49	2.2	0.832	0.74	Approx. Lognormal - H-UCL (KM-log)[11]	0.884
Cadmium	mg/kg	72	68	4	0.14	1.3	0.528	0.52	Approximate Normal - 95% KM (t) UCL[2]	0.586
Iron	mg/kg	78	78	0	7300	36000	19423	20100	Normal - Students-t UCL[4]	20617
Manganese	mg/kg	78	78	0	141	1130	391	332	Approx. Lognormal - H-UCL[9]	428
TEQ WHO[5]	ng TEQ/kg	3	3	0	11.6	124	58	39.00	Maximum[6]	124
TEQ Fish[7]	ng TEQ/kg	3	3	0	9.4	52.7	28	23.3	Maximum[6]	52.7
TEQ Birds[8]	ng TEQ/kg	3	3	0	7.8	53.9	28	22.2	Maximum[6]	53.9
Total Organic Carbon	mg/kg	78	75	3	1760	100000	38395	35300	Normal - 95% KM (t) UCL[2]	41544

Notes:

1. Exposure Point Concentration
2. Kaplan Meier 95% Upper Confidence Limit of the Mean (95% UCL)
3. Total PAHs - total polycyclic aromatic hydrocarbons based on sum of 18 PAHs - Nondeteccts equal to the Reporting Limit
4. Students-t 95% UCL
5. 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) Toxic Equivalency (TEQ) - 2005 World Health Organization TEQs for Humans and Mammals
6. Maximum value selected as there insufficient sample to calculate a reliable 95% Upper Confidence Limit
7. TCDD TEQs for Fish - Van den Berg et al. (1998)
8. TCDD TEQs for Birds - Van den Berg et al. (1998)
9. H-Statistic 95% UCL
10. Approximate gamma 95% UCL
11. H-Statistic (Kaplan-Meier-Log) 95% UCL
12. Nondects treated as 0
13. Nondects treated as 1/2 the Method Detection Limit
14. Nondects treated as 1/2 the Reporting Limit
15. Adjusted gamma 95% UCL
16. Nonparametric - Data do not follow a discernable distribution.

Table 6-2
Calculation of 2,3,7,8-TCDD Toxicity Equivalents
General Mills Slip - Superior, WI

Dioxin/Furan Congener	Units	TEF WHO[1] (unitless)	TEF Birds[2] (unitless)	TEF Fish[2] (unitless)	ND20-GM02		ND20-GM04		ND20-GM08	
					ND20-GM02-SURF_07/01/2020		ND20-GM04-SURF_06/30/2020		ND20-GM08-SURF_06/29/2020	
					2020-Jul-01		2020-Jun-30		2020-Jun-29	
					0 - 0.3		0 - 0.3		0 - 0.3	
1,2,3,4,6,7,8-HPCDD	ng/kg	0.01	0.0001	0.001	4900	B	1200	B	290	B
1,2,3,4,6,7,8-HPCDF	ng/kg	0.01	0.01	0.01	880	B	450	B	190	B
1,2,3,6,7,8,9-HPCDF	ng/kg	0.01	0.01	0.01	40	B	11	B	3.04	J B
1,2,3,4,7,8-HxCDD	ng/kg	0.1	0.05	0.5	22		6.91	J B	2.06	J B
1,2,3,4,7,8-HXCDF	ng/kg	0.1	0.1	0.1	56		16		4.5	J
1,2,3,6,7,8-HxCDD	ng/kg	0.1	0.01	0.01	110		30		9.2	B
1,2,3,6,7,8-HXCDF	ng/kg	0.1	0.1	0.1	22		17	I	5.6	
1,2,3,7,8,9-HxCDD	ng/kg	0.1	0.1	0.01	54	B	18		6.6	B
1,2,3,7,8,9-HxCDF	ng/kg	0.1	0.1	0.1	< 21		1.1	J	< 4.9	
1,2,3,7,8-PeCDD	ng/kg	1	1	1	< 21	J B	3.5	J	1.5	J
1,2,3,7,8-PeCDF	ng/kg	0.03	0.1	0.05	10	J	2.8	J	0.87	J
2,3,4,6,7,8-HXCDF	ng/kg	0.1	0.1	0.1	9.2	J	3.1	J	1.3	J
2,3,4,7,8-PECDF	ng/kg	0.3	1	0.5	9.7	J	3.1	J	1.15	J B
2,3,7,8-TCDD	ng/kg	1	1	1	1.7	J	1	J	0.67	J
2,3,7,8-TCDF	ng/kg	0.1	1	0.05	3.1	J	2		1.6	
OCDD	ng/kg	0.0003	0.0001	0.0001	110000	E B	24000	E B	3800	B
OCDF	ng/kg	0.0003	0.0001	0.0001	2400	B	750	B	170	B
TEQ WHO[3]	ng/kg				124		39.0		11.6	
TEQ Birds[4]	ng/kg				52.7		23.3		9.4	
TEQ Fish[4]	ng/kg				53.9		22.2		7.8	

Notes:

Nondetects counted as 0

1. TEF - Toxicity equivalency factor based on 2,3,7,8-tetrachlorodibenzo-para-dioxin (TCDD) (World Health Organization 2005)
2. TEF - Toxicity equivalency factor based on 2,3,7,8-TCDD (Van den Burg et al. 1998)
3. TEQ - 2,3,7,8-TCDD Toxicity equivalents calculated for humans and mammals (WHO 2005)
4. TEQ - 2,3,7,8-TCDD Toxicity equivalents calculated for fish and birds (Van den Burg et al. 1998)

Table 6-3
Human Health Noncarcinogenic Hazards and Carcinogenic Risks
General Mills Slip - Superior, WI

Surface										
Chemical	Units	Sediment Exposure Concentration[1]	Fish BSAF[3]	Fraction Organic Carbon (unitless)	Fraction Whole-body Lipid (unitless)	Fish Tissue Concentration	Noncarcinogenic Screeninig Level (HQ=1)	Carcinogenic Screeninig Level (Risk = 1E-06)	Noncarcinogenic Hazard (Unitless)	Carcinogenic Risk (Unitless)
4,4'-DDD[4]	µg/kg	110	0.28	0.050	0.028	17.2	2780	62.4	0.006	3E-07
4,4'-DDE[4]	µg/kg	5.5	7.7	0.050	0.028	23.7	2780	44.0	0.009	5E-07
4,4'-DDT[4]	µg/kg	11	1.67	0.050	0.028	10.3	2780	44.0	0.004	2E-07
Aroclor 1248	µg/kg	Aroclor 1248 was not detected in the surface interval								
Aroclor 1254	µg/kg	21	1.85	0.050	0.028	21.8	111	7.49	0.2	3E-06
Aroclor 1260	µg/kg	22.1	1.85	0.050	0.028	22.9	--	7.49	--	3E-06
Dieldrin	µg/kg	Dieldrin was not detected in the surface interval								
TEQs[2,4]	ug TEQ/kg	0.124	0.059	0.050	0.028	4.10E-03	3.89E-03	1.15E-04	1	4E-05
Mercury	mg/kg	0.0802	4.4	--	--	0.35	0.556	--	0.6	--
Cumulative Hazard/Risk									**2**	**4E-05**

Subsurface										
Chemical	Units	Sediment Exposure Concentration[1]	Fish BSAF[3]	Fraction Organic Carbon (unitless)	Fraction Whole-body Lipid (unitless)	Fish Tissue Concentration	Noncarcinogenic Screeninig Level (HQ=1)	Carcinogenic Screeninig Level (Risk = 1E-06)	Noncarcinogenic Hazard (Unitless)	Carcinogenic Risk (Unitless)
4,4'-DDD[4]	µg/kg	81	0.28	0.033	0.028	19.2	2780	62.4	0.007	3E-07
4,4'-DDE[4]	µg/kg	1.4	7.7	0.033	0.028	9.1	2780	44.0	0.003	2E-07
4,4'-DDT[4]	µg/kg	190	1.67	0.033	0.028	269	2780	44.0	0.10	6E-06
Aroclor 1248[4]	µg/kg	500	1.85	0.033	0.028	785	--	7.49	--	1E-04
Aroclor 1254	µg/kg	53.3	1.85	0.033	0.028	84	111	7.49	0.8	1E-05
Aroclor 1260	µg/kg	50.2	1.85	0.033	0.028	79	--	7.49	--	1E-05
Dieldrin	µg/kg	0.92	1.85	0.033	0.028	1.44	278	0.94	0.005	2E-06
TEQs[2]	ug TEQ/kg	No Dioxin/Furan Data were collected in the Subsurface								
Mercury	mg/kg	0.224	4.4	--	--	0.99	0.556	--	2	--
Cumulative Hazard/Risk									**3**	**1E-04**

All Intervals										
Chemical	Units	Sediment Exposure Concentration[1]	Fish BSAF[3]	Fraction Organic Carbon (unitless)	Fraction Whole-body Lipid (unitless)	Fish Tissue Concentration	Noncarcinogenic Screeninig Level (HQ=1)	Carcinogenic Screeninig Level (Risk = 1E-06)	Noncarcinogenic Hazard (Unitless)	Carcinogenic Risk (Unitless)
4,4'-DDD[4]	µg/kg	110	0.28	0.042	0.028	21	2780	62.4	0.007	3E-07
4,4'-DDE[4]	µg/kg	5.5	7.7	0.042	0.028	28	2780	44.0	0.01	6E-07
4,4'-DDT[4]	µg/kg	190	1.67	0.042	0.028	212	2780	44.0	0.08	5E-06
Aroclor 1248[4]	µg/kg	500	1.85	0.042	0.028	617	--	7.49	--	8E-05
Aroclor 1254	µg/kg	43.8	1.85	0.042	0.028	54	111	7.49	0.5	7E-06
Aroclor 1260	µg/kg	42.4	1.85	0.042	0.028	52	--	7.49	--	7E-06
Dieldrin	µg/kg	0.92	1.85	0.033	0.028	1.44	278	0.94	0.005	2E-06
TEQs[2,4]	ug TEQ/kg	0.124	0.059	0.042	0.028	4.88E-03	3.89E-03	1.15E-04	1	4E-05
Mercury	mg/kg	0.189	4.4	--	--	0.83	0.556	--	1	--
Cumulative Hazard/Risk									**3**	**1E-04**

Notes:
"--" - Not applicable
BSAF - Biota-Sediment Accumulation Factor
HQ - Hazard Quotient
1. Represented by the 95% upper confidence limit (95% UCL) of the mean (or maximum concentration detected if too few samples for statistical analysis)
2. TEQ - Toxicity equivalency based on 2,3,7,8-tetrachlorodibenzo-para-dioxin (TCDD) (World Health Organization 2005)
3. BSAF - Biota-Sediment Accumulation Factor: Units for mercury (ug/kg tissue ww/ug/kg sediment dw); Units for PCBs (kg sediment organic carbon/kg lipid)
4. Exposure concentration based on the maximum detected concentration. There were insufficient data to calculate a reliable 95% UCL.

Table 6-4
Hazard Quotients for the Benthic Invertebrate Community
General Mills Slip - Superior, WI

Surface										
Chemical	Units	TEC[1]	MEC[2]	PEC[3]	BTV (95/95UTL)[4]	Max	95%UCL[5]	TEC HQ[10]	MEC HQ[11]	PEC HQ[12]
Total DDTr[13]	µg/kg	5.3	289	572	NA	121	121	**23**	0.4	0.2
Total PAHs[6]	µg/kg	1,610	12,205	22,800	7,820	18,000	6,984	**4**	1	0.3
BaP[7]	µg/kg	150	800	1,450	710	500	345	**2**	0.4	0.2
Dibenzofuran	µg/kg	150	365	580	NA	400	161	1	0.4	0.3
Total PCBs[8]	µg/kg	60	368	676	108	41	283.9	**5**	0.8	0.4
Antimony	mg/kg	2	14	25	NA	0.9	0.884	0.4	0.1	0.04
Cadmium	mg/kg	0.99	3.0	5.0	NA	0.7	0.507	0.5	0.2	0.1
Copper	mg/kg	32	91	150	50	70.0	40.1	1	0.4	0.3
Lead	mg/kg	36	83	130	75	33	23.9	0.7	0.3	0.2
Manganese	mg/kg	460	780	1100	1039	1130	711	**2**	0.9	0.6
Mercury	mg/kg	0.18	0.64	1.1	0.59	0.16	0.0802	0.4	0.1	0.07
Nickel	mg/kg	23	36	49	38	32.40	26.6	1	0.7	0.5
Zinc	mg/kg	120	290	460	210	148	113	0.9	0.4	0.2
Tributyltin	µg/kg	0.52	1.73	2.94	210	19	12	**23**	**7**	**4**
TEQ Fish[9]	ng TEQ/kg	0.85	11	22	24	53.9	50.4	**59**	**5**	**2**

Subsurface										
Chemical	Units	TEC[1]	MEC[2]	PEC[3]	BTV (95/95UTL)[4]	Max	95%UCL[5]	TEC HQ[10]	MEC HQ[11]	PEC HQ[12]
Total DDTr[13]	µg/kg	5.3	289	572	NA	271	271	**51**	1	0
Total PAHs[6]	µg/kg	1,610	12,205	22,800	7,820	150,000	25,722	**16**	**2**	1
BaP[7]	µg/kg	150	800	1,450	710	80,000	2212	**15**	**3**	**2**
Dibenzofuran	µg/kg	150	365	580	NA	2,000	388	**3**	1	0.7
Total PCBs[8]	µg/kg	60	368	676	108	650	379	**6**	1	0.6
Antimony	mg/kg	2	14	25	NA	2.2	1.030	0.5	0.08	0.04
Cadmium	mg/kg	0.99	3.0	5.0	NA	1.3	0.623	0.6	0.2	0.1
Copper	mg/kg	32	91	150	50	129	85.8	**3**	0.9	0.6
Lead	mg/kg	36	83	130	75	345	155	**4**	**2**	1
Manganese	mg/kg	460	780	1100	1039	663	338	0.7	0.4	0.3
Mercury	mg/kg	0.18	0.64	1.1	0.59	0.67	0.2240	1	0.4	0.2
Nickel	mg/kg	23	36	49	38	28.50	26.4	1	0.7	0.5
Zinc	mg/kg	120	290	460	210	408	271	**2**	0.9	0.6
Tributyltin	µg/kg	0.52	1.73	2.94	NA	81	19.3	**37**	**11**	**7**
TEQ Fish[9]	ng TEQ/kg	0.85	11	22	24	NA	NA	NA	NA	NA

Table 6-4
Hazard Quotients for the Benthic Invertebrate Community
General Mills Slip - Superior, WI

All Intervals										
Chemical	Units	TEC[1]	MEC[2]	PEC[3]	BTV (95/95UTL)[4]	Max	95%UCL[5]	TEC HQ[10]	MEC HQ[11]	PEC HQ[12]
Total DDTr[13]	µg/kg	5.3	289	572	NA	271	270	**51**	0.9	0.5
Total PAHs[6]	µg/kg	1,610	12,205	22,800	7,820	150,000	22,725	**14**	**2**	1
BaP[7]	µg/kg	150	800	1,450	710	8,000	2900	**19**	**4**	**2**
Dibenzofuran	µg/kg	150	365	580	NA	2,000	342	**2**	0.9	0.6
Total PCBs[8]	µg/kg	60	368	676	108	650	181.0	**3**	0.5	0.3
Antimony	mg/kg	2	14	25	NA	2.2	0.884	0.4	0.1	0.04
Cadmium	mg/kg	0.99	3.0	5.0	NA	1.3	0.586	0.6	0.2	0.1
Copper	mg/kg	32	91	150	50	129	43.5	1	0.5	0.3
Lead	mg/kg	36	83	130	75	345	55.6	**2**	0.7	0.4
Manganese	mg/kg	460	780	1100	1039	1130	428	0.9	0.5	0.4
Mercury	mg/kg	0.18	0.64	1.1	0.59	0.67	0.189	1	0.3	0.2
Nickel	mg/kg	23	36	49	38	32.40	20.4	0.9	0.6	0.4
Zinc	mg/kg	120	290	460	210	408	142	1	0.5	0.3
Tributyltin	µg/kg	0.52	1.73	2.94	NA	81	15.3	**29**	**9**	**5**
TEQ Fish[9]	ng TEQ/kg	0.85	11	22	24	55.9	50.4	**59**	**5**	**2**

Notes:
NA - Not available
Shaded cells indicate an HQ greater than 1.
1.TEC - threshold effect concentration
2.MEC - midpoint effect concentration
3.PEC - probable effect concentration
4.BTV (95/95UTL) - background threshold value for St. Louis River AOC sediments using 95/95 upper tolerance limit
5.95%UCL - 95% upper confidence limit of the mean, a representation of the exposure point concentration
6.Total PAHs - total polycyclic aromatic hydrocarbons based on sum of 18 PAHs calculated using 1/2 reporting limit for nondetects.
7.BaP - benzo(a)pyrene
8.Total PCBs - total polychlorinated biphenyls, calculated as the sum of Aroclors 1248, 1254 and 1260.
9.TEQ Fish - 2,3,7,8-dioxin toxicity equivalency quotient based on Van den Burg (1998)
10. TEC Hazard Quotient (unitless)
11. MEC Hazard Quotient (unitless)
12. PEC Hazard Quotient (unitless)
13. Sum of DDD, DDE and DDT

Table 6-5
Hazard Quotients for the Fish Community
General Mills Slip - Superior, WI

Surface										
Chemical	Units	Sediment Concentration (95% UCL)[1,2] (ug/kg)	BSAF	Fraction Organic Carbon (unitless)	Fraction Whole-body Lipid (unitless)	Fish Tissue Concentration	TRV_{NOAEL}[5]	TRV_{LOAEL}[6]	HQ_{NOAEL}[7] (unitless)	HQ_{LOAEL}[8] (unitless)
Mercury	µg/kg	0.0802	4.4	--	--	0.353	0.3	1	1	0.4
4,4'-DDD[2]	µg/kg	110	0.28	0.050	0.050	30.8				
4,4'-DDE[2]	µg/kg	5.5	7.7	0.050	0.050	42.4				
4,4'-DDT[2]	µg/kg	11	1.67	0.050	0.050	18.4				
Total DDTr[9]	µg/kg					91.5	290	890	0.3	0.1
Dieldrin		Dieldrin was not detected in the surface interval								
Total PCBs[3]	µg/kg	28.9	1.85	0.050	0.050	53.5	5250	13700	0.01	0.004
TEQ Fish[2,4]	ug TEQ/kg	0.0504	0.059	0.050	0.050	0.00297	0.1	0.435	0.03	0.01

Subsurface										
Chemical	Units	Sediment Concentration (95% UCL)[1,2] (ug/kg)	BSAF	Fraction Organic Carbon (unitless)	Fraction Whole-body Lipid (unitless)	Fish Tissue Concentration (ug/kg PCBs)	TRV_{NOAEL}[5]	TRV_{LOAEL}[6]	HQ_{NOAEL}[7] (unitless)	HQ_{LOAEL}[8] (unitless)
Mercury	µg/kg	0.224	4.4	--	--	0.986	0.3	1	3	1
4,4'-DDD[2]	µg/kg	81	0.28	0.033	0.050	34.4				
4,4'-DDE[2]	µg/kg	1.4	7.7	0.033	0.050	16.3				
4,4'-DDT[2]	µg/kg	190	1.67	0.033	0.050	481				
Total DDTr[9]	µg/kg					531	290	890	2	0.6
Dieldrin	µg/kg	0.92	1.85	0.033	0.050	1.12	200	NA	0.006	NA
Total PCBs[3]	µg/kg	299	1.85	0.033	0.050	365	5250	13700	0.1	0.03
TEQ Fish[2,4]	ug TEQ/kg	Dioxins/Furans were not analyzed in the subsurface								

Table 6-5
Hazard Quotients for the Fish Community
General Mills Slip - Superior, WI

All Intervals										
Chemical	Units	Sediment Concentration (95% UCL)[1,2] (ug/kg)	BSAF[10]	Fraction Organic Carbon (unitless)	Fraction Whole-body Lipid (unitless)	Fish Tissue Concentration (ug/kg PCBs)	TRV_{NOAEL}[5]	TRV_{LOAEL}[6]	HQ_{NOAEL}[7] (unitless)	HQ_{LOAEL}[8] (unitless)
Mercury	µg/kg	0.189	4.4	--	--	0.83	0.3	1	3	0.8
4,4'-DDD[2]	µg/kg	110	0.28	0.042	0.050	36.7				
4,4'-DDE[2]	µg/kg	5.5	7.7	0.042	0.050	50.4				
4,4'-DDT[2]	µg/kg	11	1.67	0.042	0.050	21.9				
Total DDTr[9]	µg/kg					109	290	890	0.4	0.1
Dieldrin	µg/kg	0.92	1.85	0.033	0.050	1.12	200	NA	0.006	NA
Total PCBs[3]	µg/kg	180	1.85	0.042	0.050	280	5250	13700	0.05	0.02
TEQ Fish[2,4]	ug TEQ/kg	0.0504	0.059	0.042	0.05	0.00250	0.1	0.435	0.02	0.01

Notes:
NA - Not available
Shaded cells indicate an HQ greater than 1.
1. 95% UCL - 95% upper confidence limit of the mean, a representation of the exposure point concentration
2. Sediment concentration represented by the maximum, as insuffcient samples to calculate a 95% UCL.
3. Total PCBs - total polychlorinated biphenyls, calculated as the sum of Aroclors 1248, 1254 and 1260.
4. TEQ Fish - 2,3,7,8-dioxin toxicity equivalency for fish based on Van den Burg (1998)
5. Toxicity reference value based on the no-observed-adverse-effect level
6. Toxicity reference value based on the lowest-observed-adverse-effect level
7. Hazard quotient based on the no-observed-adverse-effect level
8. Hazard quotient based on the lowest-observed-adverse-effect level
9. Sum of DDE, DDD and DDT
10. BSAF - Biota-Sediment Accumulation Factor: Units for mercury (ug/kg tissue ww/ug/kg sediment dw); Units for PCBs (kg sediment organic carbon/kg lipid)

Table 6-6
Hazard Quotients for Birds
General Mills Slip - Superior, WI

Surface						
Chemical	Units	Sediment Concentration (95% UCL)[1,2] (ug/kg)	TRV_{NOAEL}	TRV_{LOAEL}	HQ_{NOAEL} (unitless)	HQ_{LOAEL} (unitless)
Mercury	mg/kg	0.0802	0.017	0.17	**4.7**	0.5
4,4'-DDD[2]	µg/kg	110	8.2	42	**13**	**3**
4,4'-DDE[2]	µg/kg	5.5	140	710	0.04	0.008
4,4'-DDT[2]	µg/kg	11	470	1300	0.02	0.008
Total DDTr (∑HQ)[5]	µg/kg				**13**	**3**
Dieldrin	µg/kg	Aroclor 1248 was not detected in surface sediments				
Aroclor 1248	µg/kg	Aroclor 1248 was not detected in surface sediments				
Aroclor 1254	µg/kg	22.1	53	530	0.4	0.04
Aroclor 1260	µg/kg	33	1100	1600	0.03	0.02
Total PCBs (∑HQ)[3]	µg/kg				0.4	0.06
TEQ Birds[2,4]	ug TEQ/kg	0.0527	0.33	2.2	0.2	0.02

Subsurface						
Chemical	Units	Sediment Concentration (95% UCL)[1,2] (ug/kg)	TRV_{NOAEL}[6]	TRV_{LOAEL}[7]	HQ_{NOAEL}[8] (unitless)	HQ_{LOAEL}[9] (unitless)
Mercury	mg/kg	0.224	0.017	0.17	**13.2**	1
4,4'-DDD[2]	µg/kg	81	8.2	42	**10**	**2**
4,4'-DDE[2]	µg/kg	1.4	140	710	0.01	0.002
4,4'-DDT[2]	µg/kg	190	470	1300	0.4	0.1
Total DDTr (∑HQ)[5]	µg/kg				**10**	**2**
Dieldrin	µg/kg	0.92	15	820	0.06	0.001
Aroclor 1248[2]	µg/kg	500	53	530	**9**	1
Aroclor 1254	µg/kg	53.3	53	530	1.0	0.1
Aroclor 1260	µg/kg	50.2	1100	1600	0.05	0.03
Total PCBs (∑HQ)[3]	µg/kg				**10**	1
TEQ Birds	ug TEQ/kg	Not analyzed in the subsurface				

All Intervals						
Chemical	Units	Sediment Concentration (95% UCL)[1,2] (ug/kg)	TRV_{NOAEL}	TRV_{LOAEL}	HQ_{NOAEL} (unitless)	HQ_{LOAEL} (unitless)
Mercury	mg/kg	0.189	0.017	0.17	**11**	1
4,4'-DDD[2]	µg/kg	110	8.2	42	**13**	**3**
4,4'-DDE[2]	µg/kg	5.5	140	710	0.04	0.008
4,4'-DDT[2]	µg/kg	190	470	1300	0.40	0.146
Total DDTr (∑HQ)[5]	µg/kg				**14**	**3**
Dieldrin	µg/kg	0.92	15	820	0.06	0.001
Aroclor 1248[4]	µg/kg	500	53	530	**9**	1
Aroclor 1254	µg/kg	43.8	53	530	0.8	0.08
Aroclor 1260	µg/kg	42.4	1100	1600	0.04	0.03
Total PCBs (∑HQ)[3]	µg/kg				**10**	1
TEQ Birds[2,4]	ug TEQ/kg	0.0527	0.33	2.2	0.2	0.02

Notes:
ND - Not detected
Shaded cells indicate an HQ greater than 1.
1. 95% UCL - 95% upper confidence limit of the mean, a representation of the exposure point concentration
2. Sediment concentration represented by the maximum, as insuffiicent samples to calculate a 95% UCL.
3. Total PCBs - total polychlorinated biphenyls, HQ calculated as the sum of Aroclors 1248, 1254 and 1260.
4. TEQ Birds - 2,3,7,8-dioxin toxicity equivalency for fish based on Van den Burg (1998)
3. Total DDTr - HQ calculated as the sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT
6. Toxicity reference value based on the no-observed-adverse-effect level
7. Toxicity reference value based on the lowest-observed-adverse-effect level
8. Hazard quotient based on the no-observed-adverse-effect level
9. Hazard quotient based on the lowest-observed-adverse-effect level

Appendix A Photo Log

AECOM

PHOTOGRAPHIC LOG

Client Name: Wisconsin Department of Natural Resources	Site Location: General Mills - Superior, WI	**BRRTS No.** 07-16-585325

Photo No. **1** | **Date:** 7/27/22

Direction Photo Taken:

NA

Description:

2022-GT-GM-01 (0-2 ft)

Geotechnical Sample

Photo No. **2** | **Date:** 7/27/22

Direction Photo Taken:

NA

Description:

2022-GT-GM-01

Surface water parameters

AECOM

PHOTOGRAPHIC LOG

Client Name: Wisconsin Department of Natural Resources	Site Location: General Mills - Superior, WI	**BRRTS No.** 07-16-585325

Photo No. 3

Date: 7/27/22

Direction Photo Taken:

NA

Description:

2022-GT-GM-02 (0-3 ft)

Geotechnical Sample

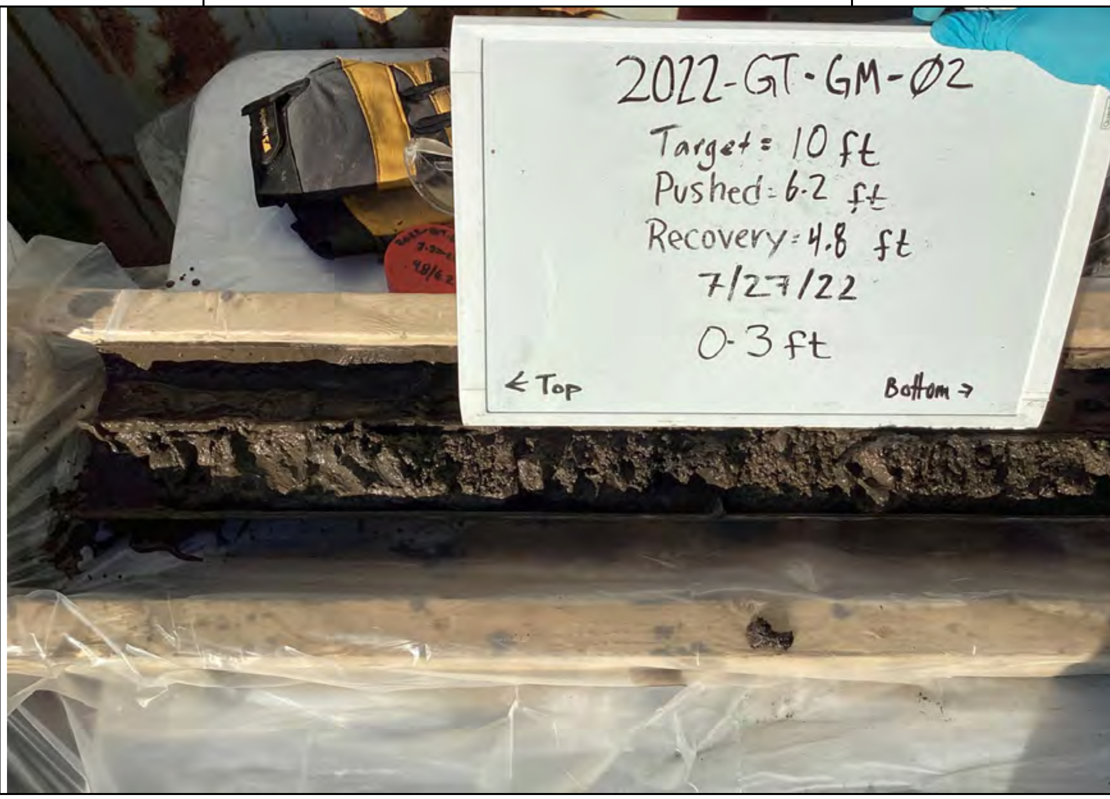

Photo No. 4

Date: 7/27/22

Direction Photo Taken:

NA

Description:

2022-GT-GM-02

Surface water parameters

Appendix B Lithographic Core Logs

BORING NUMBER 2022-GT-GM-01

AECOM

TOTAL DEPTH 10 FT BGS
PAGE 1 OF 1

CLIENT Wisconsin Department of Natural Resources		**PROJECT NAME** Superior Slips WDNR	
PROJECT NUMBER 60685299		**SITE NAME** General Mills Slip	
DATE STARTED 07/27/2022	**COMPLETED** 07/27/2022	**SURVEYING BY** Affiliated Researchers	
DRILLING CONTRACTOR Affiliated Researchers		**ON** 7/27/2022	**GROUND ELEVATION** 585.21 ft
DRILLING EQUIPMENT Russfelder P3		**EASTING** 145550.74	**NORTHING** 312587.13
DRILLING METHOD Vibracore		**HOLE DIAMETER** 0.25 ft	
LOGGED BY KinnardH	**CHECKED BY** KD/AB	**CASING TYPE** N/A	

DEPTH (ft)	SAMPLE ID	RECOVERY %	PID (ppm)	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (ft msl)
0			0		0.00 Organic soil with SAND (OL), 5-15% very fine sand, <10% angular, fine gravel, coal and roots - brown, wet - no odor, no staining - cohesive, very soft	585.2
1			0			
2			0			
3			0			
4	2022-GT-GM-01 (4-5.3)		0		4.00 Silty SAND (SM), very fine, well-graded, 25-35% silt - light brown, moist - no odor, no staining - non-cohesive, very dense	581.2
5		60	0			
6			0			
7					7.50 Silty SAND (SM), very fine, well-graded, 25-35% silt. light brown, moist.	577.7
8						
9						
10						

Refusal at 10.0 feet.
Bottom of borehole at 10 feet.

BORING NUMBER 2022-GT-GM-02

AECOM

TOTAL DEPTH 6.2 FT BGS

CLIENT Wisconsin Department of Natural Resources		**PROJECT NAME** Superior Slips WDNR	
PROJECT NUMBER 60685299		**SITE NAME** General Mills Slip	
DATE STARTED 07/27/2022	**COMPLETED** 07/27/2022	**SURVEYING BY** Affiliated Researchers	
DRILLING CONTRACTOR Affiliated Researchers		**ON** 7/27/2022	**GROUND ELEVATION** 574.18 ft
DRILLING EQUIPMENT Russfelder P3		**EASTING** 145548.87	**NORTHING** 313279.85
DRILLING METHOD Vibracore		**HOLE DIAMETER** 0.25 ft	
LOGGED BY KinnardH	**CHECKED BY** KD/AB	**CASING TYPE** N/A	

DEPTH (ft)	SAMPLE ID	RECOVERY %	PID (ppm)	GRAPHIC LOG		MATERIAL DESCRIPTION	Elevation (ft msl)
0		77	0		0.00	Organic soil (OL), <10% very fine sand and roots - brown, wet - no odor, no staining - cohesive, very soft	574.2
1			0				
2	2022-GT-GM-02 (2-3.5)		0		2.50	- increased sand content (15%), becoming soft at 2.5 ft	571.7
3			0				
4			0				
5	2022-GT-GM-02 (5-6)		0		5.00	Silty SAND (SM), very fine, well-graded, 25-35% silt - light brown, moist - no odor, no staining - non-cohesive, very dense	569.2
6							

Refusal at 6.2 feet.
Bottom of borehole at 6.2 feet.

Appendix C Preliminary Engineering Assessment

Preliminary Engineering Assessment Summary Report

General Mills Slip

Wisconsin Department of Natural Resources

Project reference: WDNR Superior Slips ROAR
Project number: 60685299

May 31, 2023

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
Matthew Bloecher, PE Geotechnical Engineer	David Atkins, SE, PE Structural Engineer	Jeremy Thomas, PE Associate	Kim Elias Project Manager

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	November 11, 2022	Draft 90%	Yes	Kim Elias	Proj. Manager
0	May 31, 2023	100% Final	Yes	Kim Elias	Proj. Manager

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Appendices

1. Introduction

1.1 Site Background

The General Mills Slip is an approximate 7-acre inlet off St. Louis Bay located west of Interstate 535 and just northwest of the city of Superior, Wisconsin. The General Mills Slip is immediately east of Midwest Energy Resources Company's (MERC) large coal stockpile at the West Waterfront. The shoreline along the west slip shoreline is sloped with vegetative cover. Submerged below the western portion of the slip lie the ruins of the Great Northern Dock, which was reportedly abandoned in the 1960s and now consists of a remnant field of timber piles with a shallow embayment. East of the slip is the General Mills Terminal SX. The east shoreline consists of a bulkhead wall that changes to sloped shoreline at approximately 1,200 feet south of the slip mouth. The site location and adjacent property owners are presented on Figure C.1.

1.2 Scope of Services

The main objective of the preliminary engineering assessment was to observe existing site shoreline conditions and identify data gaps related to a geotechnical and structural analysis of the existing slip shoreline. For the preliminary engineering assessment, the following scope of services was completed:

- Contact property owners to locate available historical design and construction records for existing wall segments.
- Perform a document review and scanning to archive electronic versions of available construction and design documents obtained from property owners.
- Perform a site visit to view and document the current condition of walls surrounding the slip. Observations made from the site visits were used to compare existing site conditions to available record drawings.
- Conduct a minimum of two (2) vibracores within the slip for geotechnical testing.
- Assess geotechnical test results from collected vibracore samples.
- Prepare a summary report identifying the documents that were received and reviewed as part of the study.

1.3 Summary of Report

This report summarizes: historical documents received and reviewed pertaining to the existing slip shoreline; field observations made during the September 2022 site visit; and data gaps that will require further assessment and field investigation during the preliminary design phase of the overall Superior Slips ROAR project.

2. Historical Site Information

Based on available property records, the following property owners are currently responsible for the shoreline along the General Mills Slip:

East Shoreline

- General Mills Operations, LLC (General Mills)

West Shoreline

- KM Superior Terminals Inc. / Midwest Energy Resources Company (MERC)

As part of the preliminary engineering assessment, the current shoreline property owners were contacted prior to performing the site visits. During the conversations, AECOM requested historical site information pertaining to the existing shorelines. The following sections summarize information that was provided by the property owners.

2.1 East Shoreline - General Mills

Provided information from General Mills included as-built construction drawings for the bulkhead wall rehabilitation dated March 4, 2013. As-built drawings are included in Appendix C.2. It should be noted that boring locations are presented on the as-built drawings, but boring logs were not provided by the property owner at the time of this report. No other subsurface profile information was provided.

According to the as-built drawings, the existing steel sheet pile bulkhead is approximately 1,197 feet long and was constructed in front of a timber boardwalk supported by timber cribbing. Prior to construction of the steel sheet pile wall, the timber boardwalk was razed and the timber cribbing remained in-place. The existing bulkhead was constructed by driving SKZ25 section sheet piles to a termination elevation of 545.8 feet. After installation of the sheet piles, soil anchors were installed along the wall except where existing mooring dolphins and previously installed sheet piles not related to the rehabilitation were located. In general, soil anchors were installed at 9.5-foot intervals using grade 75 #18 (2.25 inch) permanent threaded rods. The soil anchors are installed at two different elevations and angles from horizontal. Starting at the north end of the shoreline near the slip mouth, soil anchors are installed at 35 degrees from horizontal at elevation 604 feet. Beginning at approximately 917 feet along the bulkhead, soil anchors are installed at 10 degrees from horizontal at elevation 608 feet. The soil anchors are connected to a double C12x20.7 waler that is inclined to match the soil anchor installation angle. The waler is connected to the sheet piles by a bolt, washer plate, and beveled bearing seat.

At approximately 463 feet along the bulkhead from the mouth of the slip, a 100-foot section of steel sheet pile wall is connected to an anchor wall (soil anchors were not used). At this location the sheet piles are connected to the anchor wall with horizontal grade 75 #14 rods. For the anchor wall, previously placed XZ98 section sheet piling was used. The anchor rods are connected to the anchor wall with a nut and 1.25 x 14 x 18 inch steel plate. Depth of the anchor wall pile sheets is unknown.

According to the drawings, the top of bulkhead wall elevation varies. From the mouth of the slip to approximately 917 feet south along the bulkhead, the top of wall elevation is 605.8 feet. At 917 feet, the top of wall elevation transitions to 609.8 feet and remains at that elevation until the bulkhead terminus. Lake level presented on the drawings is 601.1 feet IGLD. Maximum dredge depth is not provided on the drawings.

2.2 West Shoreline - Midwest Energy Resources Company

No information related to the existing shoreline along the MERC property was available. After discussions with the property owner, it was stated that the location of as-built construction drawings is unknown.

2.3 2021 Geophysical Survey

EA Engineering, Science, and Technology Inc., PBC (EA) completed a geophysical survey of the General Mills Slip in April through May 2020. Results from the geophysical survey were submitted to the WDNR as a technical memorandum titled "*Geophysical Survey for North End District and Clough Island Sediment Characterization*," dated, June 15, 2021. The geophysical survey completed by EA for the General Mills Slip included bathymetric survey and sub-bottom profiling. Excerpts from the EA report related to the Slip are included in Appendix C.2.

2.4 2022 Remedial Investigation

A limited geotechnical investigation was performed to collect information on the nature and physical characteristics of the General Mills Slip sediments. On July 28, 2022, Affiliated Researched collected two sediment cores for geotechnical analysis using a 25-ft vibracore sampling vessel. The cores were observed for differentiating layers and sediment types.

AECOM collected three geotechnical samples [2022-GT-GM-01(4-5.3'), 2022-GT-GM-02(2-3.5'), and 2022-GT-GM-02(5-6')] for analysis. Samples were analyzed by Pace for moisture content, total organic carbon (TOC), Atterberg limits, bulk density and particle size distribution (PSD). Laboratory methods utilized for each test are as follows:

- Moisture Content (ASTM 2974),
- TOC (elemental NC soil analyzer),
- Atterberg Limits (ASTM D4318),
- Bulk Density (ASTM D7263), and
- PSD (USCS) (ASTM D422 and ASTM D2487).

The targeted sample depth was 10-ft below the sediment surface. Refusal at locations 2022-GT-GM-01 and 2022-GT-GM-02 occurred at 10 ft and 6.2 ft, respectively. One sample was collected at 2022-GT-GM-01 from 4 to 5.3-ft bgs; two samples were collected at 2022GTGM02 from 2 to 3.5-ft bgs and 5 to 6-ft bgs. Sample collection depths were determined based on lithology observed in the field.

A map of the geotechnical sample locations is provided as Figure C.2. Boring logs and laboratory results are included in Appendix C.3.

It should be noted that additional sediment cores and geophysical work has been completed by others at the site for remediation purposes. Although the information collected does not pertain to geotechnical parameters of soil for use in engineering analysis, the information may be useful for subsurface profile. Historical results from remediation sediment cores are not included in this summary report. For the additional information and core logs, please refer to the "*Remedial Investigation Report - General Mills Slip, AECOM Project number: 60685299*." Historical sediment sampling locations completed in the General Mills Slip are shown in Figure C.3.

3. Site Observations

AECOM performed a water-based visual inspection of the existing shoreline of the General Mills Slip on September 27 and 28, 2022. A land-based inspection was not performed. The main objective of the visual inspection was to collect photographs of existing conditions and check if as-built documents match existing site conditions. The following sections describe what was observed during the site visit. A summary of observations for the bulkhead is presented in Table C.1. A photographic log referenced in the following sections is included as Appendix C.1.

3.1 East Shoreline Observations

In general, the steel sheet pile bulkhead along the east shoreline appeared to be in good condition. The exposed structural elements, waler connection bolts, steel sheet piles, and steel cap didn't show any signs of significant degradation or non-typical corrosion (Photos 1 through 12). No sinkholes or settlement were noticed behind the bulkhead wall during the site visit. In general, the layout of the steel sheet pile wall and section size matched the drawings. Location of the waler connection bolts concurred with the measurements on the drawings. One thing noted is that the sheet piles were coated with a paint layer, presumably for corrosion protection. The paint was generally in good condition above the water line. At the water line, the paint was chipped and eroded away. Conditions below the water line are unknown.

At the end of the steel sheet pile bulkhead, a timber catwalk that was connected to the razed boardwalk was present (Photo 13). The catwalk was approximately 20 feet west of and ran parallel to the existing shoreline (Photo 14). The existing shoreline along this section had rip rap and was vegetated. Slope angle was not verified during the site visit.

3.2 West Shoreline Observations

The length of shoreline along the west slip during the site visit is approximately 660 feet. A close inspection of the slopes was not possible due to the remnant timber piles that were exposed above the water line (Photos 16 and 17). In general, the slopes along the west shoreline were vegetated and had relatively low slope angle.

In addition to the west shoreline, observations of the south shoreline were noted (Photo 15). Based on the observations, the south shoreline has a greater slope angle relative to the west shoreline slopes.

4. Summary and Conclusions

The following sections describe additional information needed to perform a geotechnical and structural analysis of the existing bulkhead walls for anticipated remediation activities. Recommendations for filling data gaps are also provided.

4.1 East Shoreline - Summary

The following historical information is available:

- 2013 As-Built Drawings
- 2021 EA Geophysics Survey
  - Bathymetric Survey
  - Sub-Bottom Profiling

Based on the recent site observations and historical information obtained thus far, the following data gaps would need to be addressed to complete a geotechnical and structural analysis of the existing east bulkhead wall:

1. Subsurface Profile
2. Topographic Survey

As-built drawings for the bulkhead indicate that the site subsurface conditions consist of two geotechnical layers: an upper layer of soft silty, clayey sand to elevation 586; and a lower layer of medium to dense sandy silt and silty clay to elevation 564. The as-built drawings indicate the locations of borings, but no information pertaining to what was encountered in the borings is provided. If the owner can provide a geotechnical report or boring logs for the locations presented in the as-built drawings, the soil profile could be confirmed based on what is stated in the as-built drawings. If historical soil borings are not available, geotechnical borings should be completed to confirm site conditions. If possible, geotechnical soil borings should also be performed within the General Mills Slip. Although not recommended without the aforementioned soil borings, an analysis of the bulkhead wall could be completed based on the profile described in the as-built drawings. Geotechnical soil borings should be completed along the south shoreline adjacent to the timber catwalk to confirm subsurface conditions for slope stability analysis, assuming dredging will occur at this location.

A topographic survey of the existing shoreline conditions should be completed to confirm the profile matches the provided as-built drawings. During the topographic survey, a qualified engineer should perform a site walk to confirm observations are the same as described in this summary report and document any site changes since the September 2022 site visit.

4.2 West Shoreline - Summary

The following historical information is available:

- 2021 EA Geophysics Survey
  - Bathymetric Survey
  - Sub-Bottom Profiling

Based on recent site observations and historical information obtained thus far, the following data gaps would need to be addressed to complete a geotechnical stability analysis of the existing shoreline:

1. Subsurface Profile
2. Topographic Survey

During the coordination phase, the property contact was not aware of any soil boring data that had been collected at the site. For the west shoreline, a global stability analysis should be considered for proposed conditions. Geotechnical soil borings should be completed along the south and west shorelines to obtain subsurface data for slope stability analysis.

A topographic survey of the existing shoreline conditions should be completed. During the topographic survey, a qualified engineer should perform a site walk to confirm observations are the same as described in this summary report and document any site changes since the September 2022 site visit. The survey should be completed before mobilization for the geotechnical soil borings. Results from the topographic survey should be used to confirm which areas of shoreline are of concern and confirm need for global stability analysis.

5. General Qualifications

This report has been prepared in general accordance with normally accepted geotechnical engineering practices to aid in the evaluation of this site and to assist our Client in the design of this project. We have prepared this report for the purpose intended by our Client, and reliance on its contents by anyone other than our Client is done at the sole risk of the user. No other warranty, either expressed or implied, is made. The scope is limited to the specific project and location described herein, and our description of the project represents our understanding of the significant aspects relevant to the geotechnical characteristics. In the event that any changes in the design or location of the facilities as outlined in this report are planned, we should be informed so that the changes can be reviewed, and the conclusions of this report modified as necessary in writing by the geotechnical engineer. As a check, we recommend that we be authorized to review the project plans and specifications to confirm that the recommendations contained in this report have been interpreted in accordance with our intent. Without this review, we will not be responsible for the misinterpretation of our data, our analysis, and/or our recommendations, nor how these are incorporated into the final design.

Figures

VICINITY MAP

Legend

- Railroad
- General Mills Slip
- Parcel Owners

Image Source: Douglas County
Image Date: 2022

Parcel data from the City of Superior/Douglas County

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

N

0 150 300 600
Feet

AECOM

Title: **Surrounding Parcel Owners General Mills Slip**

Project: General Mills
PEA Summary Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: --

Project No.:	Date:	Figure:
60685299	11/9/2022	C.1

Path: L:\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\Site Layout Gen Mills.mxd

VICINITY MAP

Legend

- Geotechnical Sample
- Treatability Study Sample
- General Mills Slip

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

N

0 125 250 500
Feet

AECOM

Title: **Sediment Sample Locations 2022 Investigation**

Project: General Mills Slip
PEA Summary Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: --

Project No.:	Date:	Figure:
60685299	11/9/2022	C.2

Path: L:\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\Sample Location 2022 Map Gen Mills Slip.mxd

VICINITY MAP

Legend

- 2021 Site Investigation Sediment Sample Locations (EA, 2021)
- 2016 Site Investigation Sediment Sample Locations (EA, 2016)
- General Mills Slip

Image Source: Douglas County
Image Date: 2022

NAD 1983 State Plane Wisconsin North FIPS 4801 Feet

N

0 125 250 500
Feet

AECOM

Title: **Sediment Sample Locations Previous Investigations**

Project: General Mills Slip
PEA Summary Report
Superior, Wisconsin

Client: Wisconsin DNR

File Name: --

Project No.:	Date:	Figure:
60685299	11/9/2022	C.3

Path: L:\DCS\GIS\Projects\Superior\MXD\Gen Mills Slip\Sample Location Map Gen Mills Slip.mxd

Tables

AECOM

TABLE C.1. Bulkhead Wall Observations - General Mills Slip - East Shoreline

Concrete Cap		
	Movement/Rotation	N/A
	Control Joints and Expansion Joints	N/A
	Cracks	N/A
Ground Surface		
	Sinkholes	None visible
	Cracks	None visible.
Steel Sheet Piles		
	Corrosion	Assumed protective paint coating deteriorated at water level. Steel corrosion typical for assumed age of piling.
	Waler	Not visible
	Bolts/Anchor Rods	Bolts for waler connection appear in good condition. Soil anchors not visible.
	Fender	N/A

Appendix C.1

Photographic Log

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Wisconsin Department of Natural Resources	Superior Slips ROAR General Mills Slip, Superior, WI	60685299

Photo No. 1	Date: 09/27/22	
Direction Photo Taken: South		
Description: Photo looking at north shoreline of General Mills property. Shoreline protected with rip rap.		

Photo No. 2	Date: 09/27/22	
Direction Photo Taken: Southeast		
Description: Photo of existing bulkhead along east shoreline of the General Mills Slip. Turning cell located at north end of bulkhead.		

Client Name:	Site Location:	Project No.
Wisconsin Department of Natural Resources	Superior Slips ROAR General Mills Slip, Superior, WI	60685299

Photo No. 3	Date: 09/27/22
Direction Photo Taken: East	
Description: Photo looking at start of steel sheet pile bulkhead near turning cell. Steel plate is location of soil anchor connected to waler behind bulkhead. Bolts exposed at inpan of sheet piles are connected to double C12x20.7 inclined waler. Per drawings, soil anchors were drilled at 35-degree angle from horizontal.	

Photo No. 4	Date: 09/27/22
Direction Photo Taken: East	
Description: Photo looking at mooring dolphin #9. Based on historical drawings, dolphins were constructed prior to steel sheet pile bulkhead construction. No soil anchors or waler connections were constructed at dolphin locations.	

Client Name:	Site Location:	Project No.
Wisconsin Department of Natural Resources	Superior Slips ROAR General Mills Slip, Superior, WI	60685299

Photo No. 5	Date: 09/27/22
Direction Photo Taken: North	
Description: Photo of connection between more recent (cream colored) sheet piles and previously installed sheet piles.	

Photo No. 6	Date: 09/28/22
Direction Photo Taken: East	
Description: Looking at connection where more recent (cream colored) sheet piles were installed near previously placed sheet piles. At this location, sheet piles are connected to an anchor sheet pile wall.	

Client Name: Wisconsin Department of Natural Resources	Site Location: Superior Slips ROAR General Mills Slip, Superior, WI	Project No. 60685299

Photo No. 7	Date: 09/27/22
Direction Photo Taken: East	
Description: Typical steel sheet pile bulkhead condition along east shoreline. Photo shows weep hole in steel wale below waler connection bolts. Protective paint coating is deteriorated at water level.	

Photo No. 8	Date: 09/27/22
Direction Photo Taken: Southeast	
Description: Location where top of bulkhead wall transitions. Per construction drawings top of wall changes from elevation 605.8 to 609.8 feet.	

PHOTOGRAPHIC LOG

Client Name: Wisconsin Department of Natural Resources	Site Location: Superior Slips ROAR General Mills Slip, Superior, WI	Project No. 60685299

Photo No. 9	Date: 09/27/22	
Direction Photo Taken: East		
Description: Photo Looking at change in soil anchor and waler connection elevation. Per drawings, anchor elevation changes from 604 to 608 feet. Distance of 4 feet between waler locations was confirmed during site visit.		

Photo No. 10	Date: 09/27/22	
Direction Photo Taken: East		
Description: Photo of bulkhead configuration at mooring dolphin #2.		

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Wisconsin Department of Natural Resources	Superior Slips ROAR General Mills Slip, Superior, WI	60685299

Photo No.	Date:
11	09/27/22

Direction Photo Taken:
East

Description:
Typical condition of steel bulkhead where top of wall is at higher elevation. Based on provided drawings, soil anchors were installed at a 10-degree angle from horizontal at this location.

Photo No.	Date:
12	09/27/22

Direction Photo Taken:
Southeast

Description:
Looking at east shoreline where 2013 steel sheet pile bulkhead was terminated. Timber catwalk that was connected to the razed boardwalk remains.

Client Name: Wisconsin Department of Natural Resources	Site Location: Superior Slips ROAR General Mills Slip, Superior, WI	Project No. 60685299

Photo No. 13	Date: 09/27/22
Direction Photo Taken: Northeast	
Description: Location where 2013 steel sheet pile bulkhead terminates. Timber catwalk remains at this location.	

Photo No. 14	Date: 09/27/22
Direction Photo Taken: East	
Description: Looking at timber catwalk located along shoreline of General Mills property. Slopes behind boardwalk protected by rip rap. Inspection of shoreline was not completed due to access.	

PHOTOGRAPHIC LOG

Client Name: Wisconsin Department of Natural Resources	**Site Location:** Superior Slips ROAR General Mills Slip, Superior, WI	**Project No.** 60685299

Photo No. 15	**Date:** 09/27/22
Direction Photo Taken: South	
Description: Looking at south shoreline of slip. Slopes are relatively steep when compared to west shoreline.	

Photo No. 16	**Date:** 09/27/22
Direction Photo Taken: West	
Description: Condition of west shoreline during site visit. Slopes relatively flat and vegetated. Remnant timber piles from the Great Northern Dock exposed above water.	

PHOTOGRAPHIC LOG

Client Name: Wisconsin Department of Natural Resources	**Site Location:** Superior Slips ROAR General Mills Slip, Superior, WI	**Project No.** 60685299

Photo No. 17	**Date:** 09/27/22	
Direction Photo Taken: North		
Description: Looking north along General Mills Slip. Timber piling from the Great Northern Dock remains throughout the length of the slip.		

Appendix C.2

Historical Site Documents

GENERAL MILLS
SUPERIOR DOCK REHAB

SUPERIOR, WI

ABBREVIATIONS

A.B ANCHOR BOLT
ADDL ADDITIONAL
ADH ADHESIVE
AGGR AGGREGATE
ALT ALTERNATIVE
ANCH ANCHOR
APPROX APPROXIMATE
ARCH ARCHITECTURAL

BSMT BASEMENT
BP BASE PLATE
BM BEAM
BB BEAM BOND
BTW BETWEEN
B/F BEFORE
B.M. BENCHMARK
BD BOARD
BIT BITUMINOUS
BLDG BUILDING
BLK BLOCK
BLKG BLOCKING
BOT BOTTOM
BFE BOTTOM OF FOOTING ELEVATION
BRG BEARING
BRK BRICK

CANT CANTILEVER
CLK CAULKING
CIP CAST IN PLACE
CEM CEMENT
C.P. CEMENT PLASTER
CT CENTER
CL CENTERLINE
CONC CONCRETE
C.T CERAMIC TILE
CLG CEILING

DL DEAD LOAD
DEMO DEMOLITION
D DEPTH
DET DETAIL
DIAG DIAGONAL
DIA DIAMETER
DIM DIMENSION
DR DOOR
DBL DOUBLE
DN DOWN
DWLS DOWELS
D.T. DRAIN TILE
DWG DRAWING

EA EACH
EF EACH FACE
EF EACH WAY
ELEC ELECTRICAL
EL ELEVATION
ELEV ELEVATOR
ENCL ENCLOSURE
ENT ENTRANCE
EXP EXPANSION
E.J. EXPANSION JOINT
EQ EQUAL
EQ SP EQUALLY SPACED
EQUIP EQUIPMENT
ERECT ERECTION
EST ESTIMATE
EXC EXCAVATE
EX., (E) EXISTING
EXP EXPOSED
EXT EXTERIOR

FFE FINISH FLOOR ELEVATION
FF FAR FACE
FS FAR SIDE
FIN FINISH
FLSH FLASHING
FLR FLOOR
F.D. FLOOR DRAIN
FND FOUNDATION
FR FRAMING
FT FOOT (FEET)
FTG FOOTING

GALV GALVANIZED
GA GAUGE
GC GENERAL CONTRACTOR

GL GLULAM
G.B. GRAB BAR
GR GRADE
GB GRADE BEAM
GYP GYPSUM

H.R. HANDRAIL
HDR HEADER
HD HEADED
HT HEIGHT
HS HIGH STRENGTH
HK HOOK
H.C. HOLLOW CORE
H.M. HOLLOW METAL
H.S. HIGH STRENGTH
HSS HOLLOW STRUCTURAL SECTION
HORIZ HORIZONTAL

IN INCH/INCHES
ID INSIDE DIAMETER
IF INSIDE FACE
INSUL INSULATION
INT INTERIOR
INV INVERT

JT JOINT
JST JOIST
JBE JOIST BEARING ELEVATION
JH JOIST HEAD
K KIP (1000 POUNDS)
KO KNOCK OUT

LAD LADDER
LAM LAMINATE
LG LENGTH, LONG
LT LIGHT
LGS LIGHT GAUGE STEEL
LT WT LIGHT WEIGHT
L LINTEL
LL LIVE LOAD
LOC LOCATION
LLH LONG LEG HORIZONTAL
LLV LONG LEG VERTICAL
LLBB LONG LEG BACK TO BACK
LW LONG WAY
LONG LONGITUDINAL
LVR LOUVER

MH MANHOLE
MFR MANUFACTURER
MAS MASONRY
MCJ MASONRY CONTROL JOINT
M.O. MASONRY OPENING
MATL MATERIAL
MAX MAXIMUM
MECH MECHANICAL
MEMB MEMBRANE
MTL METAL
MEZZ MEZZANINE
MIN MINIMUM
MISC MISCELLANEOUS

NS NEAR SIDE
(N) NEW
NOM NOMINAL
N.F.S. NON-FROST SUSCEPTIBLE
N.I.C. NOT IN CONTRACT
N.T.S. NOT TO SCALE
NO NUMBER

O.C. ON CENTER
O.H. OVERHEAD
OPG OPENING
OPP OPPOSITE
ORIG ORIGINAL
OD OUTSIDE DIMENSION
OF OUTSIDE FACE

P.LAM PLASTIC LAMINATE
PER PERIMETER
PERP PERPENDICULAR
PIL PLASTER
PL PLATE
PLAST PLASTER
PLMB PLUMBING

PLYWD PLYWOOD
PR PAIR
PROP PROPERTY
PUR PURLIN
LB POUND
PT POINT
PVC POLYVINYL CHLORIDE
PT POST-TENSIONED
PSF POUNDS PER SQUARE FOOT
PSI POUNDS PER SQUARE INCH
PC PRE-CAST
PROJ PROJECTION

QR QUARTER
QTY QUANTITY

R RADIUS, REACTION
REC RECESSED
REF REFERENCE
R/W REINFORCED WITH
REQD REQUIRED
RET RETURN
REV REVERSE OR REVISION
R RISER
R.D. ROOF DRAIN
RTU ROOF TOP UNIT
RFG ROOFING
R.O ROUGH OPENING

SAN SANITARY
SCHD SCHDULE
SECT SECTION
SHT SHEET
SLBB SHORT LEG BACK TO BACK
SW SHORT WAY
SIM SIMILAR
SOG SLAB ON GRADE
S.C. SLIP CRITICAL
SP @ SPACED AT
SPA SPACES
SPEC SPECIFICATION
SQ SQUARE
SQ FT SQUARE FEET
S.S STAINLESS STEEL
STD STANDARD
STL STEEL
STL JST STEEL JOIST
STIFF STIFFENER
STOR STORAGE
STR STRINGER
STIR STIRRUPS
STRUC. STRUCTURAL
SUSP SUSPENDED
SYM SYMMETRICAL

TCC TOP OF CONCRETE
TEMP STL TEMPERATURE STEEL
TEX TEXTURE
THRU THROUGH
T&G TONGUE AND GROOVE
T&B TOP & BOTTOM
T.O TOP OF
T.O.C. TOP OF CURB
T.O.F. TOP OF FOOTING
T.O.S. TOP OF STEEL
T.O.W. TOP OF WALL
TL TOTAL LOAD
T. TREAD
TYP TYPICAL
TSP TOP OF STEEL PILE

UTIL UTILITY
U.N.O. UNLESS NOTED OTHERWISE
V.B VAPOR BARRIER
VEN VENEER
VERT VERTICAL
VEST VESTIBULE

WPRF WATERPROOF
WT WEIGHT
W.W.M. WELDED WIRE MESH
W.W.F WELDED WIRE FABRIC
WND WINDOW
W/ WITH
W/O WITHOUT
W WIDTH
WD WOOD
WP WORK POINT

STANDARD SYMBOLS

DETAIL BUBBLE: 1 S101
ELEVATION BUBBLE: 2 S102
SECTION BUBBLE: 3 S103
ELEVATION TAG: TOP OF STEEL 100'-0"
DETAIL TAG: 4 S104 DETAIL TAG SCALE: 1" = 1'-0"
TITLE TAG: TITLE TAG SCALE: 1" = 1'-0"
GRID BUBBLE: 1
REVISION TAG: 2
REVISION CLOUD:
BREAK LINE:
NORTH ARROW: NORTH
KEY NOTE: 1
DEMO NOTE: 2

STANDARD PATTERNS

STRUCTURAL STEEL:
COMPACTED SAND:
DENSE GRADED BASE:
CONCRETE:
RIGID INSUL.:
SELECT CRUSHED MATERIAL:

PROJECT CONTACTS

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SHEET INDEX

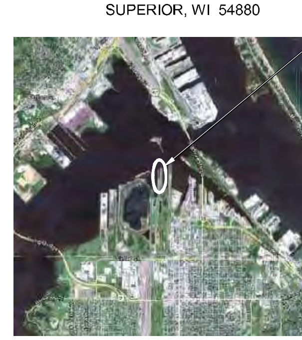
SHEET #	DESCRIPTION	REVISION
T001	TITLE SHEET	
G001	GENERAL STRUCTURAL NOTES	
G101	GENERAL ARRANGEMENT PLAN	
G102	EXISTING CONDITIONS PLANS & NOTES	
G103	TEMPORARY ACCESS PLAN & CONSTRUCTION STAGING PLAN	
D101	DEMOLITION PLANS & NOTES	
D501	DEMOLITION SECTIONS & DETAILS	
D502	DEMOLITION IMAGES	
D503	DEMOLITION IMAGES	
S101	ENLARGED PLAN & SECTIONS	
S102	ENLARGED PLAN & SECTIONS	
S103	ENLARGED PLAN & SECTIONS	
S104	ENLARGED FENDER PLANS	
S105	ACCESS & WALKWAY PLANS	
S106	ACCESS & WALKWAY ENLARGED PLANS	
S107	ACCESS & WALKWAY ENLARGED PLANS	
S501	SECTIONS & DETAILS	
S502	SECTIONS & DETAILS	
S503	SECTIONS & DETAILS	
S504	SECTIONS & DETAILS	

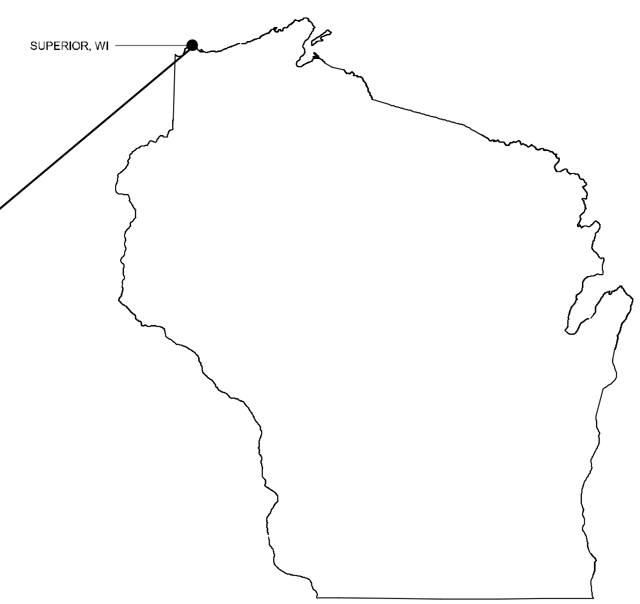
UTILITY INFORMATION

DIGGERS HOTLINE
Toll Free (800) 242-8511
Hearing Impaired TDD (800) 542-2289
www.DiggersHotline.com

PROJECT LOCATION

ADDRESS:
2205 WINTER ST.
SUPERIOR, WI 54880





PROJECT DESCRIPTION

THE PROJECT INVOLVES THE INSTALLATION OF APPROXIMATELY 1,142 FEET OF STEEL SHEET PILE WALL, SOIL ANCHOR TIEBACKS, AND DOCK SURFACE BACKFILL. ALSO INCLUDED IS DEMOLITION OF THE EXISTING WOOD BOARDWALK AND REPLACEMENT OF THE MOORING DOLPHIN ACCESS BY MEANS OF AN OPEN GRATING WALKWAY AND STAIRS. TEMPORARY REMOVAL AND REINSTALLATION OF EXISTING MARINE FENDERS IS REQUIRED TO ALLOW INSTALLATION OF STEEL SHEET PILE WALL AT EXISTING DOLPHINS.

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PROFESSIONAL ENGINEER

Revision Schedule

Date	#	Description	By

GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI
TITLE SHEET

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: WDK/JTF
CHECKED BY: LBL/CIP

SHEET:
T001

3/4/2013 11:58:18 AM
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GENERAL STRUCTURAL NOTES

PROJECT DESCRIPTION:
- THE PROJECT INVOLVES THE INSTALLATION OF APPROXIMATELY 1,142 FEET OF STEEL SHEET PILE WALL, SOIL ANCHOR TIEBACKS, AND DOCK SURFACE BACKFILL. ALSO INCLUDED IS DEMOLITION OF THE EXISTING WOOD BOARDWALK AND REPLACEMENT OF THE MOORING DOLPHIN ACCESS BY MEANS OF AN OPEN GRATING WALKWAY AND STAIRS. TEMPORARY REMOVAL AND REINSTALLATION OF EXISTING MARINE FENDERS IS REQUIRED TO ALLOW INSTALLATION OF STEEL SHEET PILE WALL AT EXISTING DOLPHINS.

DESIGN CRITERIA:
- UNIFORM DOCK SURFACE LOAD: 250 PSF
- MARINE DOLPHIN WALKWAY ACCESS: 40 PSF
- ANNEX WALKWAY ACCESS: 100PSF
- BULKHEAD WALL DESIGN: USACE EM1110-2-2504

WATERBORNE ACCESS:
- THERE IS LIMITED SPACE BETWEEN THE SHIP BERTH, FENDER LINE, AND EXISTING FOUNDATIONS. THE CONTRACTOR SHOULD EXPECT TO STAGE A MAJORITY OF THE WORK FROM BARGES UNTIL THE DOCK FILL SURFACE IS INSTALLED.

COORDINATION WITH PLANT OPERATIONS:
- THE CONTRACTOR IS TO COORDINATE WORK TASKS WITH THE OWNER'S PROJECT ENGINEER TO ENSURE THAT PLANT OPERATIONS, INFRASTRUCTURE, AND SCHEDULES ARE NOT DELAYED OR ADVERSELY AFFECTED BY THE EXECUTION OF THE WORK. THE PROJECT ENGINEER CONTACT IS:

JIM KORSLUND
SR. PROJECT MANAGER
GENERAL MILLS, INC.
OFFICE: 763-764-7920
CELL: 320-260-8911
JIM.KORSLUND@GENMILLS.COM

EXISTING SUBSURFACE CONDITIONS:
- SITE BORINGS INDICATE NATIVE STRATA IS PRIMARILY TWO GEOTECHNICAL GROUPS. AN UPPER LAYER CONSISTING OF SOFT SILTY CLAYEY SAND TO AN ELEVATION OF APPROXIMATELY 586, AND A LOWER LAYER CONSISTING OF MEDIUM TO DENSE SANDY SILT AND SILTY CLAY TO AN ELEVATION OF APPROXIMATELY 564. CARE IS TO BE TAKEN DURING ANCHOR INSTALLATION/GROUTING PROCEDURES AS TO MINIMIZE DISLODGING OF STRATA PARTICLES INTO THE DRILLED HOLE.

SOIL ANCHORS
- THE WORK TO BE PERFORMED UNDER THIS ITEM SHALL CONSIST OF DESIGNING, DRILLING,FURNISHING, INSTALLING, TESTING, AND STRESSING PERMANENT SOIL ANCHORS AT LOCATIONS SHOWN ON THE PLANS.
- SOIL ANCHOR MATERIAL TO BE GRADE 75 PERMANENT THREADED REINFORCING BAR PER SPECIFICATION SECTION 13.8
- WHEN SIZE, LENGTH , OR LOAD CARRYING CAPACITY OF AN ANCHOR IS NOT SHOWN ON THE DRAWINGS, PROVIDE THE SIZE, LENGTH, AND CAPACITY REQUIRED TO CARRY THE DESIGN LOAD TIMES A MINIMUM SAFETY FACTOR OF TWO.
- CONSTRUCTION REQUIREMENTS, ANCHOR TESTING AND STRESSING, AND ACCEPTANCE CRITERIA ARE TO BE PERFORMED PER THE SPECIFICATIONS.
- PROVIDE MULTIPLE CORROSION PREOTECTION SYSTEM ON ANCHORS PER DETAIL 3/G001

FENDER SYSTEM:
- FENDER SYSTEM EXTENSION TO BE INSTALLED ON DOLPHINS 2 THRU 9 AS PER THE CONSTRUCTION DOCUMENTS. EXTENSION OF THE FENDER SYSTEM SHALL NOT AT ANY TIME INTERFERE WITH SHIPPING TRAFFIC AT THE DOCK. STAGING OF THE FENDER EXTENSION MAY BE REQUIRED TO ALLOW PROPER BERTHING AND MOORING DUE TO SHIPPING SCHEDULE. THE OWNER SHALL HAVE FINAL AUTHORITY OVER CONSTRUCTION SCHDULE.
- EXISTING FENDERS TO BE REUSED. SEE PLANS AND DETAILS FOR EXTENSION DIMENSIONS AND NOTES.

CONCRETE/MASONRY ACCESSORIES:
- "ADHESIVE" OR "EPOXY" ANCHORS IN SOLID BASE MATERIAL SHALL BE ASTM A36 THREADED ROD SET IN HILTI RE500 ADHESIVE, OR APPROVED EQUAL. HOLE PREPARATION AND ROD INSTALLATION SHALL BE PER MANUFACTURER RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE 10X(ROD DIA) UNLESS NOTED OTHERWISE.
- CAST-IN-PLACE ANCHORS SHALL BE ASTM A36 THREADED ROD WITH NUT AND WASHER AT EMBEDDED END. MINIMUM EMBEDMENT SHALL BE 8X(ROD DIA) BUT NOT LESS THAN SHOWN ON DRAWINGS, NOR LESS THAN 7 INCHES. ANCHORS SHALL BE AFFIXED TO THE FORM TO PREVENT MOVEMENT DURING POURING, VIBRATION, OR SET-UP AND SHALL NOT BE "STABBED" INTO WET CONCRETE. EMBEDMENT SHALL BE MEASURED FROM FACE OF EMBEDDED WASHER TO SURFACE OF CONCRETE OR CMU. VERIFY ADEQUATE LENGTH OF EXPOSED THREAD TO FULLY ENGAGE ALL ATTACHED WORK.
- ALL CONCRETE OR GROUTED MASONRY MUST CURE FOR A MINIMUM OF 7 DAYS BEFORE ANY HOLES CAN BE DRILLED OR ANY POST-INSTALLED ANCHORS PLACED.
- ALL POST-INSTALLED ANCHORS SHALL BE LOCATED TO AVOID DRILLING INTO REINFORCING, UNLESS SPECIFICALLY APPROVED BY THE ENGINEER. REINFORCING SHALL BE PLACED WITH CONSIDERATION FOR LOCATIONS OF ANCHORS.

REINFORCED CONCRETE:
- MATERIALS:
  - CONCRETE @ 28 DAYS (56 DAYS OK FOR FLY ASH OR SLAG CONCRETE):

APPLICATION	f'c	w/cm	COARSE AGG.	FLY ASH	SLAG	TOTAL FLY ASH + SLAG
	(psi)	(max)	(max)	(% substituted, by mass)		
PIERS AND FTGS	4000	0.42	3/4"	0-25%	20-45%	45% MAX.

- CEMENT: TYPE I OR II PER ASTM C150 (TYPE III OK FOR PRECAST)
- FLY ASH: CLASS F PER ASTM C618
- SLAG: GGBF SLAG PER ASTM C989, GRADE 100 MINIMUM.
- CONCRETE EXPOSED TO WEATHER SHALL HAVE AIR ENTRAINMENT AS FOLLOWS:

COARSE AGG.	AIR CONTENT (+/-1.5%)
3/8"	7.5%
1/2"	7.0%
3/4" - 1"	6.0%

- REINFORCING STEEL: ASTM A615, GRADE 60 TYPICAL (A706 FOR WELDABLE BARS)
- WELDED WIRE FABRIC: ASTM A185
- ALL REINFORCING STEEL LAP SPLICES ARE TO BE CLASS B PER TYPICAL SCHEDULE UNLESS NOTED OTHERWISE.
- HORIZONTAL REINFORCING STEEL IN WALLS AND WALL FOOTINGS SHALL BE CONTINUOUS AROUND CORNERS, SAME SIZE AND SPACING. AT INTERSECTIONS OF WALLS OR FOOTINGS, EXTEND ALL BARS AS FAR AS POSSIBLE INTO CONTINUOUS ELEMENT AND TERMINATE WITH STANDARD HOOK.
- PROVIDE CLEAR COVER FROM OUTERMOST REINFORCING TO SURFACE OF CONCRETE IN ACCORDANCE WITH FOLLOWING SCHEDULE:

EXPOSURE	ELEMENTS	BAR SIZE	CLEAR COVER
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	ALL	ALL	3"
FORMED, EXPOSED TO THE EARTH OR WEATHER	ALL	#6 TO #18	2"
	ALL	#5 OR SMALLER	1-1/2"
NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	SLABS, WALLS, JOISTS	#14, #18	1-1/2"
		#11 OR SMALLER	3/4"
	BEAMS, COLUMNS, (LONGITUDINAL HOOPS, TIES, STIRRUPS, SPIRALS)	ALL	1-1/2"

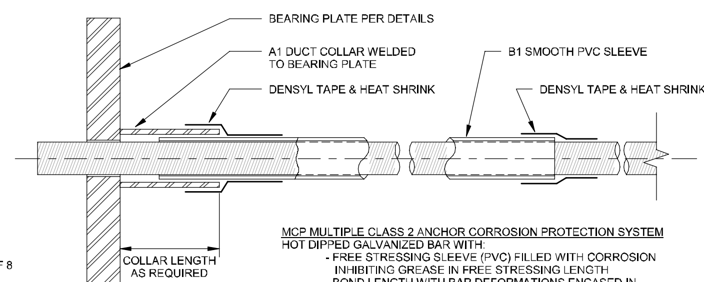
- PROVIDE ALL ACCESSORIES, CHAIRS, SPACER BARS AND SUPPORTS NECESSARY TO SECURE STEEL IN ACCORDANCE WITH ACI CODE OF STANDARD PRACTICE.
- CHAMFER ALL EXPOSED CORNERS AND EDGES ABOVE GRADE.
- DO NOT STRIP FORMS UNTIL CONCRETE HAS REACHED ADEQUATE STRENGTH.
- FURNISH AND PLACE ALL SLEEVES AND OPENINGS AS SHOWN ON THE DRAWINGS OR AS SPECIFIED.
- ALL REINFORCING SHALL BE SHOP FABRICATED, EXCEPT #3 OR #4 BARS MAY BE FIELD BENT. BEND BARS ONLY ONE TIME IN ANY LOCATION, DO NOT REBEND.
- ALL HOOKED BARS SHALL BE A STANDARD ACI SHOP FABRICATED HOOK UNLESS NOTED OTHERWISE.
- ALL CONCRETE WORK SHALL CONFORM TO ACI 301 UNLESS NOTED OTHERWISE.
- TEST CYLINDERS SHALL BE TAKEN ONCE PER DAY OR EVERY 150 C.Y. OF CONCRETE PLACED, FOR EACH MIX USED, IN ACCORDANCE WITH 2006 IBC SECTION 1905.6.
- OBSERVE ALL ACI RECOMMENDATIONS FOR HOT OR COLD WEATHER CONCRETING CURE SLABS USING AN APPROVED CURING COMPOUND OR WET CURE SYSTEM PER ACI RECOMMENDATIONS, WITH SPECIAL CONSIDERATION FOR SLAG AND FLY ASH CONCRETE AS APPROPRIATE.

DRAINAGE ACCESSORIES:
- DRAIN FILTER GEOSYNTHETIC TEXTILE:
  1. APPARENT OPENING SIZE: 70 TO 100 US SIEVE SHEN TESTED IN ACCORDANCE WITH ASTM D 4751.
  2. PERMITTIVITY: 0.5 PER SECOND, MINIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM D 4491.
  3. DURABILITY: COMPLY WITH MINIMUM REQUIRMENTS OF AASHTO M 288 CLASS 1; MINIMUM MASS OF 8 OZ/SQ YARD.
- DRAIN FILL: CLEAN, FREELY DRAINING AGGREGATE. CRUSHED STONE OR COURSE GRAVEL, 3/8"+/- WITH NO MORE THAN 5% PASSING NO. 200 SIEVE.
- DRAIN PIPE: PERFORATED PVC, COMPLYING WITH ASTM D 3034, OR CORRUGATED AND PERFORATED HDPE COMPLYING WITH ASTM F 405.

GENERAL
- CONTRACTOR SHALL ENSURE HIGH STANDARDS OF WORKMANSHIP THROUGHOUT, WITH STRICT ADHERENCE TO THE CONTRACT DOCUMENTS.
- NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES BETWEEN THESE NOTES, THE CONTRACT DRAWINGS, OR THE GOVERNING CODE. THE ENGINEER SHALL REPLY IN WRITING. ANY RELATED WORK PERFORMED BY THE CONTRACTOR PRIOR TO RECEIVING A REPLY FROM THE ENGINEER IS AT THE CONTRACTOR'S SOLE RISK. FOR PURPOSES OF BIDDING, THE MOST STRINGENT OF THE CONFLICTING DOCUMENTS SHALL APPLY.
- VERIFY ALL EXISTING CONDITIONS; VERIFY ALL DIMENSIONS IN THE FIELD; NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR CONDITIONS NOT INCLUDED IN OR CONTRARY TO THE CONTRACT DOCUMENTS PRIOR TO CONSTRUCTION.
- THE STRUCTURE SHOWN IN THESE DRAWINGS IS DESIGNED TO BE STABLE AND TO RESIST LOADS ONLY IN A FULLY COMPLETED FORM. CONTRACTOR SHALL ENSURE THAT THE STRUCTURE IS ADEQUATELY BRACED AND SHORED DURING CONSTRUCTION FOR ALL TEMPORARY LOADS UNTIL ALL ELEMENTS ARE IN PLACE, AND SHALL ENSURE THAT TEMPORARY LOADINGS DO NOT EXCEED THE ALLOWABLE CAPACITY OF ANY STRUCTURAL ELEMENTS BOTH BEFORE AND AFTER THESE ELEMENTS ARE IN PLACE.
- CONTRACTOR IS SOLELY RESPONSIBLE FOR SITE SAFETY, COORDINATION, PROCEDURES, CONSTRUCTION METHODOLOGY, SHORING, BRACING, AND SEQUENCING.
- CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PROTECTION OF EXISTING BUILDINGS, UTILITIES, EQUIPMENT, ETC. DURING CONSTRUCTION. PROVIDE TEMPORARY BRACING AND PROTECTION AS REQUIRED.
- DO NOT SCALE DRAWINGS. SEE STRUCTURAL DRAWINGS FOR DIMENSIONS, AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- ANY HOLES OR OTHER ALTERATIONS TO THE STRUCTURE WHICH ARE NOT SPECIFICALLY DETAILED ON THE CONTRACT DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- THESE DRAWINGS, AND ALL DESIGNS SHOWN WITHIN THESE DRAWINGS, ARE COPYRIGHTED BY KRECH OJARD & ASSOCIATES. DUPLICATION IS NOT PERMITTED WITHOUT WRITTEN PERMISSION. THE DESIGNS SHOWN HEREIN ARE INTENDED FOR THIS PROJECT ONLY AND MAY NOT BE USED ON ANY OTHER PROJECT OR FOR ANY OTHER PURPOSE.

STRUCTURAL STEEL AND MISCELLANEOUS METALS:
- SEE PROJECT SPECIFICATIONS.

STEEL SHEET PILING:
- CONFORM TO WISDOT SPECIFICATION SECTION 512.0
- PROVIDE HIGH PERFORMANCE COATING PER PROJECT SPECIFICATION SECTION 13.6



MCP MULTIPLE CLASS 2 ANCHOR CORROSION PROTECTION SYSTEM
HOT DIPPED GALVANIZED BAR WITH:
- FREE STRESSING SLEEVE (PVC) FILLED WITH CORROSION INHIBITING GREASE IN FREE STRESSING LENGTH
- BOND LENGTH WITH BAR DEFORMATIONS ENCASED IN BOND ZONE GROUT

BAR SIZE	"A1" (nom.) SCH. 40 WELDED DUCT COLLAR USING "B1"	"B1" (nom.) CLASS 200 PVC SMOOTH SLEEVE (GREASED)
#14 (1 3/4" nom.)	3"	2"
#18 (2 1/4" nom.)	3"	2 1/2"

3 / G001 SOIL ANCHOR CORROSION PROTECTION
3" = 1'-0"

CONCRETE REINFORCEMENT TENSION DEVELOPMENT AND LAP SPLICE LENGTHS

BAR SIZE	LAP SPLICE CLASS	CONCRETE COVER = 0.75" TOP	CONCRETE COVER = 0.75" OTHER	CONCRETE COVER = 1.00" TOP	CONCRETE COVER = 1.00" OTHER	CONCRETE COVER = 1.50" TOP	CONCRETE COVER = 1.50" OTHER	CONCRETE COVER = 2.00" TOP	CONCRETE COVER = 2.00" OTHER
#3	A	12	12	12	12	12	12	12	12
	B	16	16	16	16	16	16	16	16
#4	A	19	15	15	12	15	12	15	12
	B	24	19	20	16	20	16	20	16
#5	A	28	21	22	17	19	15	19	15
	B	36	28	29	22	24	19	24	19
#6	A	37	29	31	24	22	17	22	17
	B	48	37	40	31	29	22	29	22
#7	A	60	48	50	38	37	28	33	25
	B	78	60	64	50	48	37	42	33
#8	A	74	57	62	48	47	36	37	29
	B	96	74	80	62	60	47	48	37
#9	A	90	69	76	58	57	44	46	36
	B	117	90	98	76	74	57	60	46
#10	A	108	83	92	70	70	54	57	44
	B	140	108	119	92	91	70	74	57
#11	A	127	98	108	83	84	64	68	53
	B	165	127	141	108	109	84	89	68

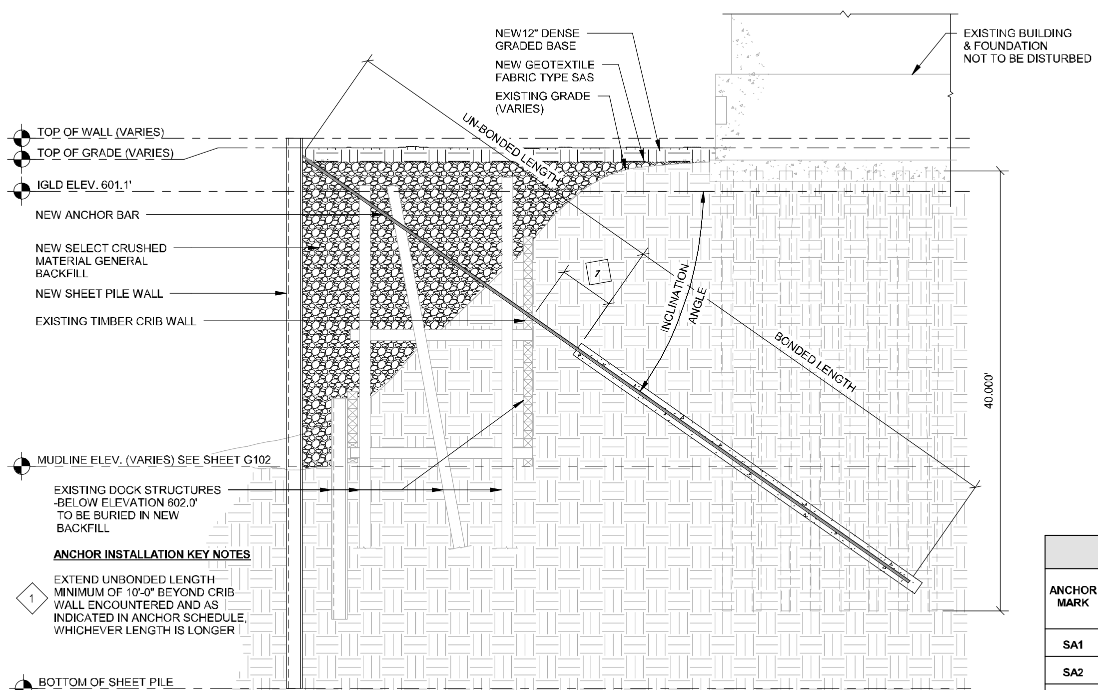
NOTES:
1. TABULATED VALUES ARE BASED ON GRADE 60 UNCOATED REINFORCING BARS AND 4000 PSI NORMAL WEIGHT CONCRETE. LENGTHS ARE IN INCHES.
2. TENSION DEVELOPMENT LENGTH AND LAP SPLICE LENGTHS ARE CALCULATED PER ACI 318-99, SECTIONS 12.2.3 AND 12.15.
3. TENSION DEVELOPMENT LENGTH = 1.0 x CLASS A LAP SPLICE.
4. FOR 3000 PSI AND 5000 PSI CONCRETE, MULTIPLY THE TABULATED VALUES BY 1.16 AND 0.90 RESPECTIVELY.
5. BAR c. - c. SPACING WAS ASSUMED TO BE GREATER THAN TWICE THE CONCRETE COVER PLUS ONE BAR DIAMETER.
6. TOP BARS ARE DEFINED AS HORIZONTAL BARS WITH MORE THAN 12 INCHES OF CONCRETE CAST BELOW THE BARS.
7. FOR LIGHTWEIGHT AGGREGATE CONCRETE, MULTIPLY THE TABULATED VALUES BY 1.3.
8. FOR EPOXY COATED REBAR, MULTIPLY THE TABULATED VALUES BY 1.3.
9. FOR LAP SPLICE LENGTHS IN MASONRY SEE MASONRY NOTES.

MINIMUM SPLICE AND EMBEDMENT LENGTHS [1,2]

CONCRETE STRENGTH = 4000 PSI BAR STRENGTH = 60,000 PSI

Type	Lap Splice		Embedment		
Bar Size	Vertical Bar or Bottom Bar	Horizontal Bar	Vertical Bar or Bottom Bar	Horizontal Bar	Standard Hook
3	19	24	15	19	6
4	25	32	19	25	7
5	31	40	24	31	9
6	37	48	29	37	10
7	54	70	42	54	12
8	62	80	48	62	14
9	70	91	54	70	15

1. TABULATED VALUES ARE BASED ON GRADE 60 REINFORCING BARS AND NORMAL-WEIGHT CONCRETE. THEY ARE TYPICAL MINIMUM VALUES TO BE USED UNLESS NOTED OTHERWISE WITHIN THE PLANS. LENGTHS ARE IN INCHES.
2. BOTTOM HORIZONTAL BARS MUST BE CAST WITHIN THE BOTTOM 12" OF THE CONCRETE POUR
3. LENGTHS ARE FOR C-C BAR SPACING GREATER THAN OR EQUAL TO 2 BAR DIAMETERS AND CLEAR COVER GREATER THAN OR EQUAL TO ONE BAR DIAMETER. INCREASE THE TABULATED VALUES BY 50% FOR ALL OTHER CASES.
4. ALL LAP SPLICES ARE ASSUMED TO BE CLASS B TYPE. TABULATED VALUES MAY BE REDUCED BY 25% FOR ALL CLASS A SPLICES.
5. FOR EPOXY COATED BARS, INCREASE THE TABULATED VALUES BY 20%.
6. FOR LIGHTWEIGHT AGGREGATE CONCRETE, INCREASE THE TABULATED VALUES BY 30%.
7. LENGTHS SHOWN ARE FOR SIDE CONCRETE COVER GREATER THAN OR EQUAL TO 2 1/2" AND END CONCRETE COVER GREATER THAN OR EQUAL TO 2"



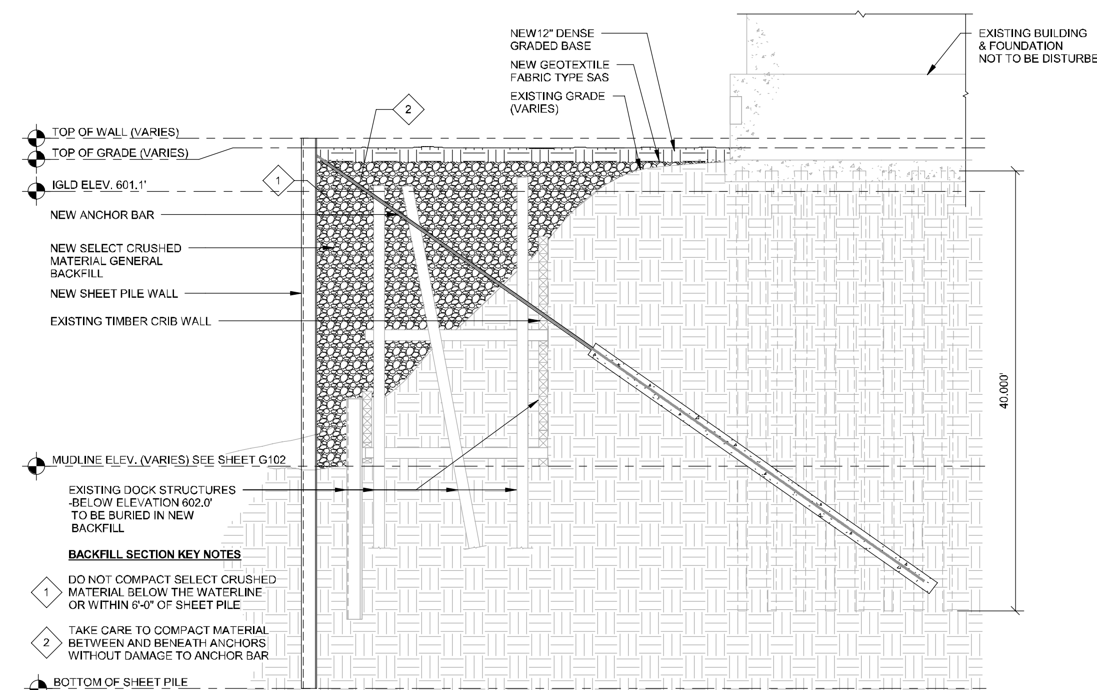
ANCHOR INSTALLATION KEY NOTES
1. EXTEND UNBONDED LENGTH MINIMUM OF 10'-0" BEYOND CRIB WALL ENCOUNTERED AND AS INDICATED IN ANCHOR SCHEDULE, WHICHEVER LENGTH IS LONGER

1 / G001 TYPICAL WALL/SOIL ANCHOR INSTALLATION
1/8" = 1'-0"

SOIL ANCHOR SCHEDULE

ANCHOR MARK	DOWN INCLINATION ANGLE (DEGREES)	MINIMUM UNBONDED LENGTH (FT)	SERVICE LOAD TENSION CAPACITY (KIPS)	COMMENTS
SA1	10	35	124	
SA2	35	35	150	
SA3	35	30	137	

NOTE: ALL SOIL ANCHORS TO BE GRADE 75 #18 (2 1/4") PERMANENT THREADED REINFORCING BAR PER SPECIFICATION SECTIONS 13.5 AND 13.8



BACKFILL SECTION KEY NOTES
1. DO NOT COMPACT SELECT CRUSHED MATERIAL BELOW THE WATERLINE OR WITHIN 6'-0" OF SHEET PILE
2. TAKE CARE TO COMPACT MATERIAL BETWEEN AND BENEATH ANCHORS WITHOUT DAMAGE TO ANCHOR BAR

2 / G001 TYPICAL BACKFILL SECTION
1/8" = 1'-0"

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WISCONSIN LAURAN B. LARSON EAU CLAIRE, WI PROFESSIONAL ENGINEER

Revision Schedule

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GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

GENERAL STRUCTURAL NOTES

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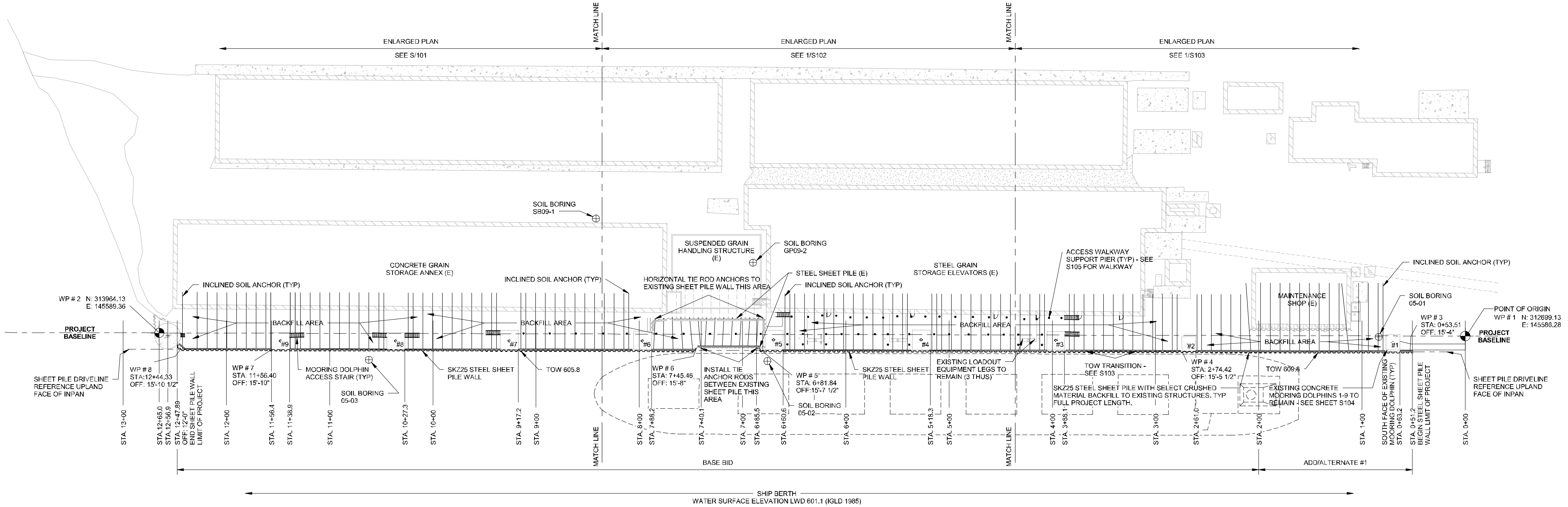

1
G101 GENERAL ARRANGEMENT PLAN
1" = 50'-0"

NORTH

GENERAL ARRANGEMENT NOTES

PROJECT DESCRIPTION:

- THE PROJECT INVOLVES THE INSTALLATION OF APPROXIMATELY 1,142 FEET OF STEEL SHEET PILE WALL, SOIL ANCHOR TIEBACKS, AND DOCK SURFACE BACKFILL. ALSO INCLUDED IS DEMOLITION OF THE EXISTING WOOD BOARDWALK AND REPLACEMENT OF THE MOORING DOLPHIN ACCESS BY MEANS OF AN OPEN GRATING WALKWAY AND STAIRS. TEMPORARY REMOVAL AND REINSTALLATION OF EXISTING MARINE FENDERS IS REQUIRED TO ALLOW INSTALLATION OF STEEL SHEET PILE WALL AT EXISTING DOLPHINS.

HORIZONTAL DIMENSIONAL CONTROL:

- WP #1 AND WP#2 DEFINE THE PROJECT BASELINE.

- WP#4 AND WP#7 DEFINE THE SHEET PILE DRIVELINE REFERENCE BASED ON 3 INCH MINIMUM CLEARANCE BETWEEN THE UPLAND PAN FACE OF NEW STEEL SHEET PILES AND THE OUTSIDE FACE OF EXISTING CONCRETE MOORING DOLPHINS 2, AND 9, RESPECTIVELY. THE CLEARANCE AT ALL OTHER EXISTING CONCRETE DOLPHINS EXCEEDS 3 INCHES. THE DRIVELINE IS DESIGNED TO BE STRAIGHT BETWEEN WP#3 AND WP#8.

- WORK POINTS #5 AND #6 DEFINE THE POINT OF TRANSITION BETWEEN NEW STEEL SHEET PILING AND EXISTING SHEET PILES WITHIN A LOCAL AREA NEAR STA 7+00.

SOIL ANCHORS:

- THE LOWER PORTIONS OF TIEBACK SOIL ANCHORS WILL BE INSTALLED WITHIN SOIL STRATA WHICH MAY ALSO CONTAIN LOWER SECTIONS OF EXISTING PINE TIMBER PILES ESTIMATED AT 12 INCH DIAMETER, 2'-8" APPROXIMATE SPACING. DRILLING THROUGH SOME OF THE WOOD PILES DURING ANCHOR INSTALLATION IS EXPECTED AND ALLOWABLE AS THE REMOVED PORTION WILL BE REPLACED WITH THE HARDENED ANCHOR GROUT.

- THE BASE BID PLANS AND SPECIFICATIONS REFLECT A GROUTED SOIL ANCHOR CONFIGURATION WHICH INCLUDES THE USE OF TEMPORARY DRILL CASING, GRADE 75 THREADED REINFORCING BAR, AND A LIMITATION OF THE DRILLED HOLE DIAMETER WITHIN EXISTING WOOD PILES TO 8 INCHES. ALTERNATE GROUTED SOIL ANCHOR CONFIGURATIONS MAY BE SUBMITTED FOR CONSIDERATION BUT THE BASE BID MUST REFLECT THE TEMPORARY DRILL CASING AND GRADE 75 THREADED REINFORCING BAR CONFIGURATION SHOWN. AN ALTERNATE GROUTED SOIL ANCHOR SYSTEM, IF SUBMITTED, WILL BE REVIEWED BY THE ENGINEER FOR APPROVAL AND ACCEPTANCE ONLY AFTER THE BID OPENING AND AWARD. THE EXISTENCE OF THE PROCESS FOR SUBMISSION AND REVIEW OF ALTERNATE SOIL ANCHOR SYSTEMS DOES NOT IMPLY SUBSEQUENT ACCEPTANCE OF ALTERNATE SYSTEMS.

- THE UPPER STRATA OF GRADE IS EXPECTED TO CONTAIN PORTIONS OF TIMBER CRIBS RANGING FROM 60 TO 100 YEARS IN AGE. THE ANCHOR INSTALLATION CONTRACTOR SHOULD EXPECT TO ENCOUNTER PINE TIMBER CRIB AND CRIB FILL MATERIAL WHICH IS HIGHLY VARIABLE AND WHICH MAY CONTAIN COBBLE SIZE STONES.

EXISTING MOORING FENDERS:

- INSTALLATION OF THE NEW STEEL SHEET PILE STABILIZATION WALL REQUIRES THAT THE EXISTING FENDERS MOUNTED ON (7) MOORING DOLPHINS BE TEMPORARILY REMOVED TO ALLOW CLEARANCE FOR THE SHEET PILE DRIVING PROCESS. THE FENDERS ARE TO BE REINSTALLED AT EACH DOLPHIN, WITH THE ADDITION OF FENDER EXTENSIONS SHOWN ON DETAIL 9/S503, AS SOON AS PRACTICAL AFTER SHEET PILE IS INSTALLED AT EACH DOLPHIN. A SINGLE FENDER ELEMENT IS TO BE REMOVED FROM THE MOORING CELL AT NORTH AND REINSTALLED AT DOLPHIN #2 PER DETAIL 10/S503. REFER TO 14/S503 FOR SHIM CONFIGURATION.

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SUPERIOR, WI

GENERAL ARRANGEMENT PLAN

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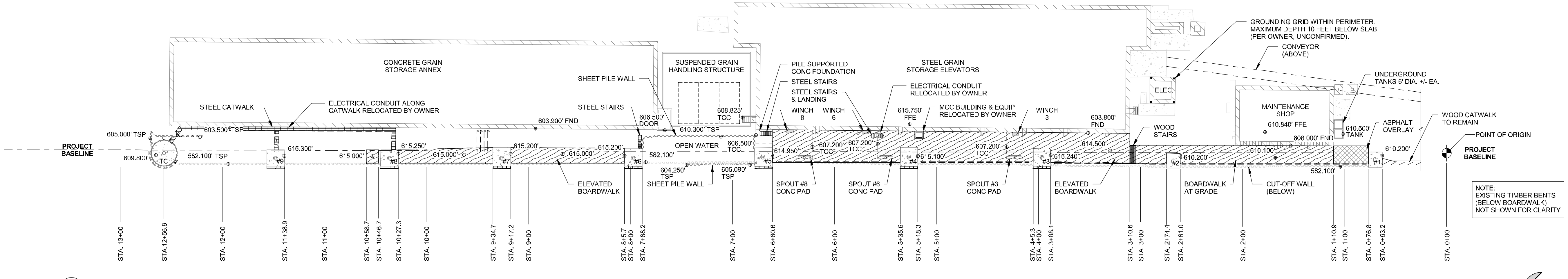
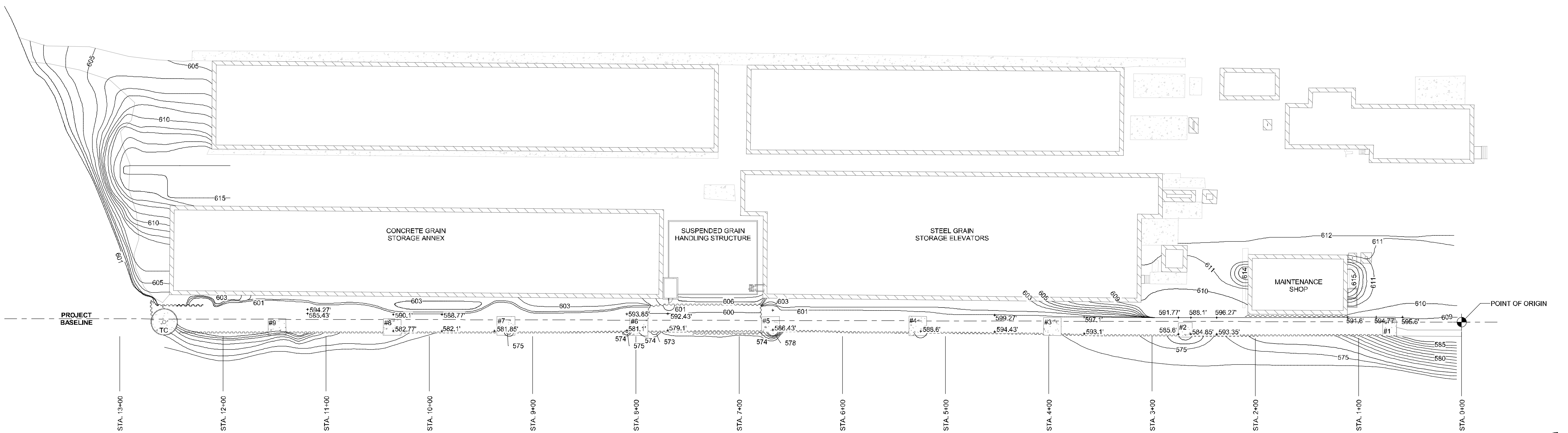


1 EXISTING ELEVATIONS PLAN
G102 1" = 50'-0"



2 EXISTING GRADING PLAN
G102 1" = 50'-0"

NOTE: BATHYMETRY REFLECTS JULY OF 2009. CURRENT CONDITIONS MAY VARY.

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PROFESSIONAL ENGINEER

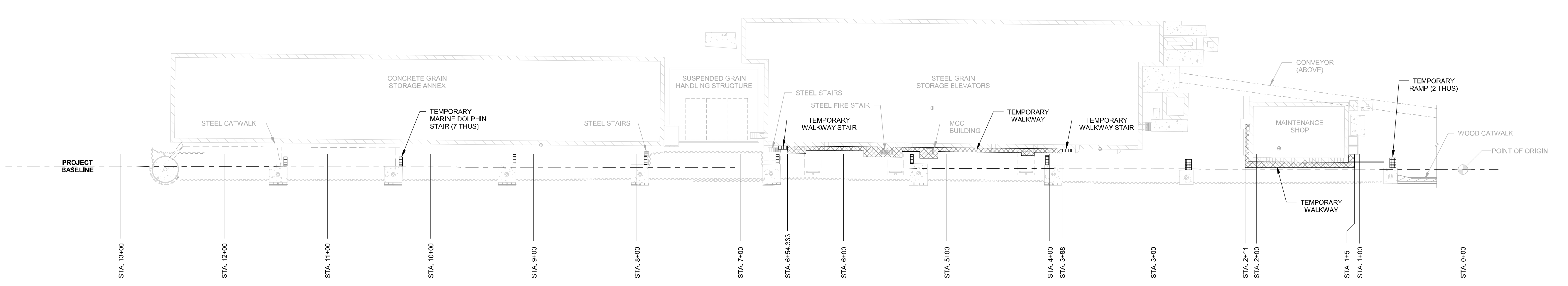
Revision Schedule			
Date	#	Description	By

GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

EXISTING CONDITIONS PLANS & NOTES

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: WDK/JTF
CHECKED BY: LBL/CIP

SHEET:
G102

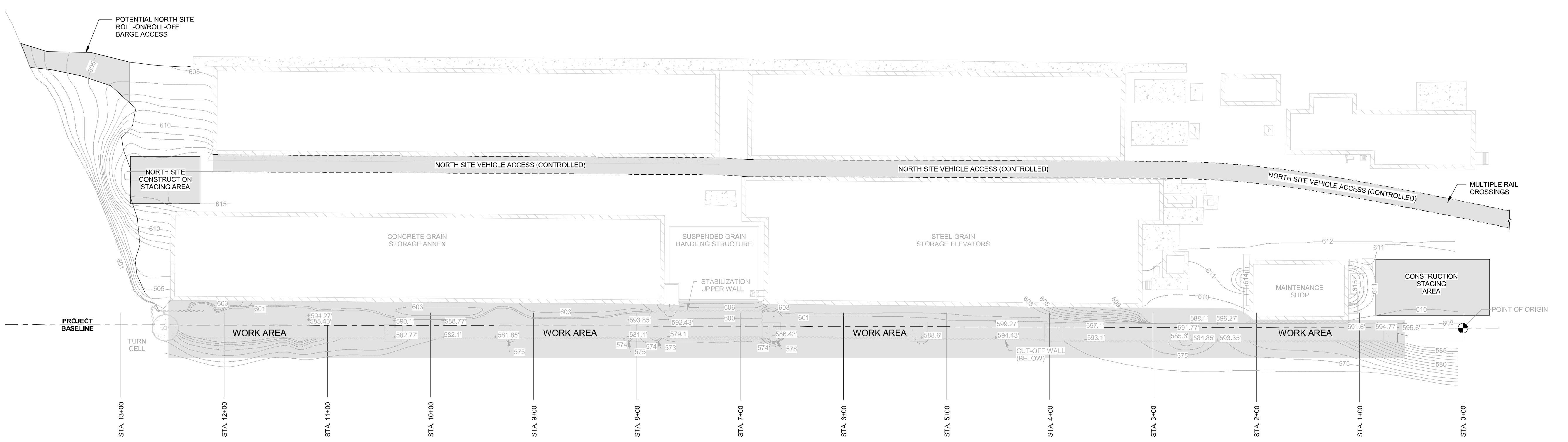


1 OWNER ACCESS PLAN
G103 1" = 50'-0"

NOTES

OWNER ACCESS AND BARRIERS:

1. PROVIDE COVERED WALKWAYS AND BARRIERS AS REQUIRED TO ALLOW OWNER'S STAFF TO ACCESS, EXIT, AND OPERATE THE FACILITY. THE PLANS ILLUSTRATE THE PATHS OF EGRESS AND ACCESS WHICH MUST REMAIN IN CONTINUOUS USE THROUGHOUT THE EXECUTION OF THE WORK. PROVIDE MINIMUM 4 FOOT WIDE TEMPORARY ACCESS WALKWAY AND STAIRS AS REQUIRED, WHERE SHOWN. EXISTING WALKWAYS OR PARTS THEREOF MAY BE INCORPORATED WHOLLY OR IN PART TO FULFILL THE EGRESS AND ACCESS REQUIREMENT. CONFORM TO OSHA STANDARDS FOR TEMPORARY STAIRS, HANDRAILS, AND PEDESTRIAN WALKWAYS.
2. WIDEN TEMPORARY WALKWAY AS REQUIRED TO MAINTAIN 4 FOOT WIDTH AT EXISTING STAIRS AND PROJECTIONS OF EQUIPMENT FROM WALL.
3. PROVIDE TEMPORARY STAIRS TO MARINE DOLPHINS #3 TO #9 AS REQUIRED FOR SHIP LINE HANDLING.
4. PROVIDE TEMPORARY RAMPS TO MARINE DOLPHINS #1 AND #2 AS REQUIRED FOR SHIP LINE HANDLING.
5. PROVIDE TEMPORARY STAIR EXTENSION TO GRADE FOR GRAIN LOADING CONTROL ACCESS STAIR



2 CONSTRUCTION STAGING PLAN
G103 1" = 50'-0"

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Revision Schedule			
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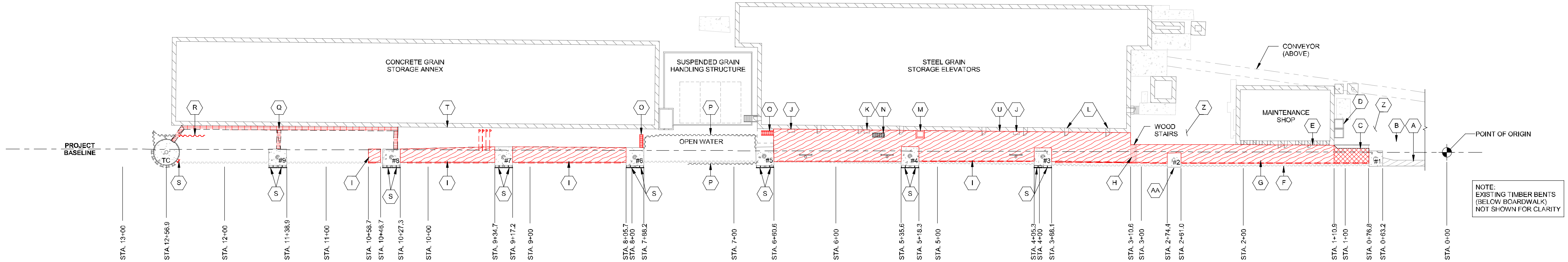
GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

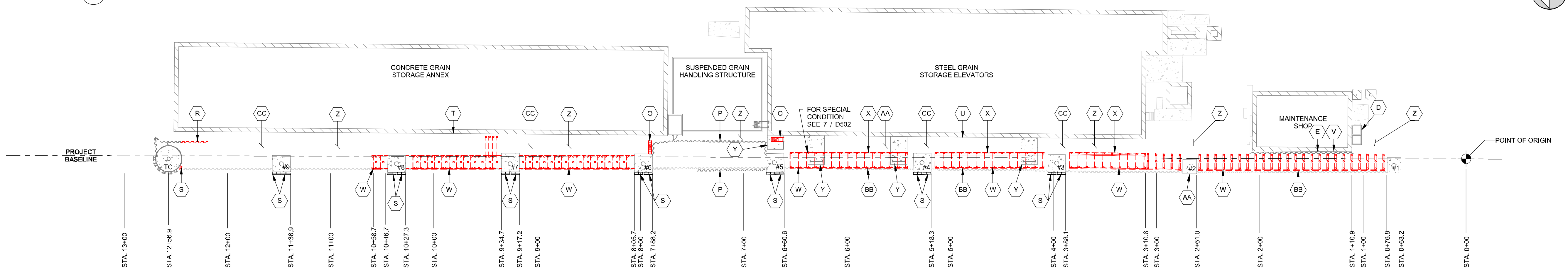
TEMPORARY ACCESS PLAN & CONSTRUCTION STAGING PLAN

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: WDK/JTF
CHECKED BY: LBL/CIP

SHEET:
G103



1 D101 DEMOLITION PLAN @ EL. 615.0' +/-
1" = 50'-0"



6 D101 DEMOLITION PLAN @ EL. 605.0' +/-
1" = 50'-0"

DEMOLITION KEY NOTES

A	NARROW WOOD BOARDWALK TO REMAIN IN PLACE - RIP RAP MAY BE ALLOWED TO BE PLACED ADJACENT TO VERTICAL TIMBER PILES AS NEEDED.
B	EXISTING ASPHALT CURB TO REMAIN IN PLACE - DAMAGE CAUSED TO CURB SHALL BE REPORTED TO THE EOR.
C	ASPHALT OVERLAY TO BE REMOVED ALONG ALIGNMENT AS INDICATED IN DETAIL 5/D501.
D	BURIED SANITARY TANKS TO REMAIN IN PLACE AND UNDISTURBED - CONTRACTOR TO TAKE PRECAUTIONS AS NECESSARY TO PROTECT TANKS FROM MOVEMENT OR DAMAGE.
E	MAINTENANCE BUILDING WALL FOUNDATION TO REMAIN IN PLACE - CARE TO BE TAKEN TO PREVENT UNDERMINING OF EXISTING FOUNDATION ELEMENTS.
F	CUT OFF WALL (BELOW) TO REMAIN IN PLACE
G	BOARDWALK AT GRADE TO BE REMOVED BETWEEN STATIONS 0+76 TO 3+11.
H	WOOD STAIRWAY AND ASSOCIATED HANDRAIL AT TRANSITION TO ELEVATED BOARDWALK TO BE REMOVED.
I	ELEVATED BOARDWALK TO BE REMOVED FROM STATION 3+10 TO 10+28 AS INDICATED ON PLANS. TEMPORARY ACCESS TO BUILDING AND DOLPHINS TO BE PROVIDED PER G103.
J	WINCH TO REMAIN IN PLACE. CARE TO BE TAKEN NOT TO DISTURB WINCH OR CABLES DURING DEMO OPERATIONS
K	WINCH TO BE RELOCATED BY OWNER - SEE 2/S105 FOR NEW LOCATION
L	DOORS TO BE ABANDONED BY OWNER
M	MECHANICAL CONTROL CENTER BUILDING TO BE REMOVED AND RELOCATED BY OWNER.
N	EXTERIOR STAIRWAY TO REMAIN. TEMPORARY SUPPORT TO BE PROVIDED AS NEEDED FOR TEMPORARY ACCESS DURING CONSTRUCTION PHASE.
O	STEEL ACCESS STAIRWAY TO BE REMOVED. STAIR MAY BE USED FOR TEMPORARY ACCESS DURING CONSTRUCTION PHASE PER TEMPORARY ACCESS PLAN ON G103.
P	SHEET PILE WALL TO REMAIN IN PLACE. CARE TO BE TAKEN NOT TO DISTURB OR DAMAGE WALL.
Q	CATWALK TO BE REMOVED AND REUSED. SEE 2/S105 FOR REPURPOSING. CARE TO BE TAKEN NOT TO DAMAGE CONCRETE OF ANNEX DURING REMOVAL OF WALKWAY.
R	STEEL SHEET PILE TO BE REMOVED TO ALLOW INSTALLATION OF ANCHORS. SEE 3/S101 FOR LOCATION OF ANCHOR CLOSEST TO TURNING CELL. SHEETS ARE APPROXIMATELY 30FT LONG.
S	FENDER TO BE REMOVED AND REUSED. CARE TO BE TAKEN NOT TO DAMAGE FENDER RUBBER, STEEL SHEET OF TURNING CELL, OR INSERT OF CONCRETE DOLPHINS. SEE 14/S503 FOR FINAL ARRANGEMENT.
T	CONCRETE GRAIN STORAGE ANNEX FOUNDATION NOT TO BE DISTURBED.
U	STEEL GRAIN STORAGE ELEVATOR FOUNDATION NOT TO BE DISTURBED.
V	STEEL SHEET PILE WALL TO REMAIN IN PLACE. SEE 2/S103 FOR NOTES ON PLACEMENT OF NEW ANCHORAGE THROUGH SHEETS.
W	TIMBER BENTS TO BE REMOVED. ALL CROSS BRACING ABOVE EXISTING WATERLINE TO BE REMOVED. VERTICAL TIMBER PILES TO BE CUT AND REMOVED ABOVE ELEVATION 602.
X	TIMBER CRIB ABOVE WATERLINE NOT RETAINING UPLAND SOIL TO BE REMOVED. SEE 7/D502 AND 8/D502 FOR EXAMPLES. CARE TO BE TAKEN NOT TO DISTURB TIMBERS BELOW WATERLINE.
Y	CONCRETE FOUNDATIONS TO REMAIN IN PLACE. CARE TO BE TAKEN NOT TO DAMAGE VERTICAL TIMBER PILES SUPPORTING FOUNDATIONS.
Z	UPLAND GRADE TO REMAIN. AREAS WHERE GRADE IS UNEVEN AND UNUSABLE TO BE GRADED FOR USE AS ACCESS WILL REQUIRE ADDITIONAL MATERIAL FOR TEMPORARY ACCESS, SEE G103 FOR TEMPORARY ACCESS PLAN.
AA	TIMBER FENDER TO BE REMOVED. STEEL EMBED PLATES TO BE CUT FLUSH WITH FACE OF CONCRETE. CARE TO BE TAKEN TO PREVENT DAMAGE TO EXISTING CONCRETE FACE.
BB	TIMBER MASK WALL TO BE REMOVED FROM STATIONS 0+76 TO 2+61 AND 4+05 TO 6+61. SEE 9/D502.
CC	MISCELLANEOUS STEEL DUCTWORK, TIERODS, AND OTHER DEBRIS TO BE REMOVED IN UPLANDS AREA.

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WISCONSIN LAURAN B. LARSON E-28805 EAU CLAIRE, WI PROFESSIONAL ENGINEER

Revision Schedule			
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GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

DEMOLITION PLANS & NOTES

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: WDK/JTF
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SHEET:
D101

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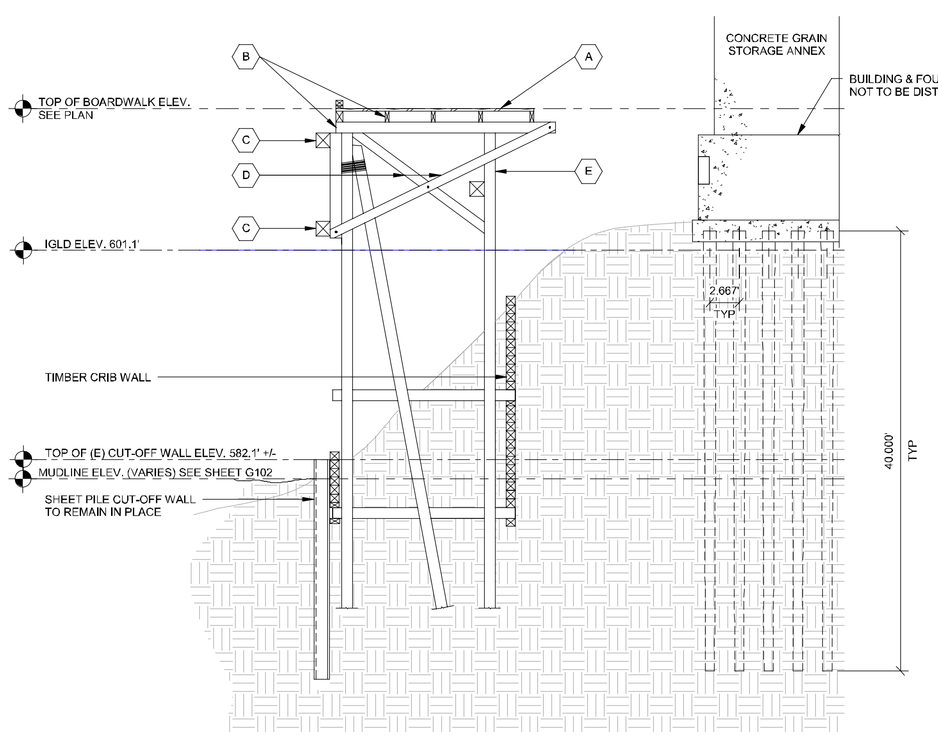
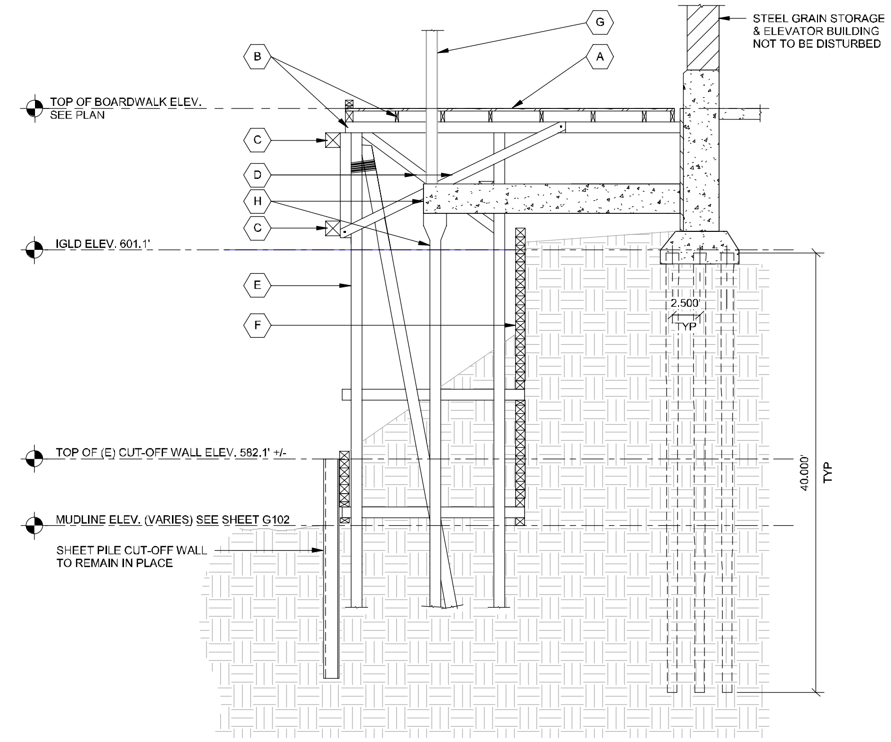
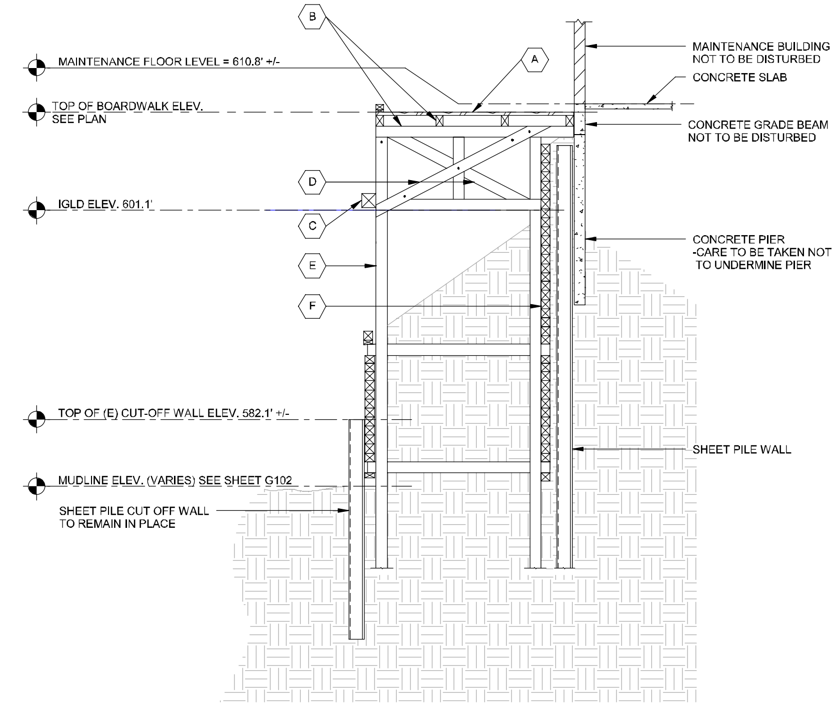


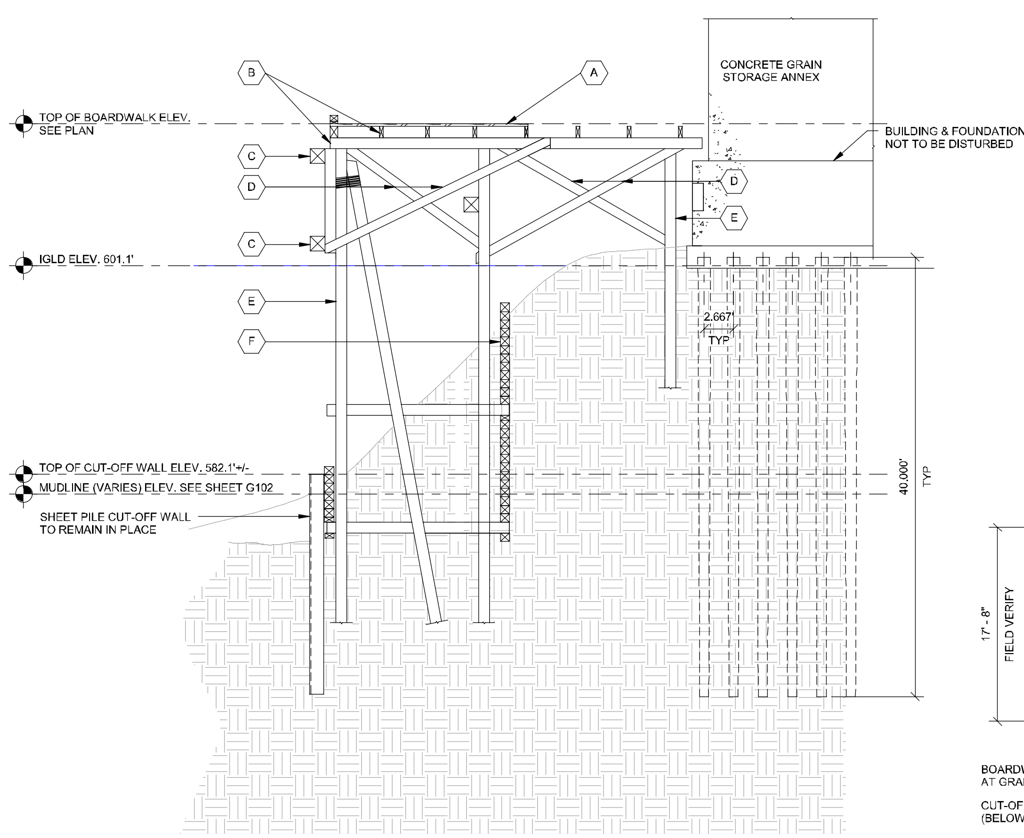
1 D501 DEMO SECTION @ CONCRETE GRAIN STORAGE ANNEX
1/8" = 1'-0"



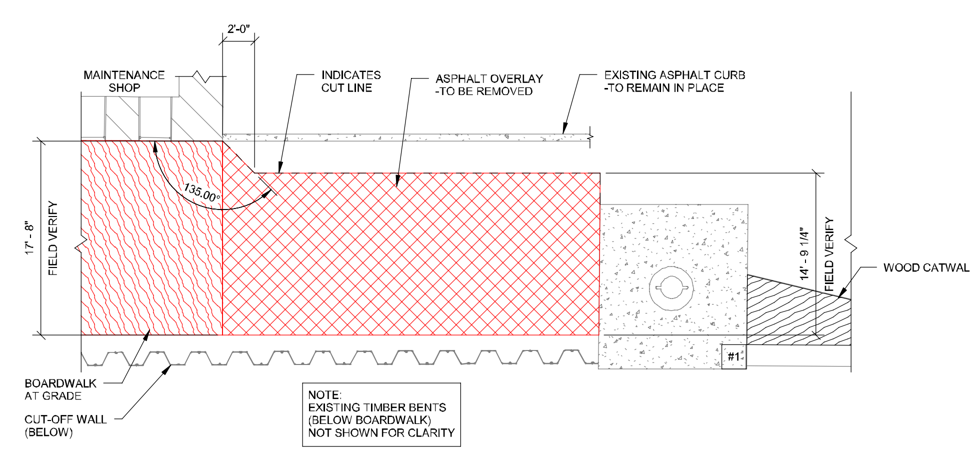
2 D501 DEMO SECTION @ STEEL GRAIN STORAGE ELEVATORS
1/8" = 1'-0"



3 D501 DEMO SECTION @ MAINTENANCE SHOP
1/8" = 1'-0"



4 D501 DEMO SECTION @ DOLPHIN #7
1/8" = 1'-0"



5 D501 EXISTING ASPHALT OVERLAY DEMO DETAIL
1/8" = 1'-0"

DEMOLITION KEY NOTES

A	DEMO EXISTING BOARDWALK FROM STATION 0+76 TO 10+59 - PER D101
B	DEMO EXISTING BOARDWALK SUPPORT BEAMS, TYP
C	DEMO EXISTING TIMBER FENDERS AND VERTICAL SUPPORT BEAM, TYP
D	DEMO EXISTING CROSS BRACING ABOVE ELEVATION 601.0', TYP
E	DEMO EXISTING VERTICAL TIMBER PILES, CUT TIMBERS AT ELEVATION 602.0'. LOWER PORTION OF TIMBER PILES TO REMAIN IN PLACE
F	EXISTING TIMBER CRIB WALL - SEE D101
G	EXISTING SPOUT TOWER COLUMN NOT TO BE DISTURBED
H	EXISTING CONCRETE PAD & VERTICAL PILES NOT TO BE DISTURBED

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Revision Schedule			
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GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

DEMOLITION SECTIONS & DETAILS

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: WOK/JTF
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SHEET:
D501

AT GRADE BOARDWALK
G D101

1 D502 AT GRADE TIMBER DECK
N.T.S.

STAIR AND HANDRAILS
H D101

AT GRADE BOARDWALK
G D101

2 D502 TIMBER DECK TRANSITION FROM GRADE TO ELEVATED
N.T.S.

SPOUT TOWER - NOT TO BE DISTURBED

STEEL GRAIN STORAGE ELEVATORS
U D101

ELEVATED BOARDWALK
I D101

3 D502 ELEVATED TIMBER DECK
N.T.S.

FENDER
S D101

ELEVATED BOARDWALK
I D101

4 D502 ELEVATED TIMBER DECK
N.T.S.

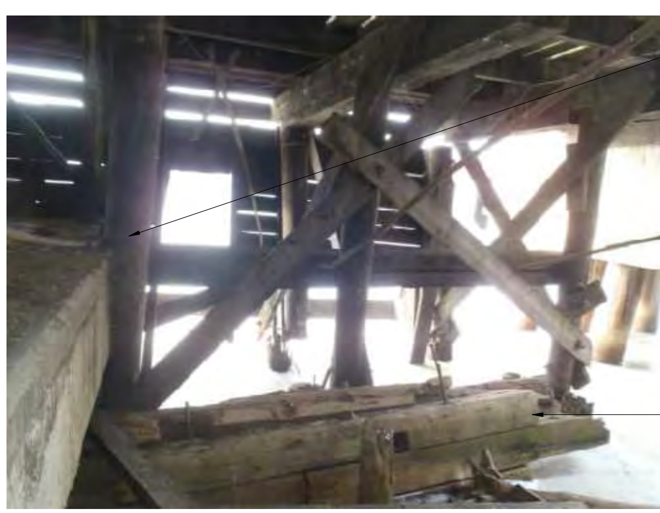
TIMBER BENTS AND BRACING
W D101

SPOUT CONCRETE SUPPORT PAD
Y D101

5 D502 BENTS BELOW ELEVATED TIMBER DECK
N.T.S.

TIMBER BENTS
W D101

6 D502 ADDITIONAL TIMBER AT BENTS NEAR DOLPHIN #7
N.T.S.

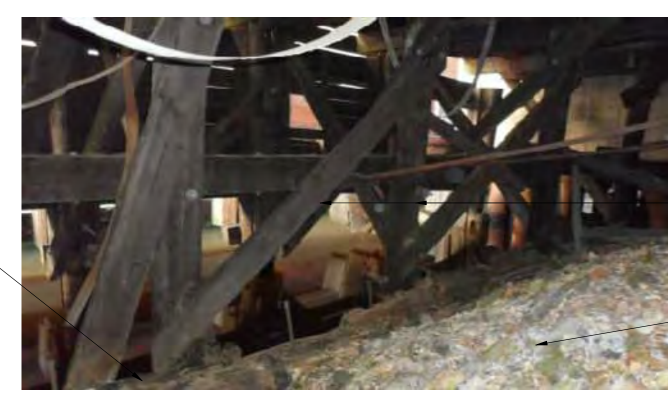


TIMBER PILE ENCASED IN CONCRETE TO BE CUT AND REMOVED AT UPPER FACE OF CONCRETE

TIMBER CRIB TO REMAIN WHERE UPLAND GRADE IS RETAINED
X D101

TOP OF CRIB TO BE REMOVED DOWN TO WATERLINE WHERE UPLAND GRADE IS NOT RETAINED
X D101

7 D502 BENT SPECIAL CONDITION
N.T.S.



TIMBER BENTS AND BRACING
W D101

UPLAND GRADE
Z D101

8 D502 CRIB RETAINING FILL
N.T.S.

FENDER
S D101

TIMBER MASK WALL
DD D101

9 D502 WOOD MASK WALL
N.T.S.

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Revision Schedule

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GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

DEMOLITION IMAGES

JOB No: 122248
DATE: 03.04.2013
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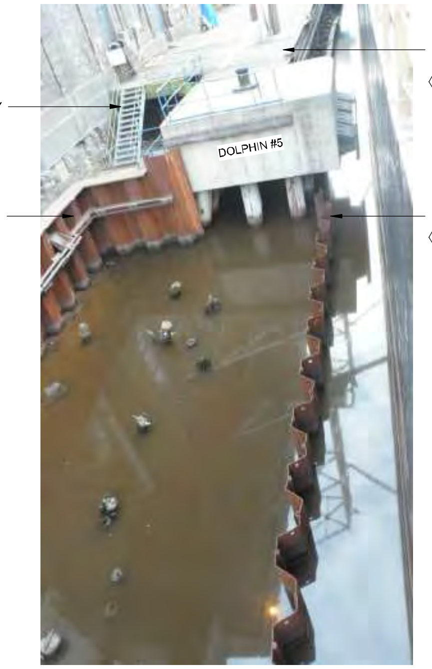
SHEET:
D502

ACCESS STAIRWAY (O) D101
EXISTING SHEET PILE WALL (P) D101
ELEVATED BOARDWALK (I) D101
EXISTING SHEET PILE (P) D101



1 (D503) EXISTING SHEET PILE WALLS
N.T.S.

CATWALK (Q) D101
TURNING CELL - NOT TO BE DISTURBED

EXISTING PILE (R) D101

2 (D503) EXISTING PILES TO BE REMOVED
N.T.S.

ASPHALT CURB (B) D101

ASPHALT OVERLAY (C) D101

3 (D503) ASPHALT OVERLAY
N.T.S.

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GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

DEMOLITION IMAGES

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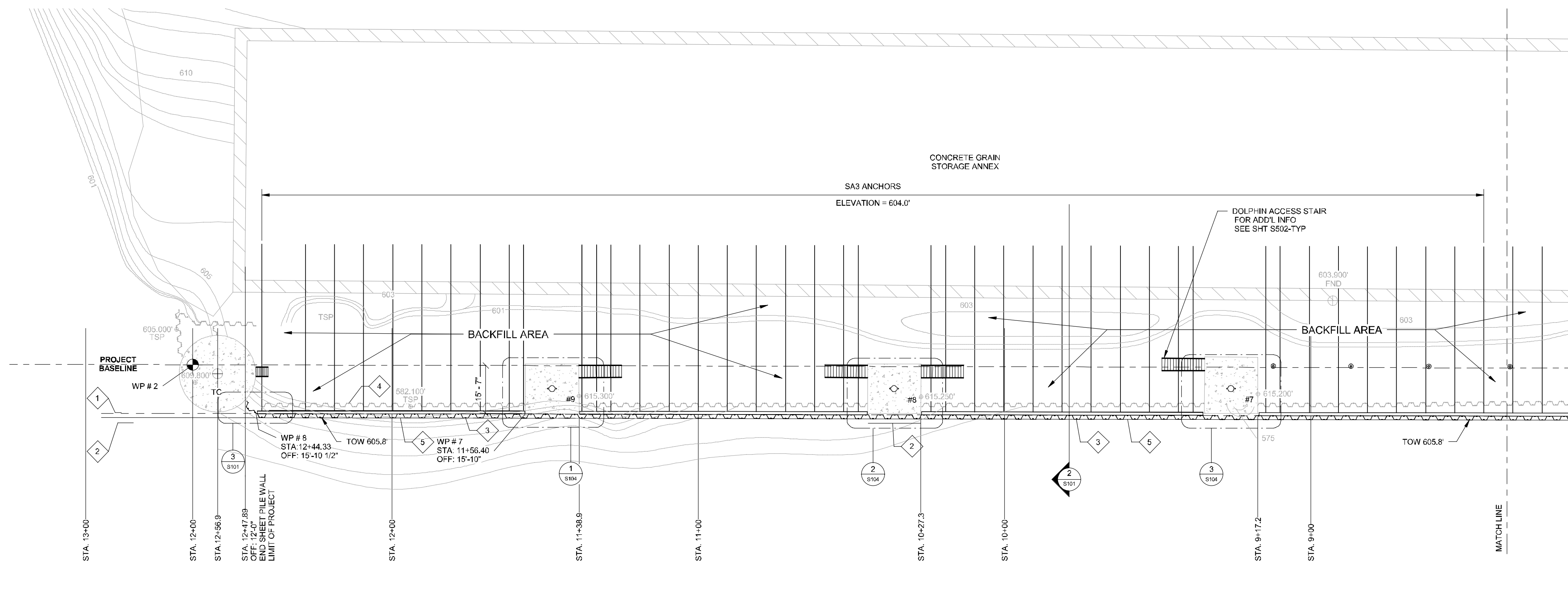
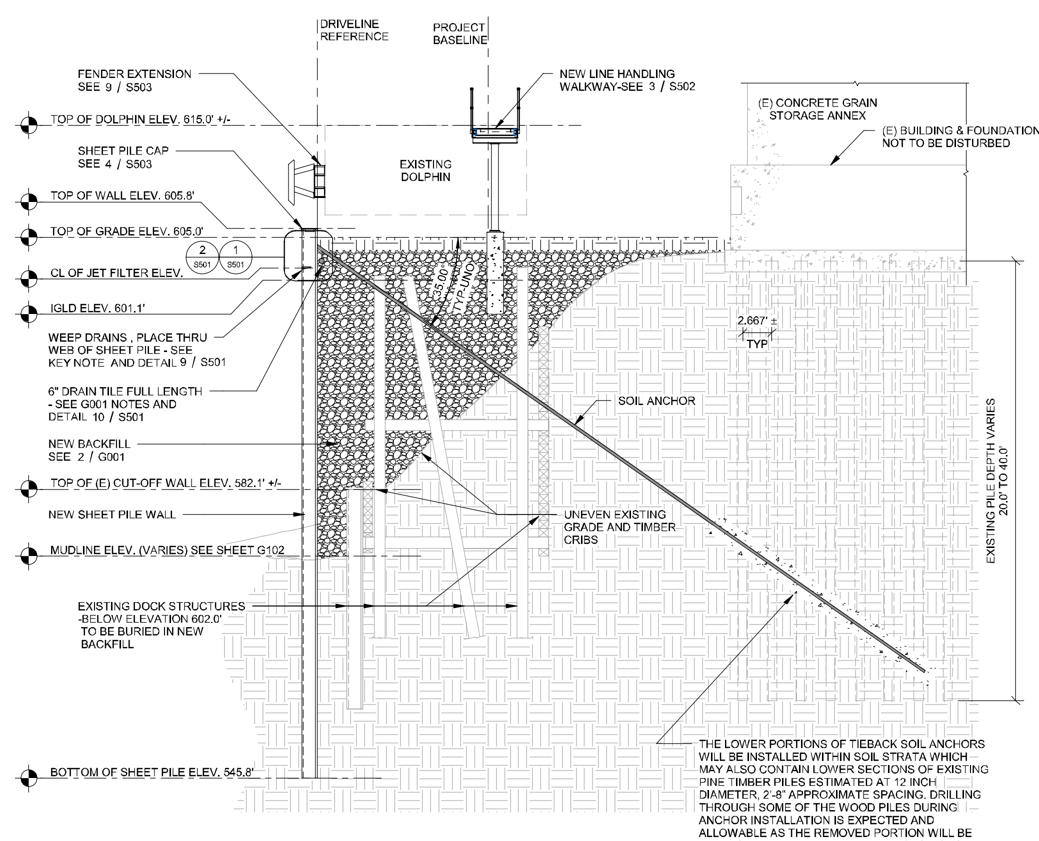


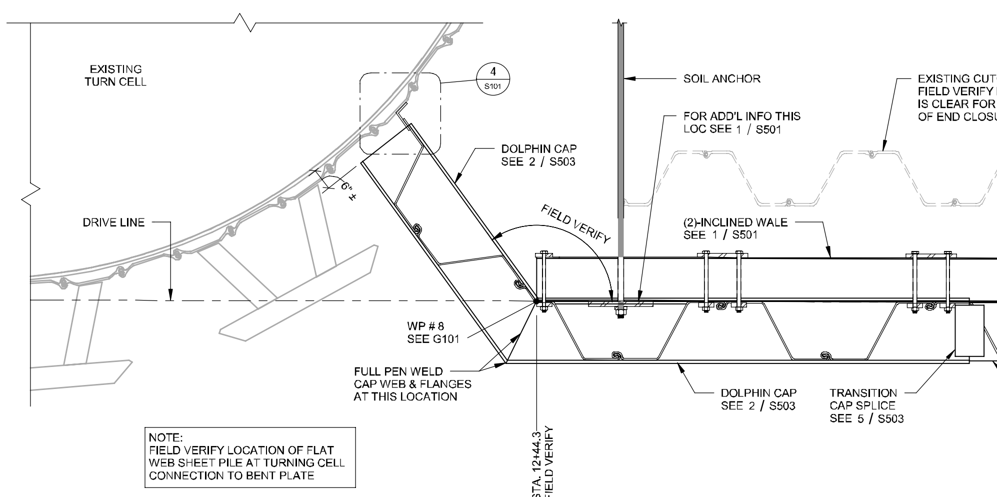
1 DOCK LAYOUT G.A. PLAN
S101 1" = 20'-0"

KEY NOTES:

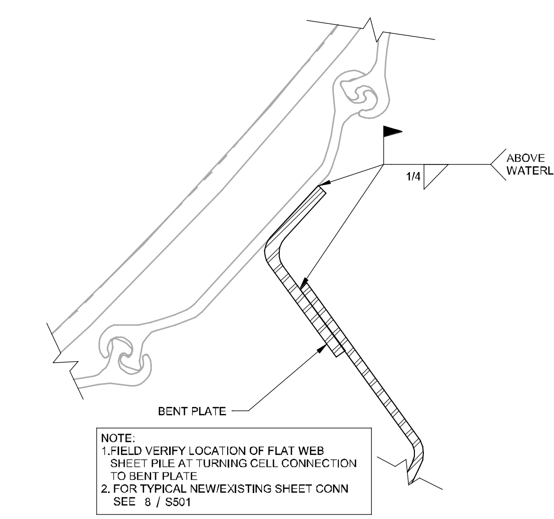
1. DRIVE LINE - INSIDE FACE OF SHEET PILE
2. BERTHING LINE - OUTSIDE FACE OF FENDERS
3. SKZ25 STEEL SHEET PILE WALL
4. EXISTING SUBMERGED CUTOFF WALL
5. LADDER LOCATION - SEE SHEET S503



2 NEW SECTION @ CONCRETE GRAIN STORAGE ANNEX
S101 1/8" = 1'-0"



3 NEW WALL TO TURN CELL CONNECTION DETAIL (END CLOSURE)
S101 1/2" = 1'-0"



4 ENLARGED CONNECTION DETAIL @ TURN CELL
S101 3" = 1'-0"

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Revision Schedule

Date	#	Description	By

GENERAL MILLS SUPERIOR DOCK REHAB

SUPERIOR, WI

ENLARGED PLAN & SECTIONS

JOB No: 122248
DATE: 03.04.2013
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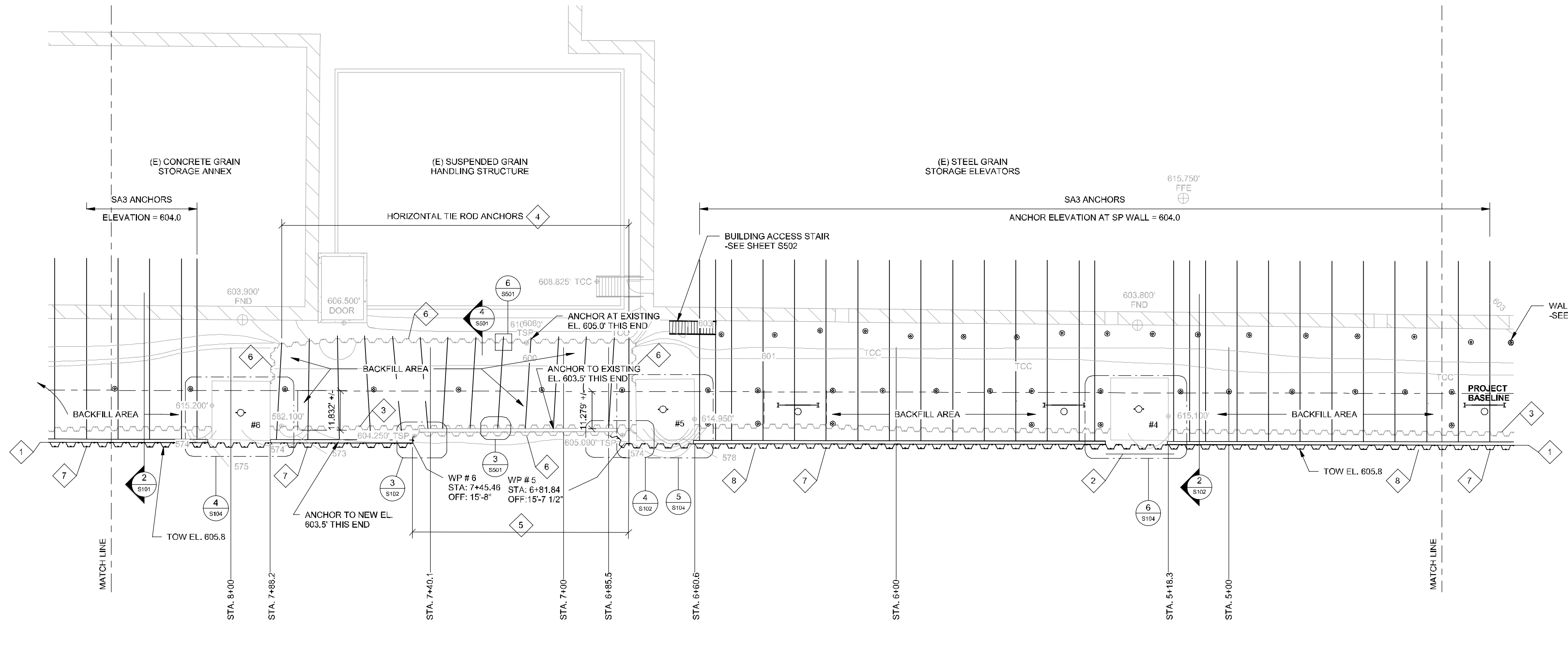
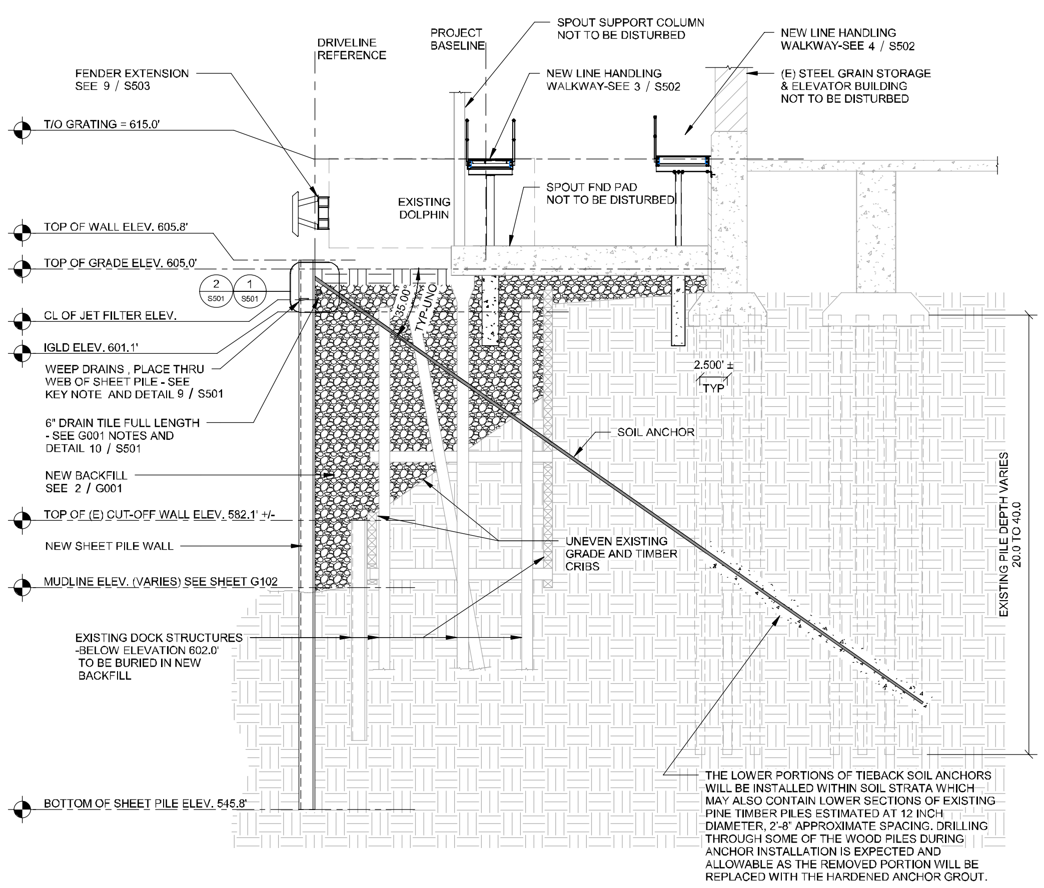
S101



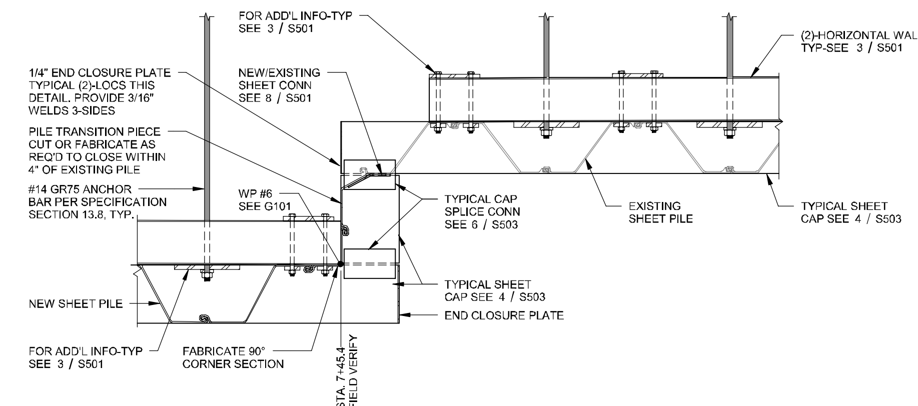
1 DOCK LAYOUT PLAN
S102 1" = 20'-0"

KEY NOTES:

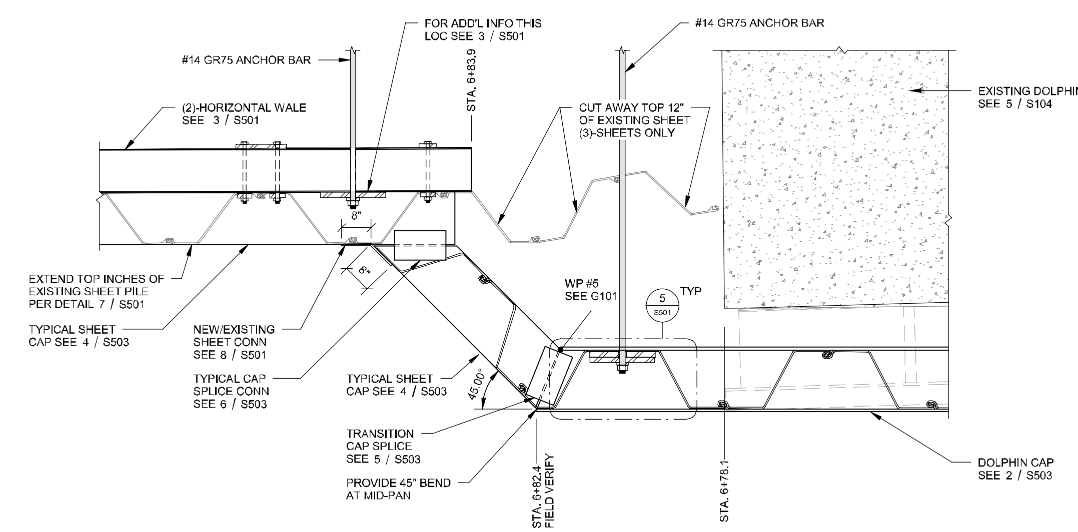
1. DRIVE LINE - INSIDE FACE OF SHEET PILE
2. BERTHING LINE - OUTSIDE FACE OF FENDERS
3. (E) CUT-OFF WALL LOCATION
4. INSTALL #14 GR 75 TIE ANCHOR RODS BETWEEN SHEET PILE WALLS THIS AREA - ELEVATION OF ROD ENDS PER PLAN
5. INSTALL #14 GR 75 TIE ANCHOR RODS BETWEEN EXISTING SHEET PILE WALLS THIS AREA, EXTEND TOP OF EXISTING WALL TO EL. 605.8' PER 7/S501
6. EXISTING SHEET PILE WALL
7. SKZ25 STEEL SHEET PILE WALL
8. LADDER LOCATION - SEE SHEET S503



2 NEW SECTION @ STEEL GRAIN STORAGE ELEVATORS
S102 1/8" = 1'-0"



3 NEW WALL TO EXISTING WALL CONNECTION DETAIL (NORTH)
S102 1/2" = 1'-0"



4 NEW WALL TO EXISTING WALL CONNECTION DETAIL (SOUTH)
S102 1/2" = 1'-0"

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WISCONSIN LAURAN B. LARSON E-29805 EAU CLAIRE, WI PROFESSIONAL ENGINEER

Revision Schedule			
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GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

ENLARGED PLAN & SECTIONS

JOB No: 122248
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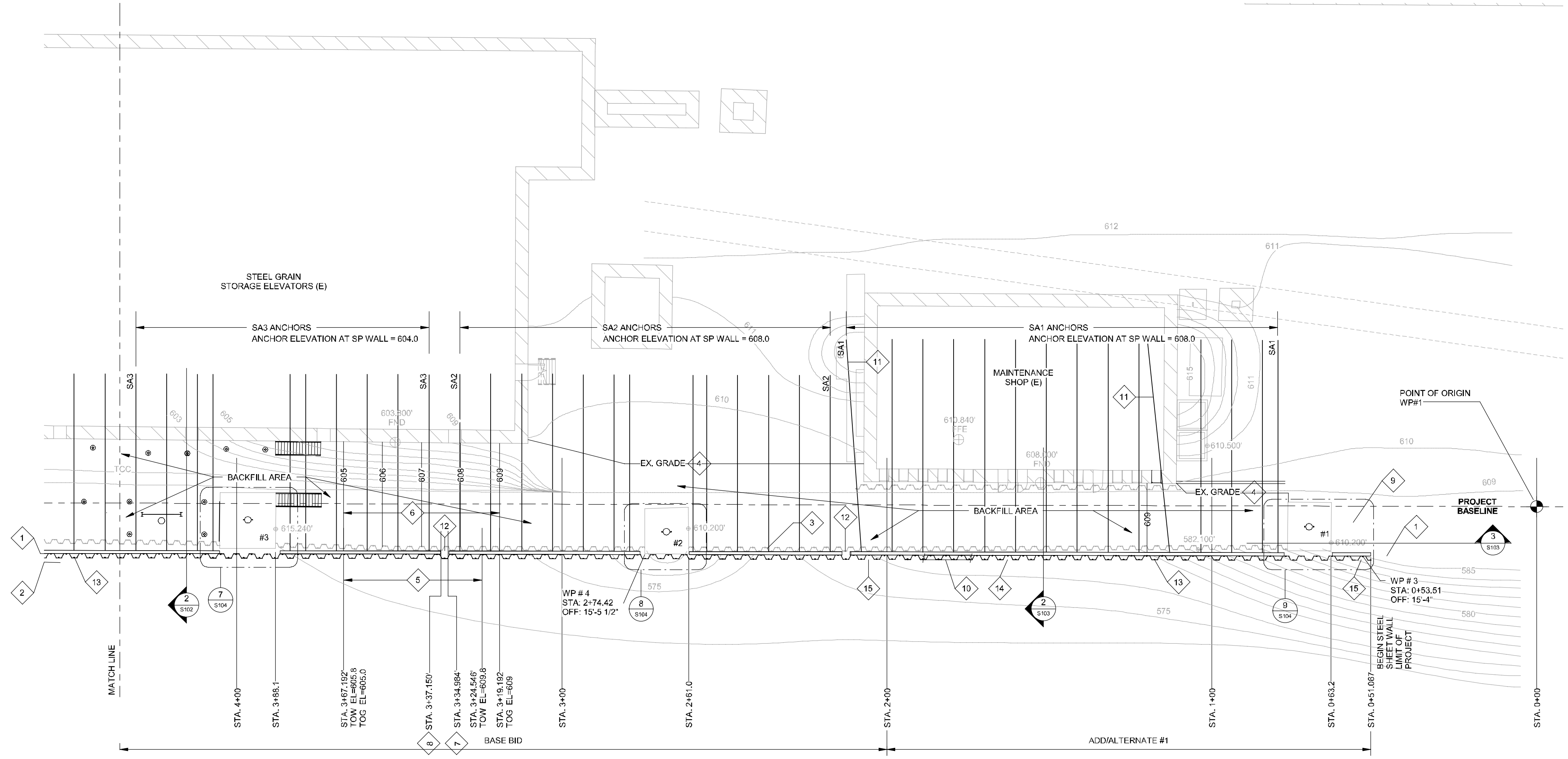
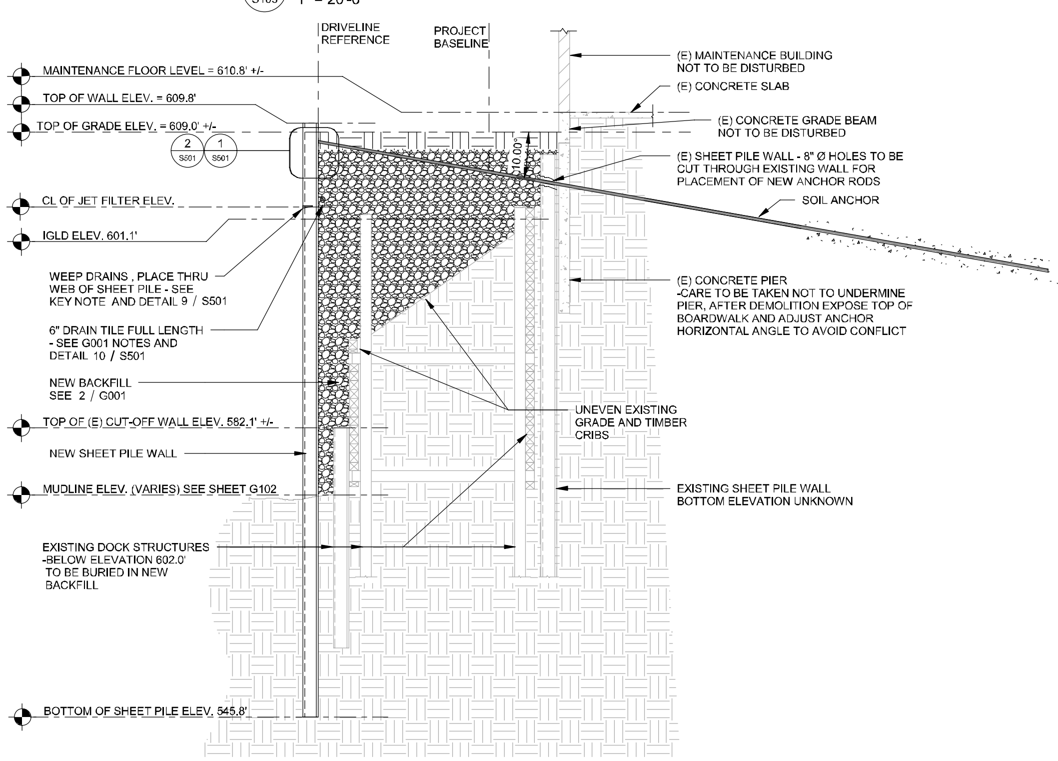
SHEET:
S102



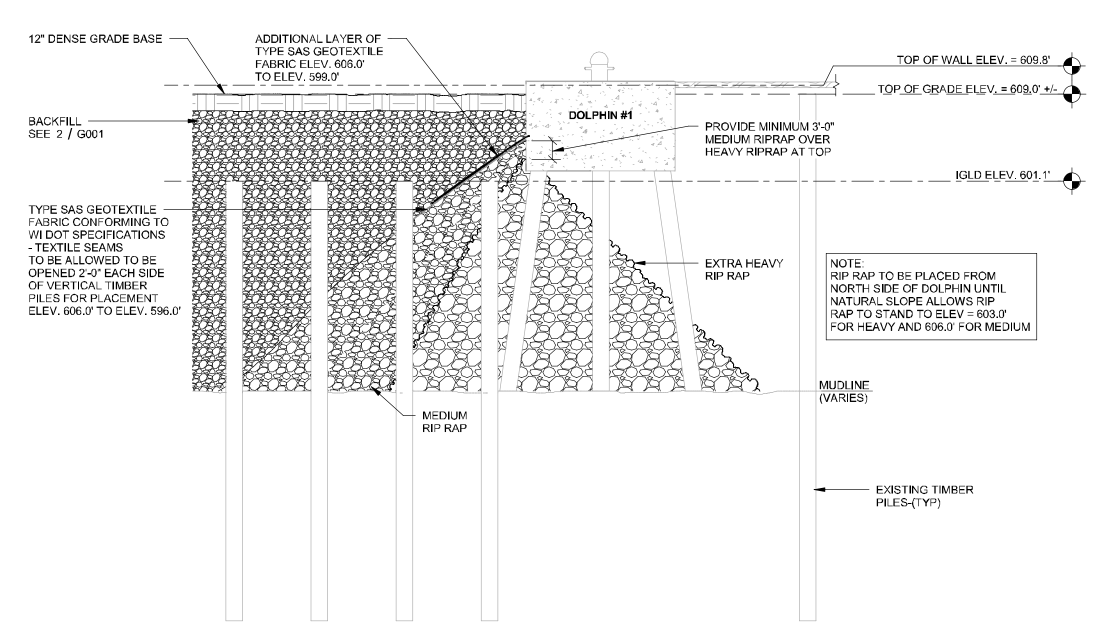
1 DOCK LAYOUT PLAN
S103 1" = 20'-0"

KEY NOTES:

1. SHEET PILE DRIVE LINE REFERENCE - UPLAND FACE OF INPAN
2. BERTHING LINE - OUTSIDE FACE OF FENDERS
3. SUBMERGED CUT-OFF WALL LOCATION (E)
4. MATCH EXISTING GRADE - SLOPE FILL FROM ELEVATION 609' TO MATCH EXISTING - SLOPE TO BE 1:12 MAX
5. WALL ELEVATION TO BE SLOPED FROM 609.8' DOWN TO 605.8' -WALL ELEVATION TO REMAIN MIN 10" ABOVE GRADE ELEVATION
6. SLOPE GRADE AT 1:12 FROM 609.0' TO 605.0'
7. NORTH EXTENT OF WALE FOR ELEV 608.0' ANCHORS
8. SOUTH EXTENT OF WALE FOR ELEV 604.0' ANCHORS
9. SHEET PILE WALL ANCHORAGE NOT DESIGNED FOR BACKFILL TO GRADE, THIS AREA
10. CONT WALL CAP NOT SHOWN FOR CLARITY
11. ROTATE INSTALLATION ANGLE AS REQUIRED TO AVOID CONFLICTS WITH EXISTING CONCRETE PIER AND/OR SANITARY HOLDING TANKS
12. WALES DISCONTINUOUS AT INCLINATION ANGLE TRANSITION AND ELEVATION TRANSITION
13. SKZ25 STEEL SHEET PILE WALL
14. LADDER LOCATION - SEE SHEET S503
15. REQUIRED TEST PILE LOCATION



2 NEW SECTION @ MAINTENANCE SHOP
S103 1/8" = 1'-0"



3 SECTION DETAIL DOLPHIN #1
S103 1/8" = 1'-0"

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WISCONSIN LAURAN B. LARSON E-28805 EAU CLAIRE, WI PROFESSIONAL ENGINEER

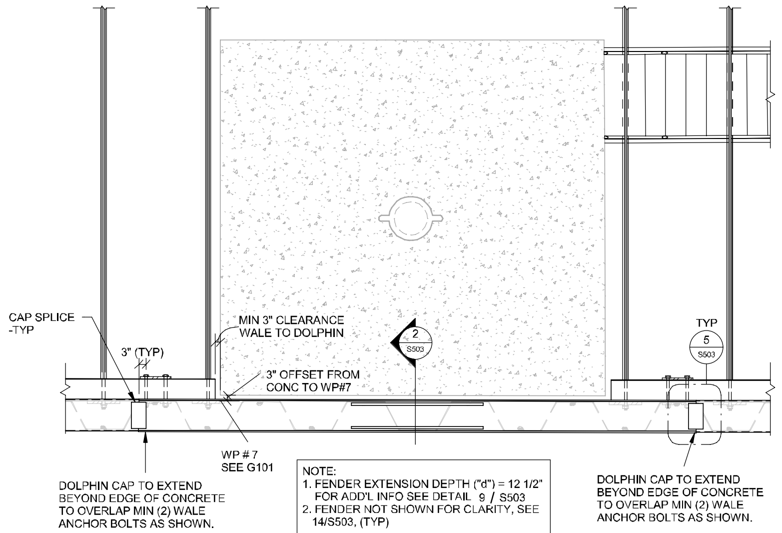
Date	#	Revision Schedule Description	By

GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

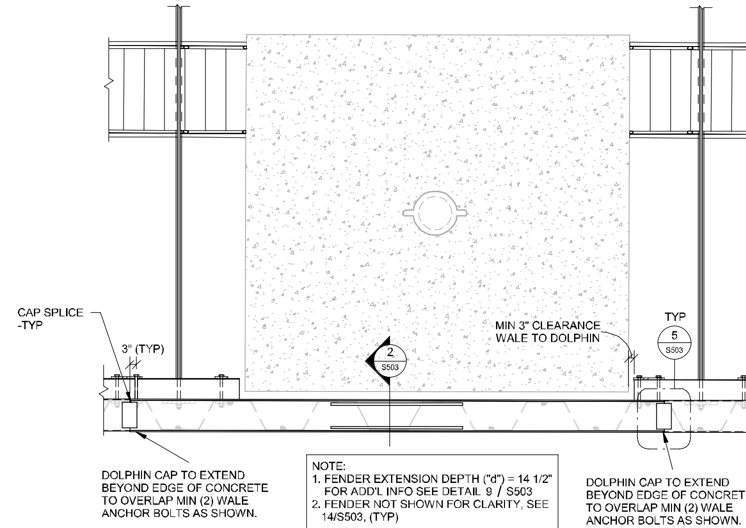
ENLARGED PLAN & SECTIONS

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: WDK/JTF
CHECKED BY: LBL/CIP

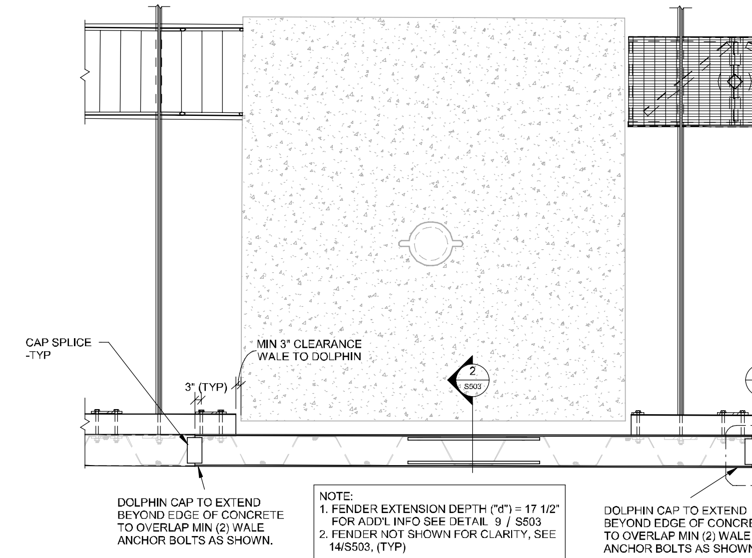
SHEET:
S103



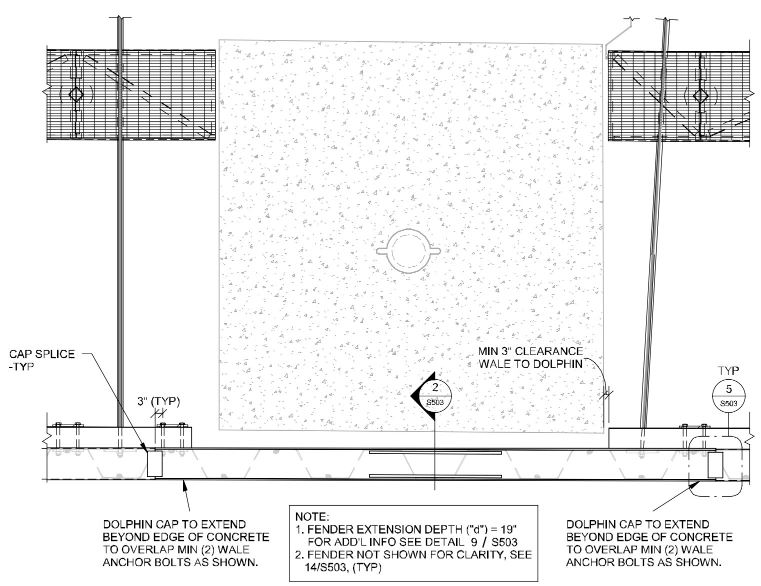
1 S104 DOLPHIN # 9
1/4" = 1'-0"



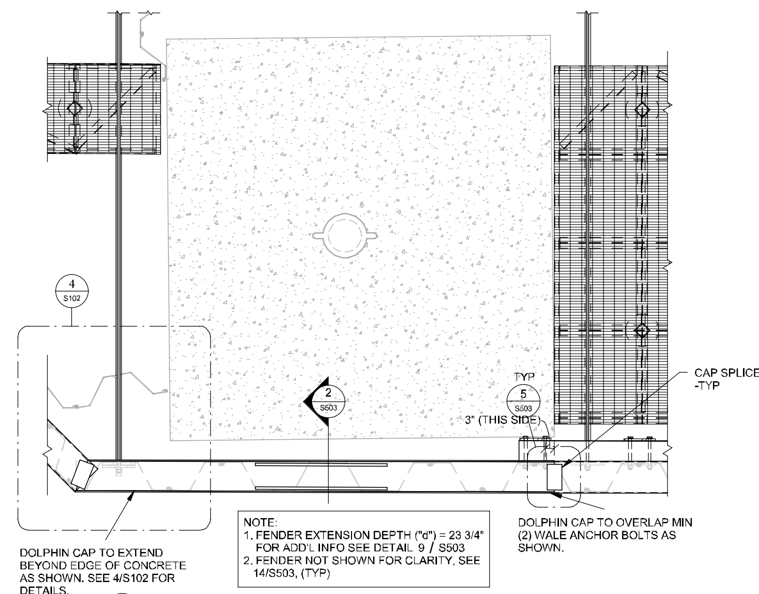
2 S104 DOLPHIN # 8
1/4" = 1'-0"



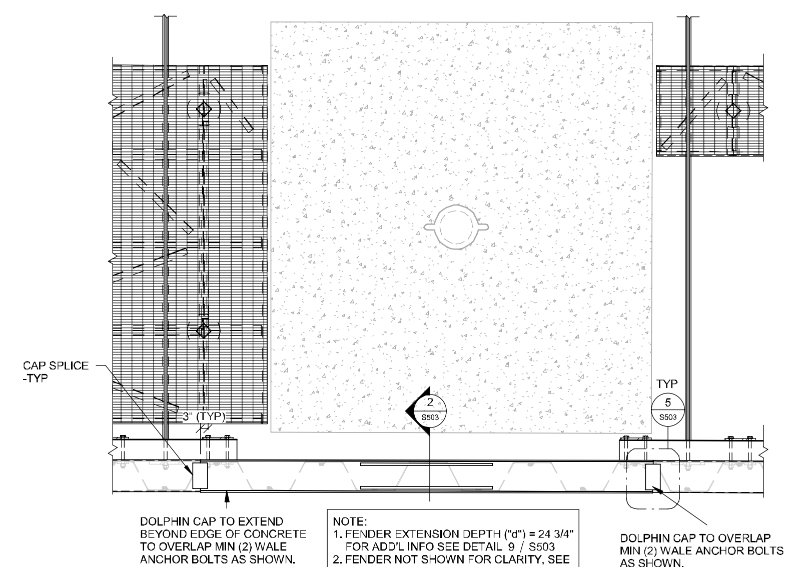
3 S104 DOLPHIN # 7
1/4" = 1'-0"



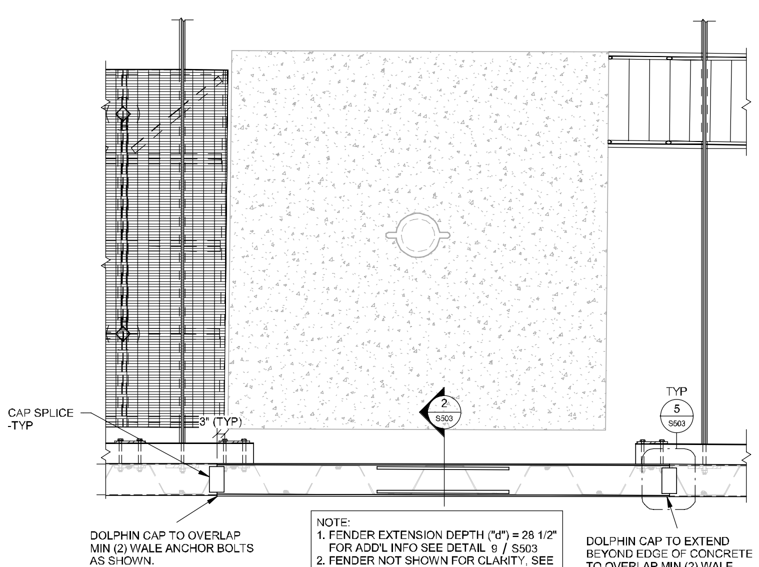
4 S104 DOLPHIN # 6
1/4" = 1'-0"



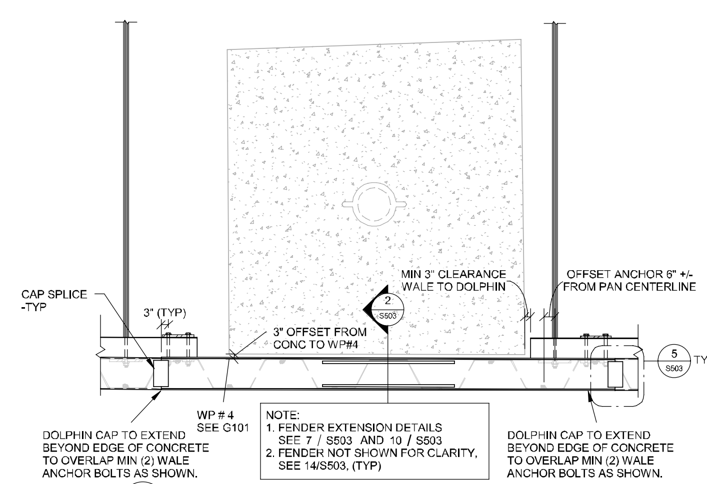
5 S104 DOLPHIN # 5
1/4" = 1'-0"



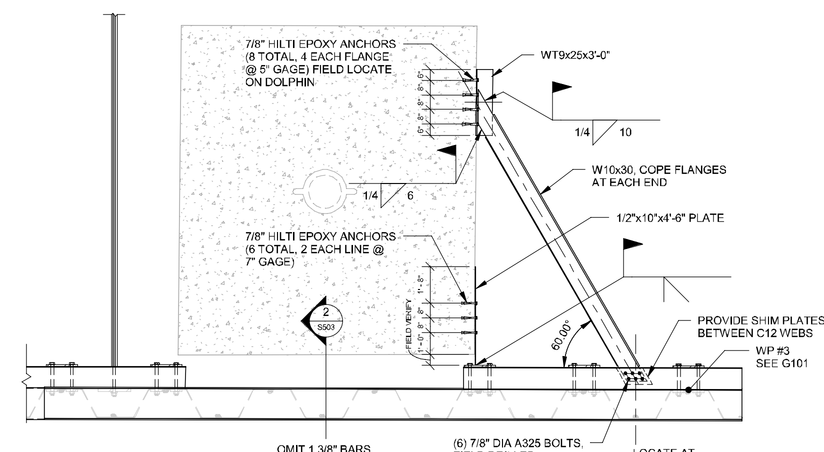
6 S104 DOLPHIN # 4
1/4" = 1'-0"



7 S104 DOLPHIN # 3
1/4" = 1'-0"



8 S104 DOLPHIN # 2
1/4" = 1'-0"



9 S104 DOLPHIN # 1
1/4" = 1'-0"

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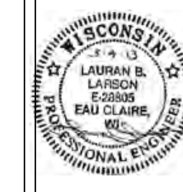

Date	#	Revision Schedule Description	By

GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

ENLARGED FENDER PLANS

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: WDK/JTF
CHECKED BY: LBL/CIP

SHEET:
S104

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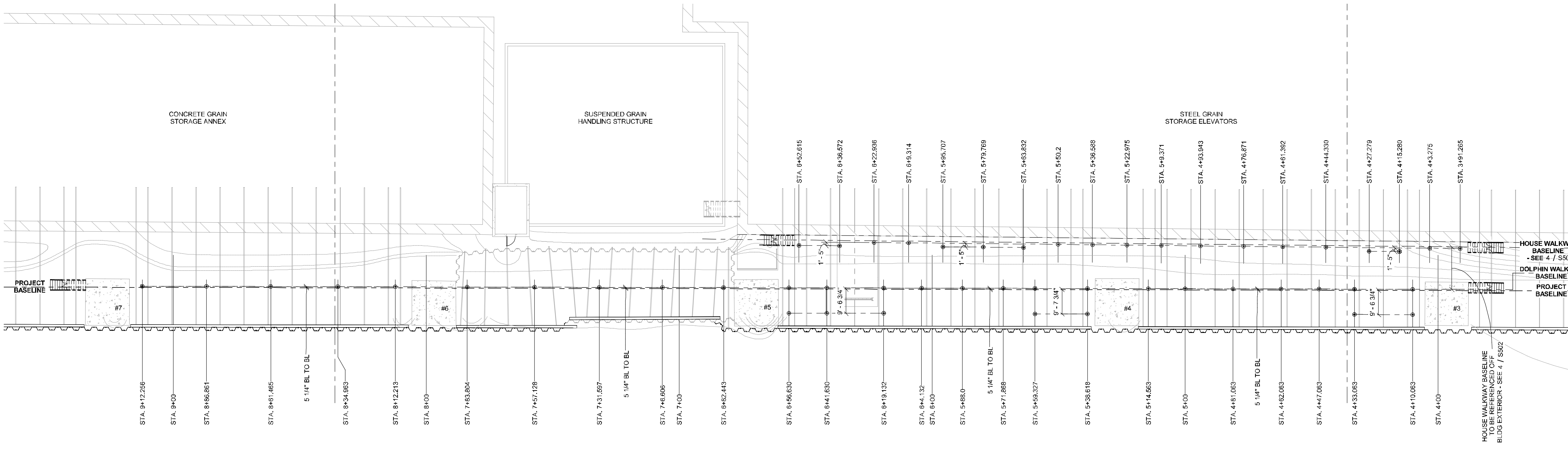
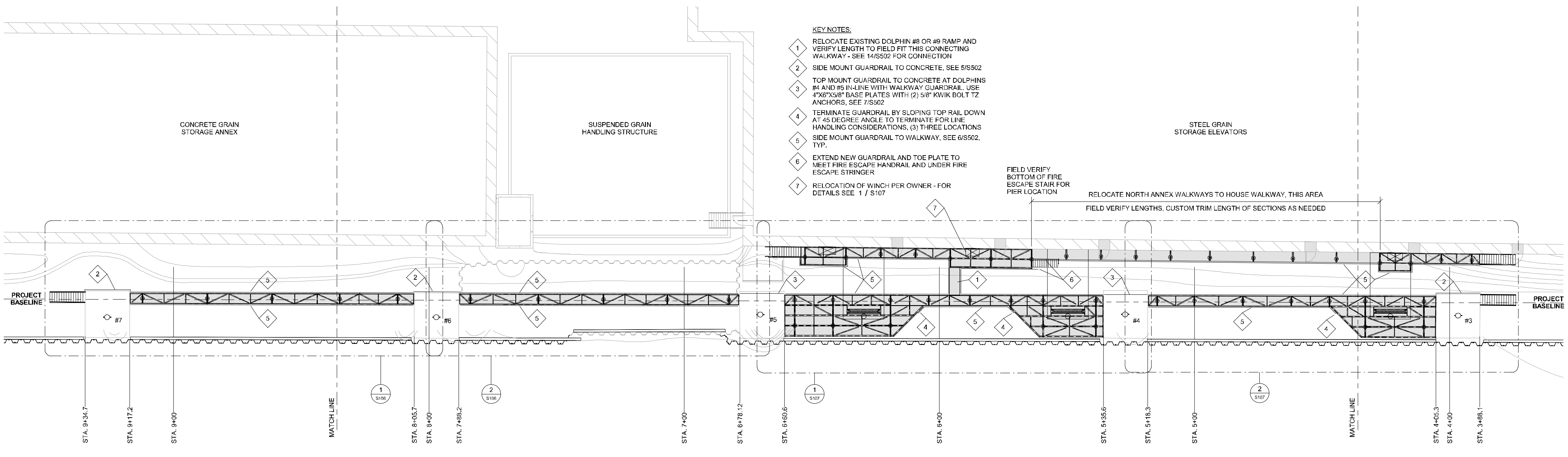


1 ACCESS & WALKWAY PLAN @ EL. 605.0' +/- (PIER LOCATIONS)
S105 1" = 20'-0"



2 ACCESS & WALKWAY PLAN @ EL. 615.0' +/-
S105 1" = 20'-0"

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Revision Schedule			
Date	#	Description	By

GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

ACCESS & WALKWAY PLANS

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: WDK/JTF
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SHEET:
S105

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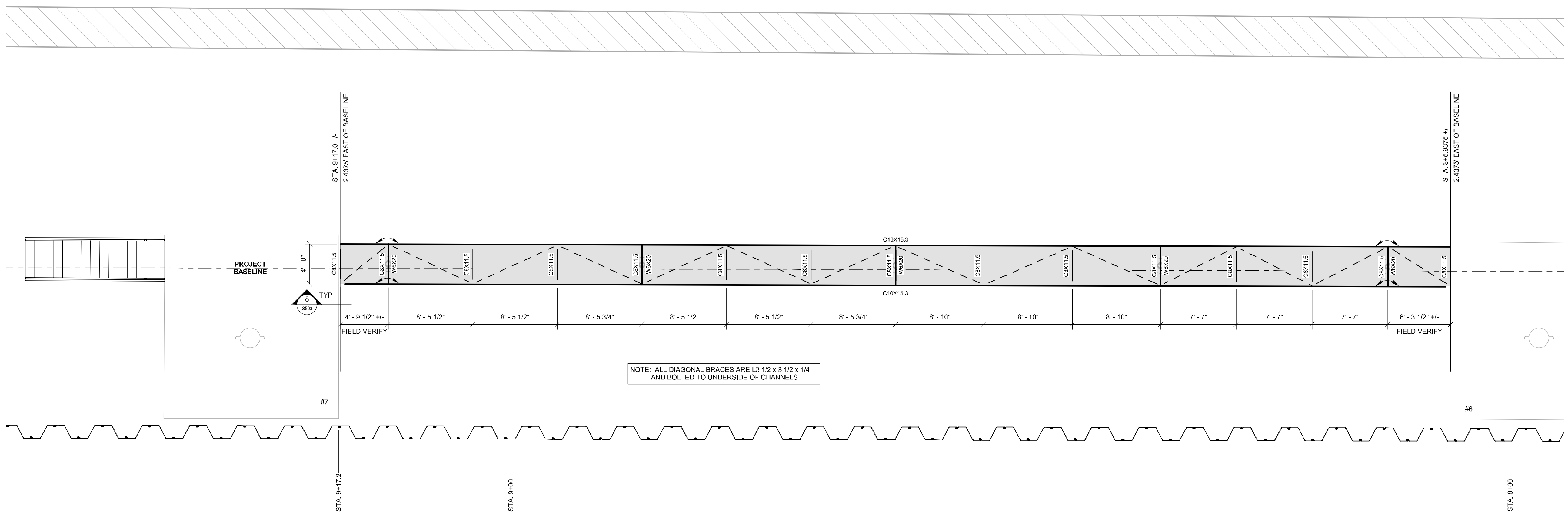
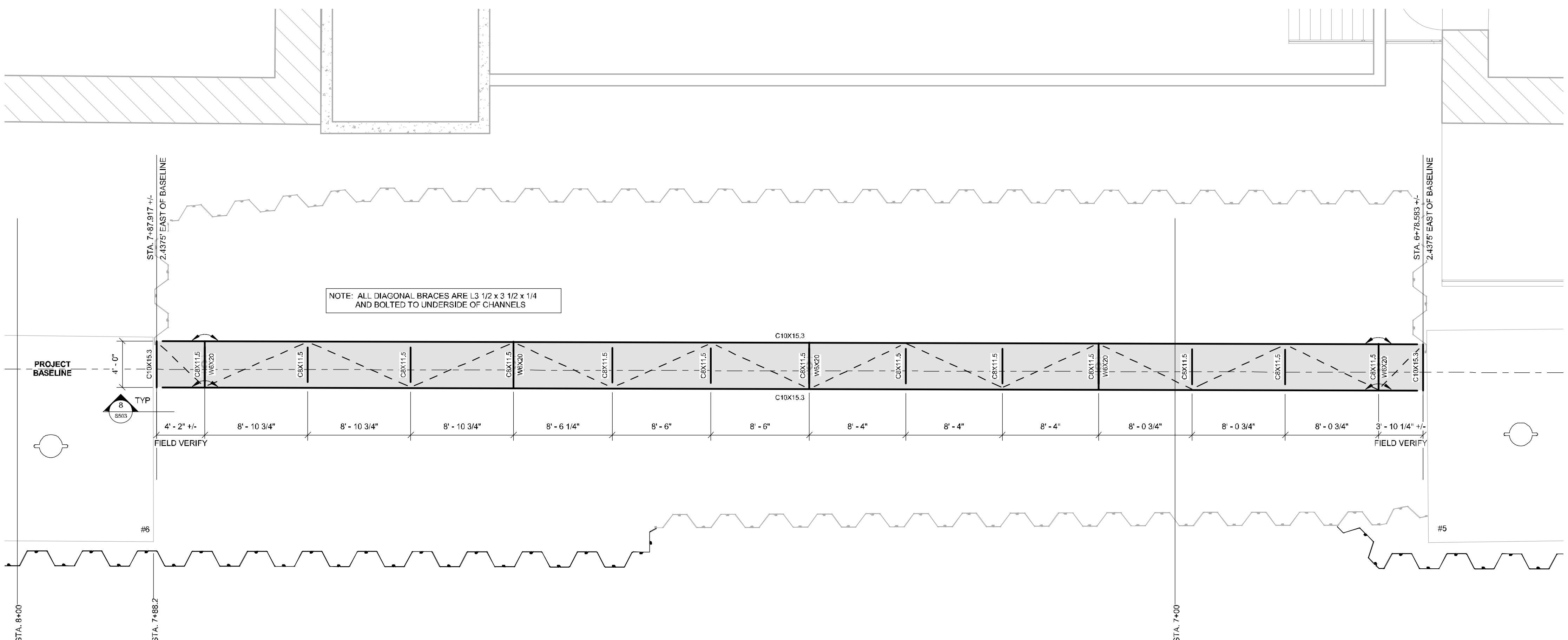


1 WALKWAY FRAMING DOLPHIN #6-#7
S106 3/16" = 1'-0"



2 WALKWAY FRAMING DOLPHIN #5-#6
S106 3/16" = 1'-0"

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PROFESSIONAL ENGINEER

Revision Schedule

Date	#	Description	By

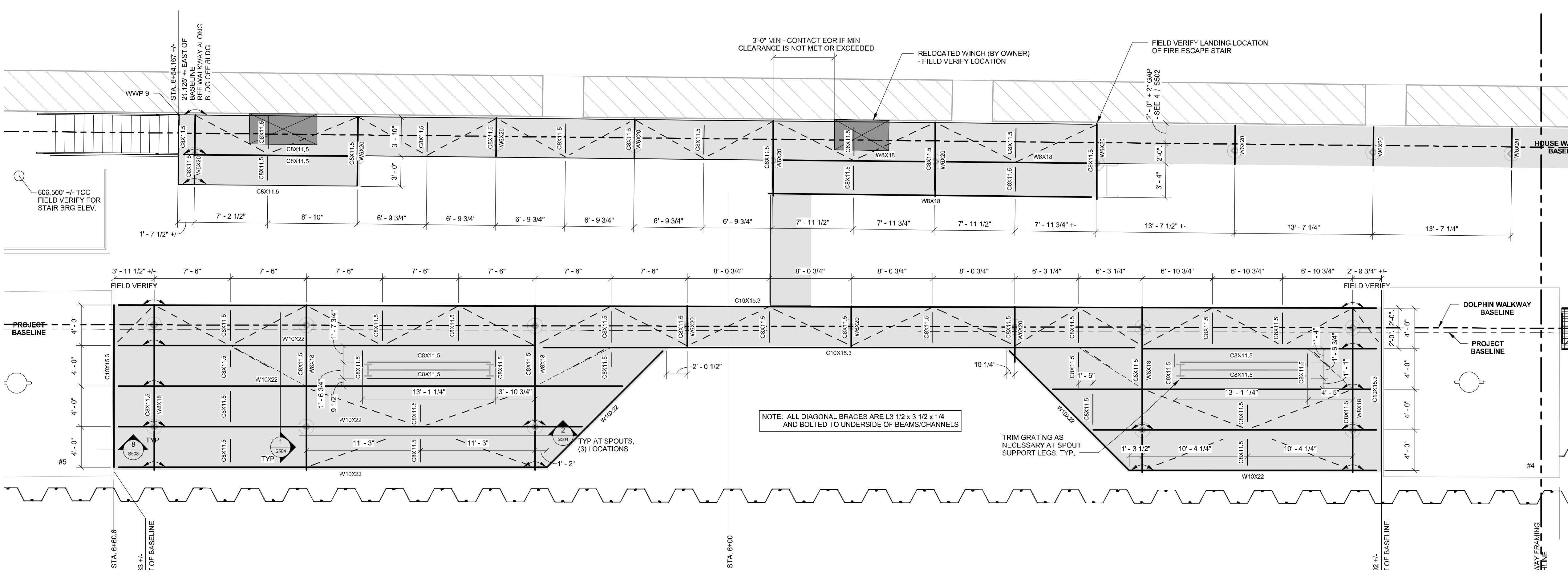
GENERAL MILLS SUPERIOR DOCK REHAB

SUPERIOR, WI

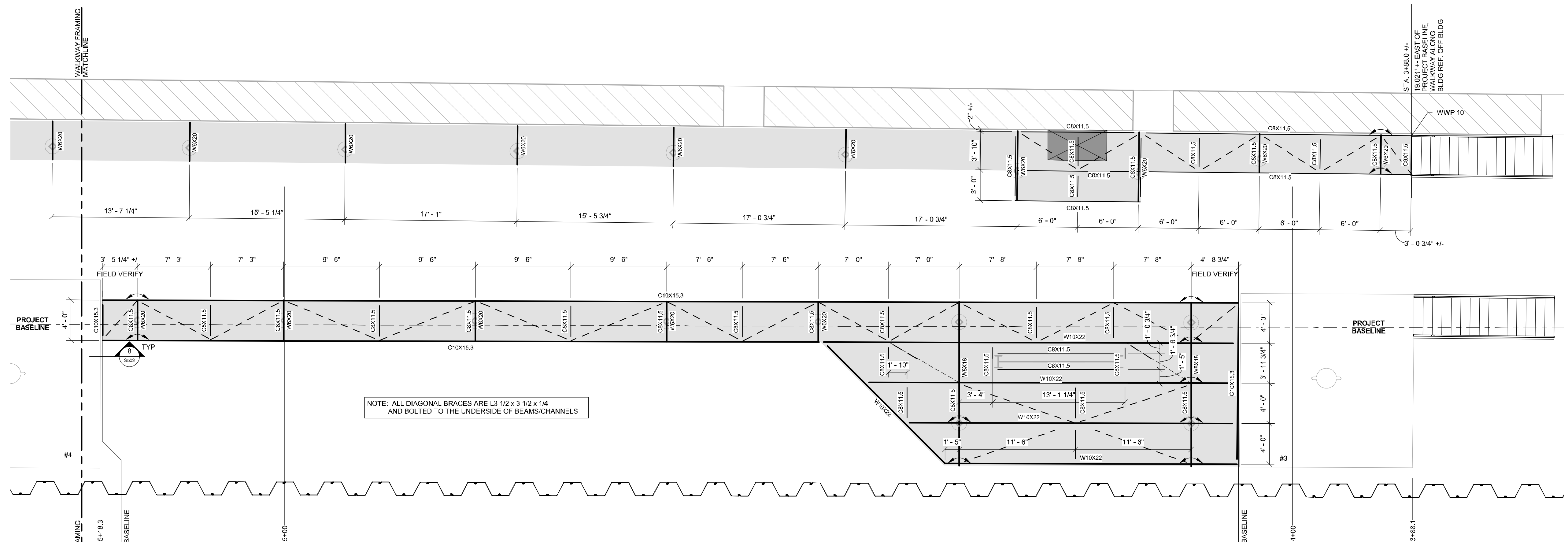
ACCESS & WALKWAY ENLARGED PLANS

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: Author
CHECKED BY: Designer

SHEET:
S106



1 WALKWAY FRAMING DOLPHIN #4-#5
S107 3/16" = 1'-0"



2 WALKWAY FRAMING DOLPHIN #3-#4
S107 3/16" = 1'-0"

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Revision Schedule

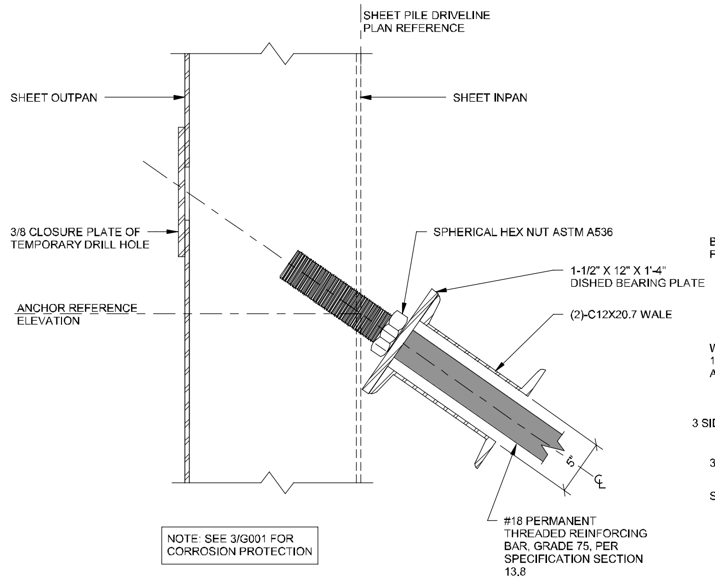
#	Date	Description	By

GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

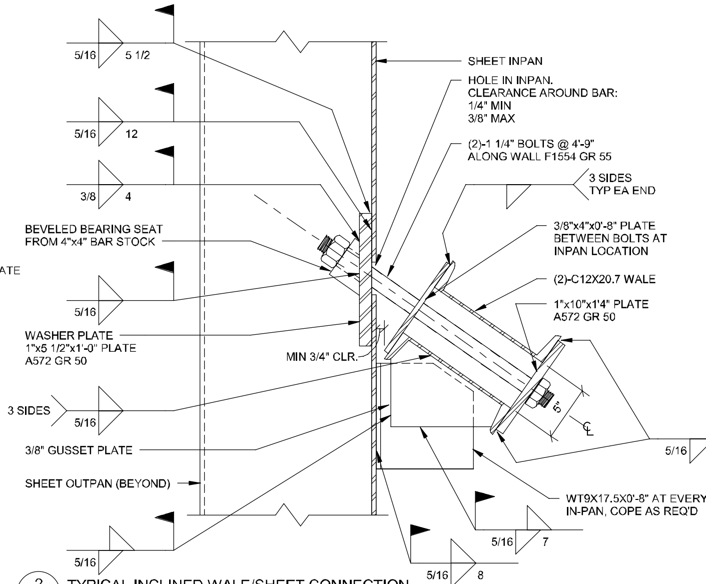
ACCESS & WALKWAY ENLARGED PLANS

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: Author
CHECKED BY: Designer

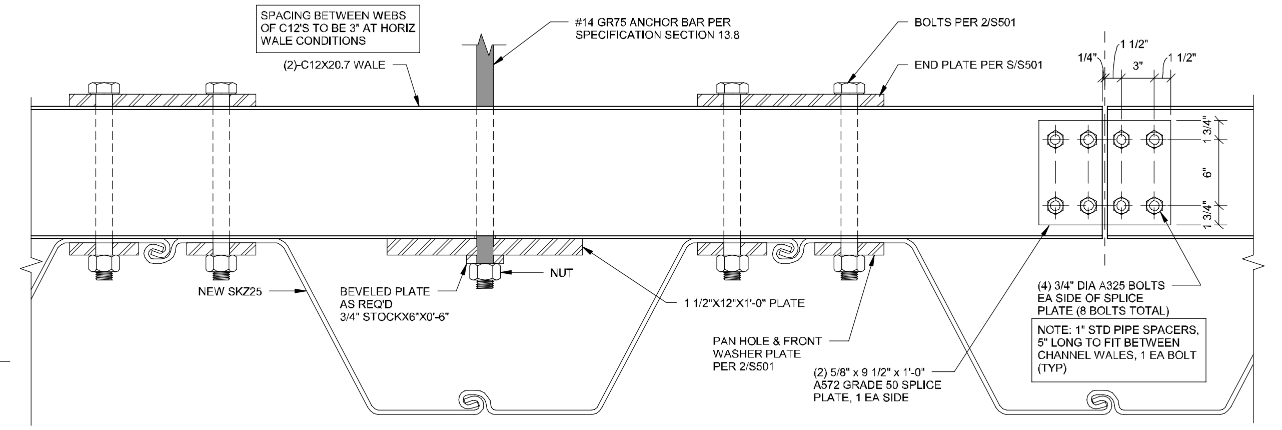
SHEET:
S107



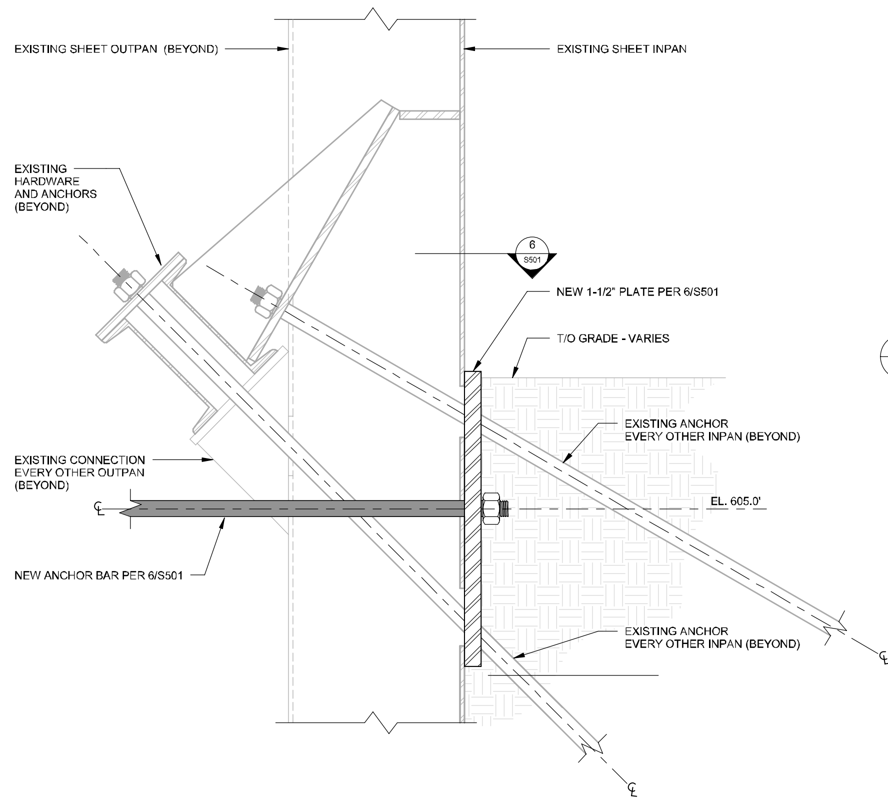
1 S501 TYPICAL ANCHOR/WALE
1 1/2" = 1'-0"



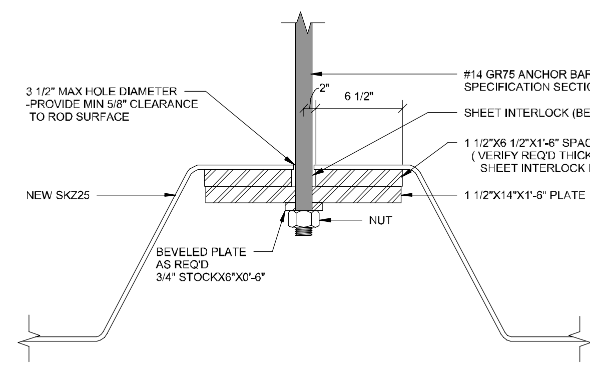
2 S501 TYPICAL INCLINED WALE/SHEET CONNECTION
1 1/2" = 1'-0"



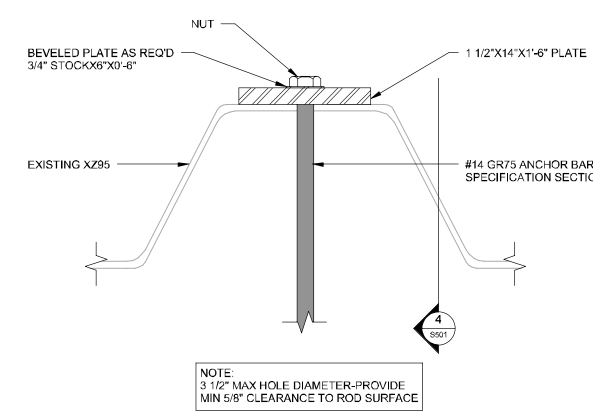
3 S501 TYPICAL HORIZONTAL ANCHOR/WALE PLAN
1 1/2" = 1'-0"



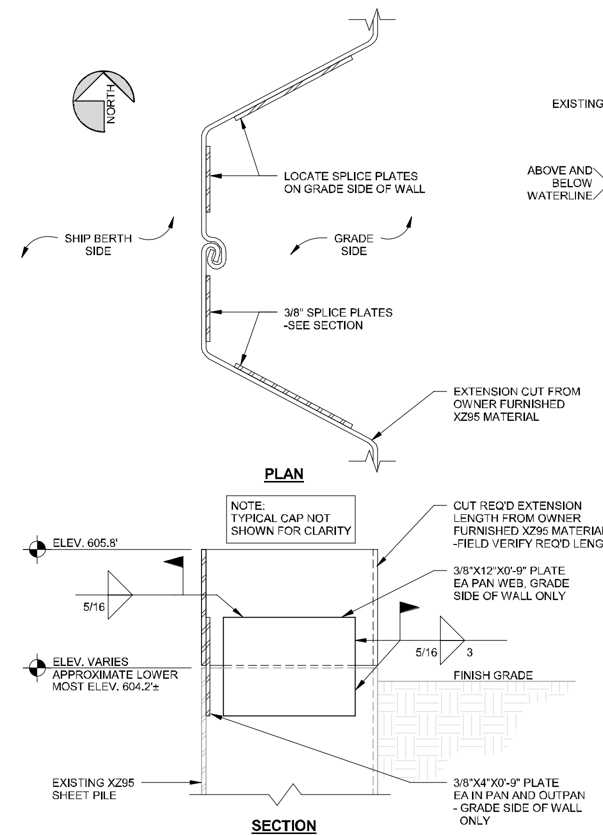
4 S501 ANCHOR TO EXISTING SHEET PILE SECTION
1 1/2" = 1'-0"



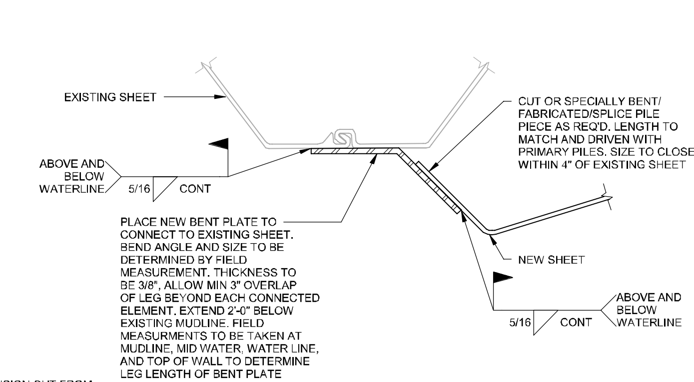
5 S501 TYPICAL SKZ25 IN-PAN/ANCHOR
1 1/2" = 1'-0"



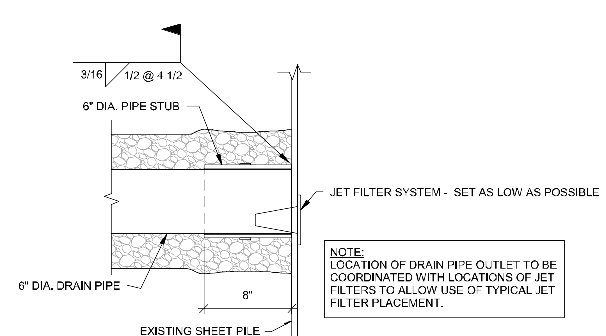
6 S501 ANCHOR TO EXISTING SHEET PILE
1 1/2" = 1'-0"



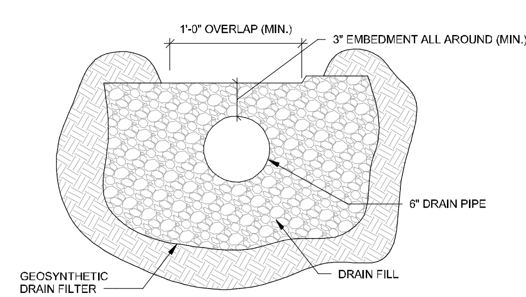
7 S501 EXISTING XZ95 EXTENSION
1 1/2" = 1'-0"



8 S501 TYPICAL NEW/EXISTING SHEET CONNECTION DETAIL
1 1/2" = 1'-0"



9 S501 DRAIN TILE OUTLET DETAIL
1 1/2" = 1'-0"



10 S501 DRAIN TILE INSTALLATION
1 1/2" = 1'-0"

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Revision Schedule

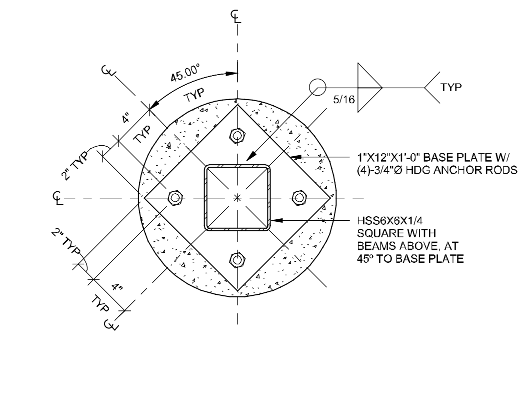
Date	#	Description	By

GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

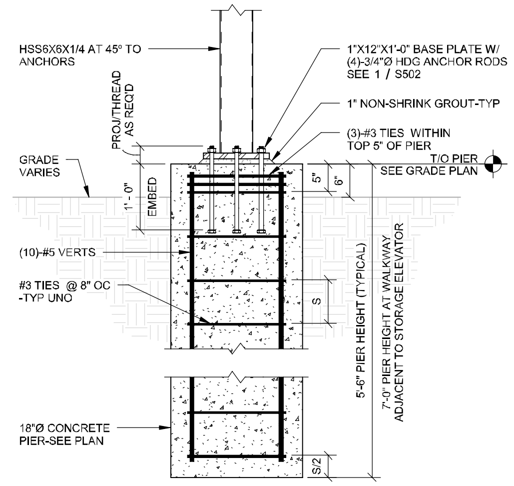
SECTIONS & DETAILS

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: WDK/JTF
CHECKED BY: LBL/CJP

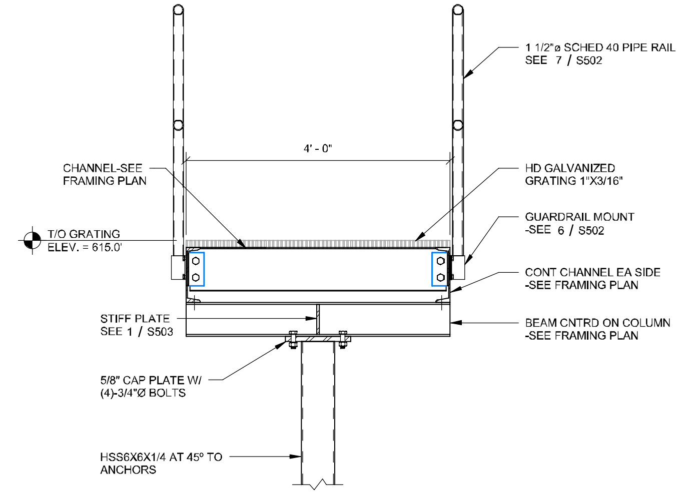
SHEET:
S501



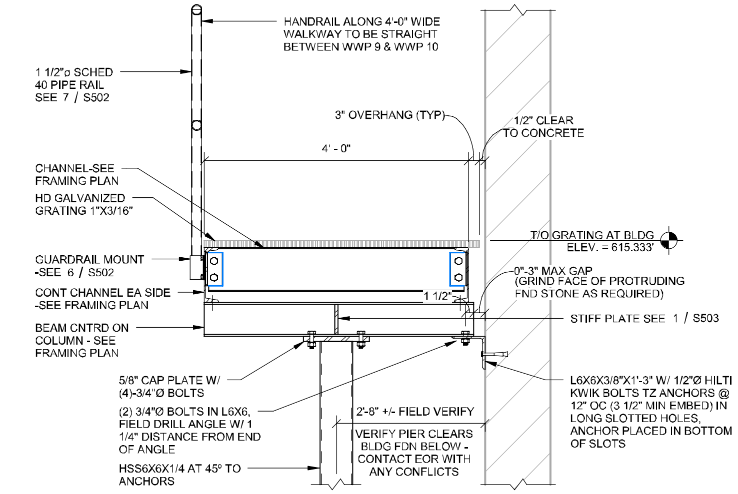
1 TYPICAL COLUMN BASE PLATE/PIER DETAIL
S502 1 1/2" = 1'-0"



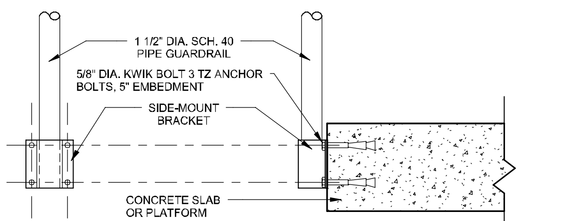
2 TYPICAL COLUMN TO PIER DETAIL
S502 3/4" = 1'-0"



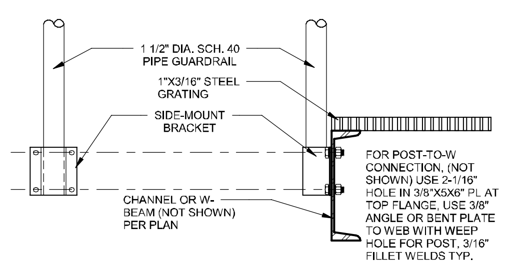
3 TYPICAL CATWALK FRAMING DETAIL
S502 3/4" = 1'-0"



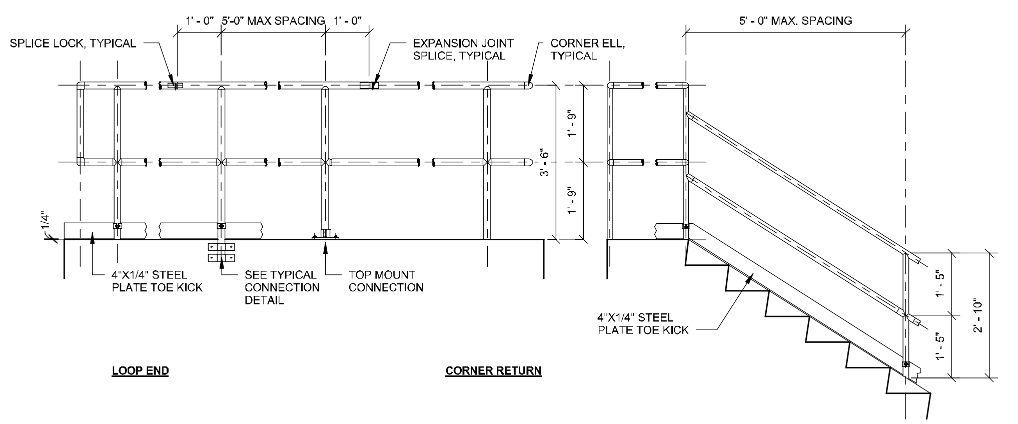
4 TYPICAL CATWALK FRAMING AT EXIST BUILDING
S502 3/4" = 1'-0"



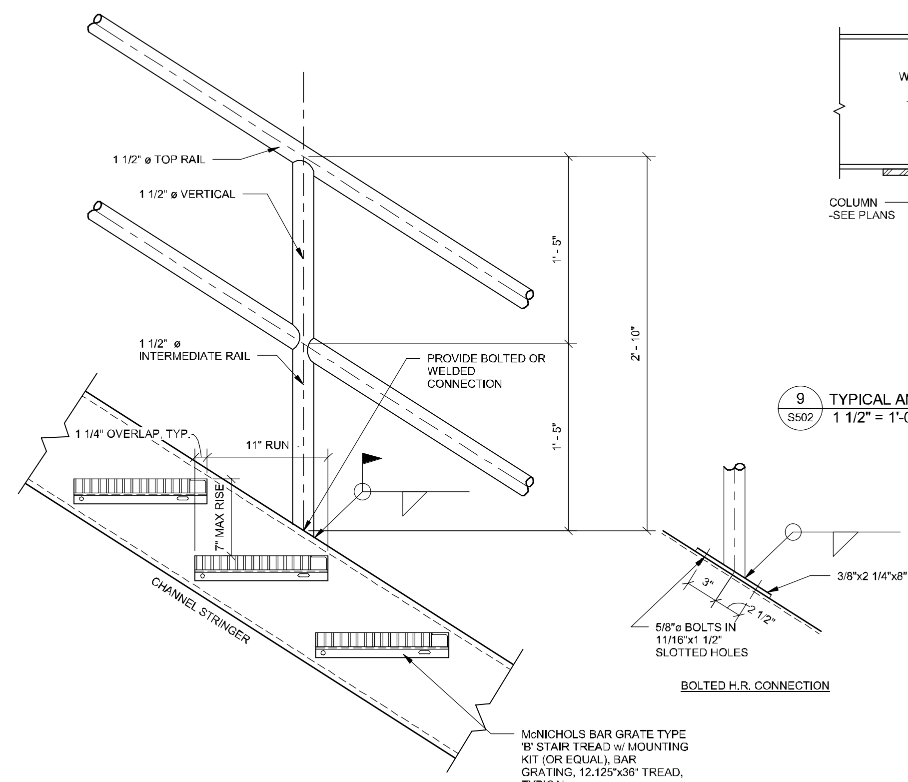
5 GUARDRAIL MOUNT @ CONC. SLAB
S502 1 1/2" = 1'-0"



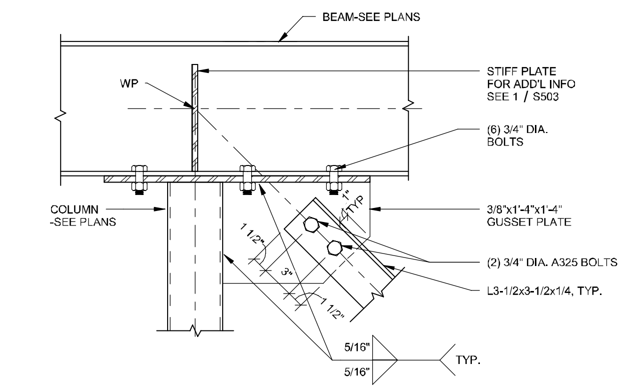
6 GUARDRAIL MOUNT @ SIDE OF BEAM
S502 1 1/2" = 1'-0"



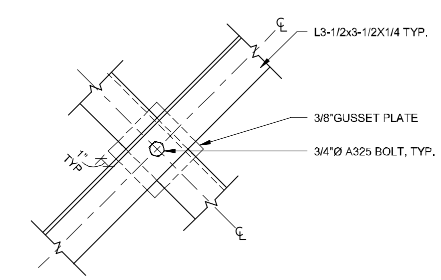
7 TYPICAL FIXED GUARDRAIL DETAILS
S502 1/2" = 1'-0"



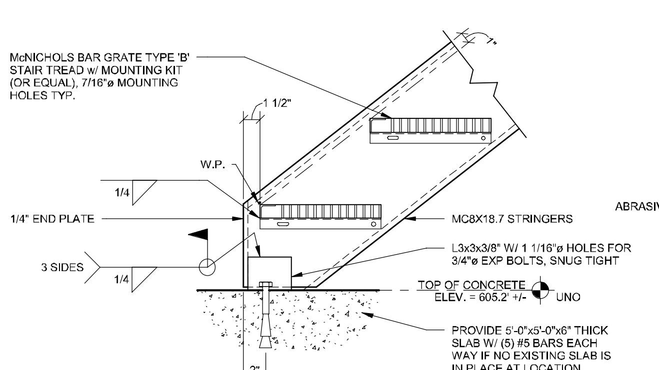
8 TYPICAL STAIR STRINGER, TREAD & HANDRAIL DETAIL
S502 1 1/2" = 1'-0"



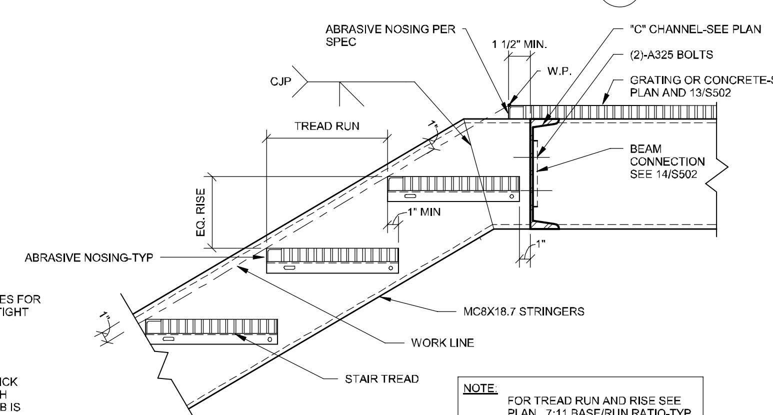
9 TYPICAL ANGLE BRACE CONNECTION
S502 1 1/2" = 1'-0"



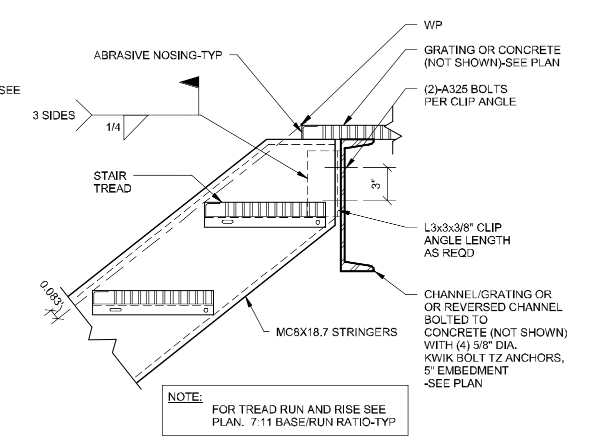
10 TYPICAL CROSS BRACE DETAIL
S502 1 1/2" = 1'-0"



11 TYPICAL BOTTOM STRINGER CONNECTION @ SLAB
S502 1 1/2" = 1'-0"

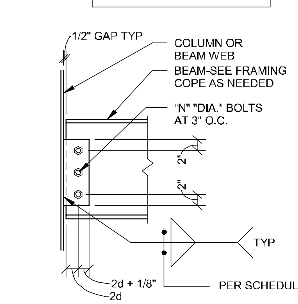


12 TYPICAL BROKEN BACK STAIR STRINGER CONNECTION
S502 1 1/2" = 1'-0"



13 TYPICAL TOP STRINGER CONNECTION TO CHANNEL OR CONCRETE
S502 1 1/2" = 1'-0"

NOTE:
VERIFY ORIENTATION AND/OR BEAM BOTH SIDES-SEE PLAN



BEAM TO COLUMN OR BEAM WEB

"N"	CHANNEL (C) OR BEAM SIZE	SHEAR PLATE OR ANGLE TH	BOLT DIA.	FILLET WELD SIZE
2	C OR W8 - W10	3/8"	3/4"ø	1/4"
3	C OR W12 - W14	3/8"	3/4"ø	1/4"
4	W16	3/8"	3/4"ø	1/4"

NOTE:
1. AT SINGLE PLATE WELDED BOLTED SHEAR CONNECTIONS, USE THIS TABLE TO DETERMINE NUMBER, DIAMETER & SPACING OF BOLTS, SHEAR PLATE THICKNESS, AND FILLET WELD SIZE.
2. BOLTS SHALL BE A325X TYP UNO.
3. ALL PLATES TO HAVE STANDARD SHORT SLOTTED HOLES (SSLT) UNO.

14 TYPICAL SHEAR PLATE CONNECTION TABLE
S502 N.T.S.

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WISCONSIN LAURAN B. LARSON E-28805 EAU CLAIRE, WI PROFESSIONAL ENGINEER

Date	#	Revision Schedule Description	By

GENERAL MILLS SUPERIOR DOCK REHAB
SUPERIOR, WI
SECTIONS & DETAILS

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: WDK/JTF
CHECKED BY: LBL/CIP
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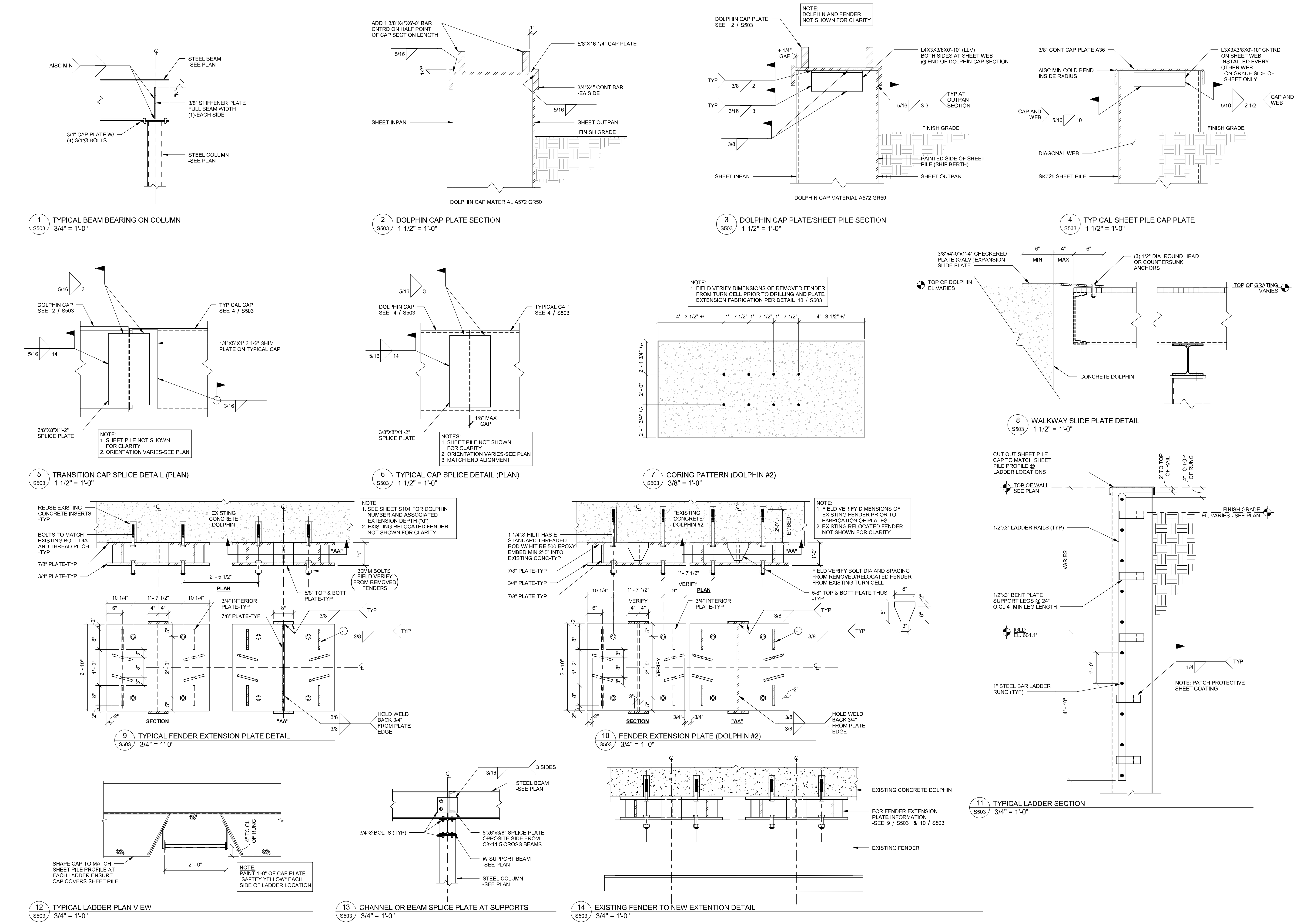
S502



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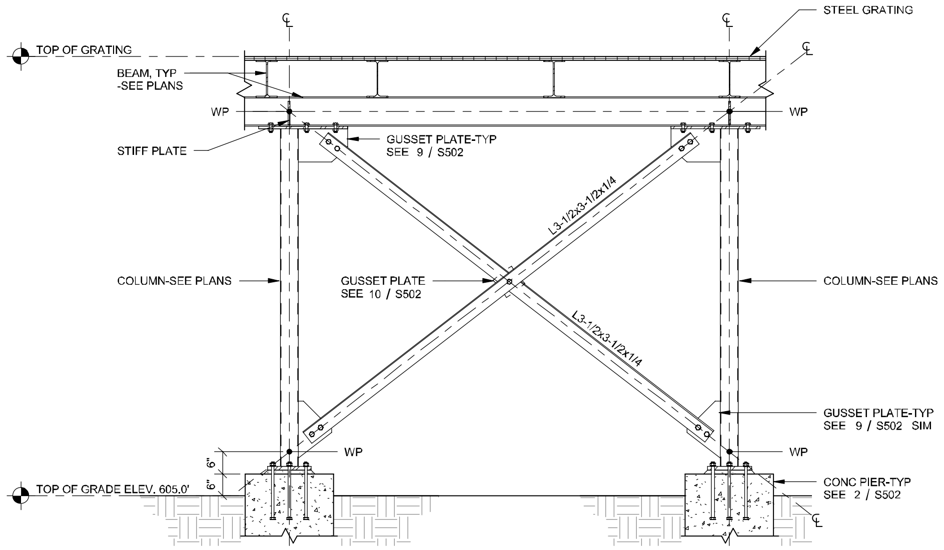
SUPERIOR, WI

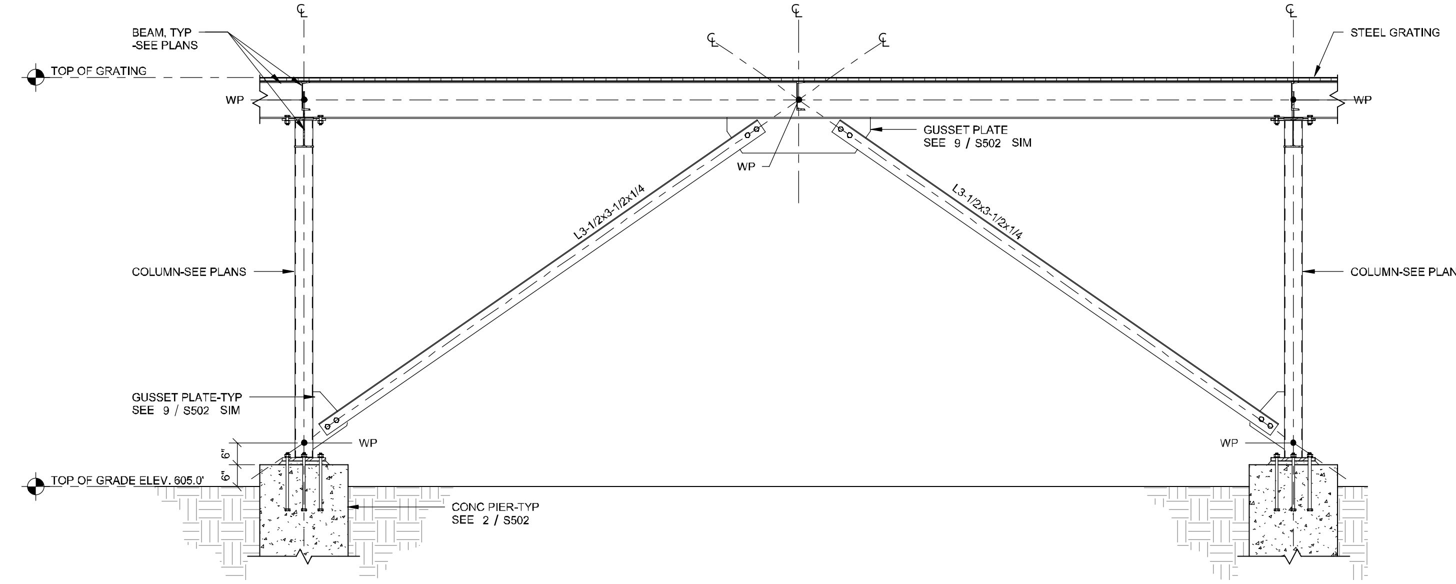
SECTIONS & DETAILS

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: WDK/JTF
CHECKED BY: LBL/CIP

SHEET:
S503



1 / S504 TYPICAL X-BRACING SECTION
1/2" = 1'-0"



2 / S504 TYPICAL CHEVRON BRACING SECTION
1/2" = 1'-0"

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Date	#	Revision Schedule Description	By

GENERAL MILLS
SUPERIOR DOCK REHAB
SUPERIOR, WI

SECTIONS & DETAILS

JOB No: 122248
DATE: 03.04.2013
DRAWN BY: WDK/JTF
CHECKED BY: LBL/CIP
SHEET:
S504

multiple sections of sheet pile were driven at a 45-degree angle into the lakebed within the slip to serve as buttress members and support the top of the sheet pile wall.

Lastly, a smaller wall failure and patch was imaged between Stations 9+05 and 9+30. This 25-ft section of wall appears to have failed in shallow water allowing only a limited volume of fill material to flow into the slip. The patch was comprised of a section of sheet pile driven vertically to brace multiple horizontal boards to function as a weir. Existing in 3 ft of water (4.5 ft at the time of the survey), neither sonar system was able to image a significant portion of the patch. The section of wall between the two patches did appear to be in relatively good physical condition. However, this section should be considered structurally compromised and subject to further evaluation given the damage on either end, and lack of supplemental support or buttressing.

4. GENERAL MILLS SLIP RESULTS

The General Mill Slip is located at the confluence of St. Louis Bay to the northwest and Howards Bay to the east. The slip is situated on the western side of the General Mills Dock, which currently supports numerous grain elevators operated by General Mills. Historical documents indicate that the General Mills Dock dates back to the late 1880s. It was originally utilized as a coal dock by Northwestern Fuel Co., then converted to an oil transfer and storage depot between the 1930s and 1970s. On the western margin of the slip stands the submerged ruins of a Great Northern Dock, which was reportedly abandoned in the 1960s and now consists of a remnant (deadhead) piling field within a shallow embayment (Sigma Group 2019a,c). The ruins of the Great Northern Dock reside south of the coal dock and conveyor system on the eastern side of the Midwest Energy Resources Dock.

The General Mills Slip is approximately 1,800 ft long and extends 500 ft south of the 1880s historical shoreline for this portion of Superior. Upland material was excavated and removed as part of construction of the General Mills Dock and/or Great Northern Dock (Sigma Group 2019a). Therefore, sediments residing at the sediment-water interface in the southern limits of the slip would be expected to be representative of Holocene sediments that have accumulated over the last 140 years, while the deeper strata would be more indicative of upland soils and geology.

4.1 Bathymetry

The General Mills Slip survey area was comprised of the 7.4-acre parcel of submerged lands between the General Mills Dock to the east and ruins of the Great Northern Dock to the west, plus 6.7 acres of coverage that extended into South Channel and St. Louis Bay (Figure A-15). When corrected and referenced to the LWD for Lake Superior, water depths within the confines of the slip ranged from 2 ft in the extreme southeastern corner and southwestern margin of the coverage area to 38 ft at the center of a discrete scour feature near the centerline of the slip. An overall average water depth of 24 ft existed in the majority of the slip, while the waters in South Channel (north of the docks) were considerably deeper.

Similar to the bottom morphology within the confines of the other slips surveyed as part of the site characterization effort, water depths within the General Mills Slip were shallower at the headwaters (ranging from 3 to 18 ft), then gradually increased and eventually reached the maximum value at the mouth of the slip. The western margins of the multibeam survey captured the toe of the dredged slip and a narrow portion of the shoal that supported the pilings associated with the former Great Northern Dock (Figure A-16). The survey also detected two, similarly shaped bottom depressions along the centerline of the slip. Each feature was approximately 85 ft long in the north-south axis and several feet deeper than the surrounding bottom. Based on their locations relative to the docks, as well as their morphology, these bottom scours may be associated with propeller wash from ships entering and exiting the General Mills facility.

Outside of the slip, water depths corrected to LWD exhibited a range of 2 ft at the northern end of the General Mills Dock, increasing to 40 ft within the South Channel in the northwestern quadrant of coverage (Figure A-17). The shallow water noted at the end of the dock is part of a 500-ft-long, complex shoal that extends across the mouth of next slip. The deepest water in the coverage area (40 ft) was measured within a trough feature that exists in the South Channel. The authorized depth of the South Channel is 27 ft below LWD, which is maintained via dredging within the depositional environment of St Louis Bay (U.S. Army Corps of Engineers 2021). Although only a portion of the trough was included in the survey coverage, the bottom feature does not appear to represent an element of the dredged channel. When evaluated relative to surrounding infrastructure, the morphology of the trough aligns with the sailing line of bulk carriers approaching and disembarking from the Midwest Energy Resources coal dock facility. Therefore, this trough appears to have been produced and maintained by propeller wash and the repeated displacement of sediments by the loaded coal-carriers maneuvering into and out of the Midwest Energy Resources Dock.

The eastern limits of the survey displayed the margins of a shoal with a minimum depth of 2 ft and limiting access to the east side of the General Mills Dock to only smaller, shallow draft vessels (Figure A-17). The eastern slip was not part of the study area, but the National Oceanic and Atmospheric Administration navigation chart for Duluth-Superior Harbor indicates water depths of only 1 to 2 ft LWD along the length of the of the General Mills Dock, with an accretional mudflat exposed during low water conditions. Information presented in a historical records review indicated the eastern side of the General Mills Dock was once utilized as a railroad right-of-way connecting Superior and Duluth by crossing St Louis Bay via a single-track trestle system and two mid-channel swing bridges (Sigma Group 2019a). The trestles and swing bridge over the South Channel were decommissioned and removed in the mid-1980s, but the bathymetric feature that supported the trestle remains in place and may now be enhancing deposition and fostering the accretion of sediment between General Mills Dock and the Globe Elevators dock to the east.

When the survey data were presented as lakebed elevations relative to IGLD85, the bottom features within the General Mills Slip and adjacent areas displayed the same basic morphology but were referenced to a different vertical plane (Figure A-18). As would be expected, the lowest elevations (560 ft) corresponded to the large trough feature northeast of the Midwest Energy Resources Dock. The highest elevations were documented along a ridge of sediment to the west of the slip that represents the ruins of the Great Northern Dock (599 ft), as well as the shoal of material at the northeastern limits of the survey area.

4.2 Sub-bottom Profiling

Sub-bottom profiling data were collected over 10 north-south oriented transects established within the 180-ft-wide General Mills Slip survey area. Similar to the other slips surveyed as part of this investigation, the acoustic profiles displayed evidence of multiple, distinct sediment strata within the upper sediment column. In general, fine-grained, lower density sediments (silts) with thicknesses ranging from 1 to 4 ft were found over intervals of mixed or chaotic layers of material. These mixed strata were 2 to 6 ft thick and commonly comprised of intervals of sand or sand mixed with silts and clays. The parent sediment was determined to be a homogenous, fine sand that resided below the localized disturbances caused by construction activity or repeated dredging to maintain suitable water depths for vessels utilizing the General Mills Dock.

In general, the sub-bottom returns collected in the northern portion of the of the survey area were relatively consistent in terms of penetration and characteristics of the material encountered. The sonar documented recently deposited, low-density silts over intervals of sand and sandy silts several feet thick. Only minor differences in the thickness of the fine-grained sediment overburden and the depth of sediment disturbance/mixing were identified. In contrast, the acoustic profiles collected in the southern reaches of the survey area displayed a distinct difference in sonar penetration relative to the northern reaches. Approximately 400 ft north of the slip headwaters, the lakebed formed a shelf, and a distinct sub-bottom reflector was encountered several feet below the sediment-water interface (Figure A-19). The reflector was buried beneath 2 to 4 ft of fine-grained, low-density sediment that the low-frequency acoustic pulses could readily penetrate. However, once through the silt overburden, the acoustic pulses encountered a sharp increase in sediment density. The density interface caused the majority of the acoustic energy emitted by the profiler to be reflected back into the water column, impeding further penetration into the sediment column.

As stated above, the southern extents of the General Mills Slip were excavated out of the upland soils when the slip was first constructed in late 1880s. The change in the basement material that was identified along each transect by the sub-bottom profiler appeared to correspond to the limits of the pre-construction (1860s) St. Louis Bay shoreline. As a result, the material beneath that sharp sub-bottom horizon was likely comprised of dense, compacted soils that were exposed during the excavation versus lakebed sediments. Sediment cores ND20-GM01 and GM02 were collected over this same area and provided some additional insight to the lakebed composition. Core GM01 was located in the southwest corner of the survey area and met refusal after collecting 4.2 ft of silt that resided over the harder substrate. Core GM02 was advanced nearly 10 ft and captured intervals silt and sand in the upper sediment column until encountering a dense, very fine sand at the bottom of the core. Detailed core logs for all locations sampled as part of the General Mills Slip site assessment are presented in Appendix C.

Elsewhere within the General Mill Slip, the sub-bottom profiler penetrated 10 to 15 ft into the lakebed sediments. Along the western extents of the survey area, the depth of disturbance appeared to range from 2 to 5 ft (Figure A-19). There was no distinct reflector below the disturbed material, suggesting the parent material resided directly beneath the disturbed sediment horizon and was homogenous. Multiple sediment cores (ND20-GM01, GM 03, GM06, GM08, GM10, and GM12) were obtained along the western margin of the survey area and indicated the upper sediment column was comprised of a mix of silts and sands. The penetration depths for all cores were less than 10 ft, providing limited insight into the deeper strata comprising the parent material.

With the exception of modest differences in bathymetry associated with the dredged ship berth, sedimentary conditions along the centerline and eastern side of the General Mills Slip were analogous to those along the western side (Figures A-20 and A-21). A fine-grained surface deposit associated with recent deposition was noted over much of the surveyed area. This veneer of material ranged in thickness from 1 to 4 ft depending upon location within the slip and the frequency of disturbance by vessels mooring to and departing from the General Mills Dock. Sediment cores collected near the centerline (ND20-GM02, GM04, GM05, GM07, GM09, and GM11) consistently displayed deposits of silt over very fine sand. All core penetration depths were less than 10 ft. However, based on the lakebed morphology at the sampling locations, the cores samples were able to characterize the sediment column to elevations between 561 and 576 ft IGLD85. Dense, very fine sand was captured in the bottom of each core obtained near the centerline regardless of the actual lakebed elevation that was ultimately sampled. These findings suggest the cores were sampling the parent material underlying the General Mills Slip, which was comprised of this very fine sand.

5. TOWER AVENUE SLIP RESULTS

The Tower Avenue Slip is located in Howards Bay and bounded by the Paper Calmenson Dock to the west and Cenex Harvest State Cooperatives (CHS) Dock to the east. The northeast-southwest orientation of the slip differs from the other slips included within the investigation. The slip was constructed in the late 1880s and early 1890s, following the 1880s shoreline and morphology of Tower Bay, ultimately minimizing the volume of upland soils that required removal. The construction required the formation of quay walls along the natural banks of Tower Bay and placement of fill material on the submerged lands of the state. In addition, the natural sediments of Tower Bay were removed by dredging the southwestern extents and infilling of a creek that conveyed runoff from what is now the Billings Park section of Superior. Upon completion, dock space was created on both sides of the bay to provide cargo transfer, bulk storage and industrial space to accommodate the rapidly increasing commerce within Superior Harbor (Sigma Group 2019b).

Coal was stockpiled on the Paper Calmenson Dock on the west side of Tower Slip in the 1890s, which was eventually replaced by steel storage, ship repair, and ultimately heavy equipment storage. Once the dock space on the east side was established, it was used extensively for small to mid-sized manufacturing, including iron works, smelting and refining industries, bulk material (sand, gravel, stone, coal, and salt) storage, and handling of various building materials up until 1940 (Sigma Group 2019b). By 1941, the Farmers' Union Grain Terminal grain elevators were constructed on what is now the CHS Dock. The elevators were originally owned by Farmers' water line appears to have been cast in place with steel binders embedded in the pour and used to hold adjoining sections together. Spalling and the gradual erosion of the concrete by rainwater over time may have caused several of those binders to be displaced and come to rest in the sediments at the foot of the wall. One such binder was clearly visible in both the side-scan sonar and MBES imagery at Station 0+50, resting at a 45-degree angle with one end in the sediments and the other suspended in the water column by the timber framing.

Besides the obvious deterioration of the concrete cap between Stations 0+00 and 1+50, there were also some indications of fill material loss into the slip, suggesting existing or prior breaches in the wall. The survey data displayed the southwestern half of a sediment mound at Station 0+00. Although more attributable to shoreline erosion and deposition in the waterway than an existing wall breach, the feature remains noteworthy as the northwestern limit of the wall cap may be experiencing some undermining as material is washed into the slip as runoff. Sediment accumulations of various size and age were also detected along the base of the wall at Stations 0+50, 1+00, and 1+20, again suggesting potential breaches in the wall below the waterline.

Between Stations 1+50 and 2+40 the concrete cap displayed less evidence of deterioration and the support structure under the waterline appeared to be intact. No accumulation of sediment or fill was noted, suggesting no loss of fill material into the slip. A deflection in the timber crossmember was captured in the side-scan imagery at Station 1+35, but not readily detected by the MBES system.

From Station 2+40 to the limits of sonar coverage the concrete cap and structural components below the waterline appeared relatively intact. Erosion and spalling were evident on the concrete sections above the waterline, but less severe than what was identified between Stations 0+00 and 1+50. The sediment-water interface showed little indication of any accumulation of material, suggesting no discharge of fill material into the slip. One rectangular opening was observed at the end of the wall and imaged by both surface photographs and the side-scan sonar. The overall purpose of the structure was unknown, but the side-scan data suggested it was a blind opening with a solid wall approximately 7 ft inside the dock. Another large outfall in combination with a short sheet pile wing wall was observed at Station 3+55 beyond the limit of sonar coverage, but its purpose was unknown.

6. SUMMARY OF FINDINGS

Geophysical surveying efforts, including precision multibeam bathymetric, sub-bottom profiling, and an acoustic dock wall survey, were conducted prior to sediment sampling to establish a basemap of the project area. In addition, the completion of these efforts provided the water depths, bottom elevations, and apparent sediment thickness data necessary for evaluations of the volumes of sediment that could be removed as part of future remediation efforts. The multibeam bathymetric and sub-bottom profiling surveys were completed in the Hallet Dock 8 Slip, Oil Barge Dock Slip, General Mills Slip, and Tower Avenue Slip. However, the dock wall acoustic surveys were only completed within the Oil Barge Dock and Tower Avenue Slips.

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These evaluations utilized various forms of remote sensing, which in turn produced high-resolution base maps of water depth and lakebed elevation for each slip surveyed. In addition, these data were used to develop a DEM suitable for the creation of a site model within a GIS environment. Additionally, the geophysical effort included the completion of underwater acoustic imagery surveys of the quay walls within the Oil Barge Dock and Tower Avenue Slips. These images of the submerged components of each wall were merged with corresponding digital photographs of the above water portions of each wall to support a first order assessment of conditions and stability of these structures.

Ultimately, these geophysical data sets data will be used in conjunction with chemical analytical data to evaluate initial extents of sediment contamination as described below. They are sufficiently robust for use as part of future feasibility studies or to serve as the basis of remedial design evaluations. Key findings from each area are summarized below.

6.1 Hallet Dock 8 Slip

The Hallet Dock 8 slip is currently 140 wide and 2,400 ft long, with the southern limits of the slip corresponding to the relic (1890) shoreline. When corrected and referenced to the LWD for Lake Superior (601.1 ft), water depths within the slip ranged from 10 ft in the extreme southeastern corner to 37 ft near the northeastern corner of the Hallet Dock 8. In general, the sub-bottom data were representative of a disturbed or modified bed with multiple, discontinuous strata visible in the top 15 to 20 ft of penetration.

6.2 Oil Barge Dock

The Oil Barge Slip is currently an 840-ft-long and 95-ft-wide slip that resides between the BP Oil Dock and Midwest Energy Resources Dock. The Oil Barge Dock Slip survey area was comprised of the 2-acre parcel of submerged lands between the eastern and western walls, as well as 4.8 acres of coverage that extended into St. Louis Bay. Multibeam bathymetry data were collected from the approximate centerline of South Channel to the limits of navigation in the headwaters to the south. Shallow water and debris (timbers associated with a failing bulkhead) prevented access and complete coverage of the water body. Minimum water depths of 3 ft were detected in the southeastern limits of coverage, while a maximum water depth of 25 ft was measured at the entrance to the slip near the centerline.

Sub-bottom profiling data were collected over 10 north-south oriented survey transects within the 95-ft-wide BP Oil Barge Dock Slip. Similar to the Hallet Dock 8 Slip, the sediment column displays evidence of a significantly disturbed or modified bed with several discontinuous strata visible in within 15 to 20 ft of the sediment-water interface. Three principal material types, each with unique acoustic signatures that were a product of either physical composition and/or degree of disturbance, were detected within sediment column. Recently deposited fine-grained sediments (silts) overlying mixed or chaotic layers of material were noted in the upper sediment column, while bedded, homogenous parent sediments (silty clays) were found at depth within the profile. The thickness of each type of material encountered varied significantly based on location within the slip, bathymetry, degree of anthropogenic influence, and structural integrity of the adjacent walls.

In general, the west wall between Stations 0+00 and 1+20 appeared intact but displayed signs of damage and deterioration both above and below the waterline. The east wall is the product of different construction techniques employed in different timeframes. As a result, the condition of the wall segments at the time of the survey was directly dependent upon the construction technique employed, the material used, and the age of each segment.

Additional investigation of stability by means of divers or ROV and potential mitigation measures would be recommended during future evaluations of potential remedial actions in this area.

6.3 General Mills Slip

The General Mill Slip is located at the confluence of St. Louis Bay to the northwest and Howards Bay to the east. The General Mills Slip is approximately 1,800 ft long and extends 500 ft south of the 1880s historical shoreline for this portion of Superior. The General Mills Slip survey area was comprised of the 7.4-acre parcel of submerged lands between the General Mills Dock to the east and ruins of the Great Northern Dock to the west, plus 6.7 acres of coverage that extended into South Channel and St. Louis Bay (Figure A-15). When corrected and referenced to the LWD for Lake Superior, water depths within the confines of the slip ranged from 2 ft in the extreme southeastern corner and southwestern margin of the coverage area to 38 ft at the center of a discrete scour feature near the centerline of the slip.

Sub-bottom profiling data were collected over 10 north-south oriented transects established within the 180-ft-wide General Mills Slip survey area. Similar to the other slips surveyed as part of this investigation, the acoustic profiles displayed evidence of multiple, distinct sediment strata within the upper sediment column. In general, fine-grained, lower density sediments (silts) with thicknesses ranging from 1 to 4 ft were found over intervals of mixed or chaotic layers of material. These mixed strata were 2 to 6 ft thick and commonly comprised of intervals of sand or sand mixed with silts and clays. The parent sediment was determined to be a homogenous, fine sand that resided below the localized disturbances caused by construction activity or repeated dredging to maintain suitable water depths for vessels utilizing the General Mills Dock.

6.4 Tower Avenue Slip

The Tower Avenue Slip is located in Howards Bay and bounded by the Paper Calmenson to the west and CHS docks to the east. The Tower Avenue Slip survey area covered 16.9 acres of submerged lands within the confines of the slip, as well as 8.7 acres of coverage that extended into Howards Bay. The Tower Avenue Slip extends approximately 2,770 ft from Howards Bay into the headwaters before terminating at an earthen berm and several outfall structures in various states of repair. Access to the slip from Howards Bay appears to be restricted to a relatively narrow, 300-ft-wide passage between a shallow embayment to the west exhibiting depths ranging from 4 to 20 ft and the CHS dock to the east. Once the Paper Calmenson Dock is

LIST OF FIGURES

LIST OF FIGURES (continued)

ATTACHMENTS

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Legend

Water Depth (Feet)

Sediment Characterization and Survey Area (39.50 ac)

Water Depth (Feet)

40.5

0.5

Notes:
Ordinary High Water (OHW) = 603.1 (IGLD85 Feet)
Low Water Datum (LWD) = 601.1 (IGLD85 Feet)

Figure A-15

Water Depth (Entire coverage area)

General Mills Slip

North End District and Clough Island
Superior, Wisconsin

Map Date: 6/3/2021
Source: Google Earth 05/2017
Projection: NAD 1983 State Plane Wisconsin North US Foot

EA

\\wovetongis\GISdata\Federal\Midwest\Wisconsin\NorthEndDistrict_CloughIsland_15982011\MXD\Site Investigation Report\NorthEnd_Superior\Figure A-15 Water Depth – Water Depth (Entire coverage area) General Mills Slip

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Legend

Water Depth (Feet)

Sediment Characterization and Survey Area (39.50 ac)

Water Depth (Feet)

40.5

0.5

Figure A-16
Water Depth Southern Extents (Exhibit 1)
General Mills Slip
North End District and Clough Island
Superior, Wisconsin

Map Date: 6/3/2021
Source: Google Earth 05/2017
Projection: NAD 1983 State Plane
Wisconsin North US Foot

Notes:
Ordinary High Water (OHW) = 603.1 (IGLD85 Feet)
Low Water Datum (LWD) = 601.1 (IGLD85 Feet)

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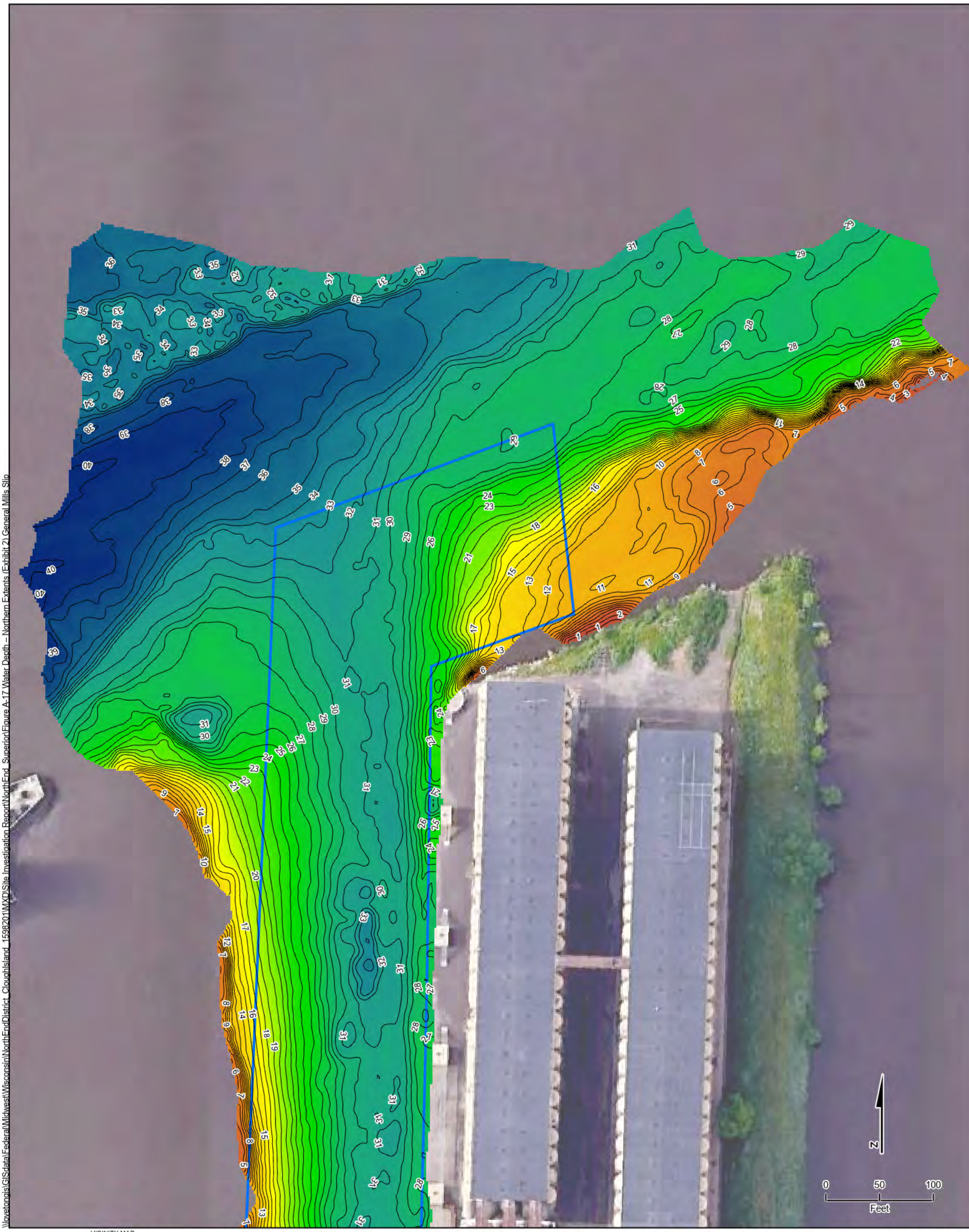

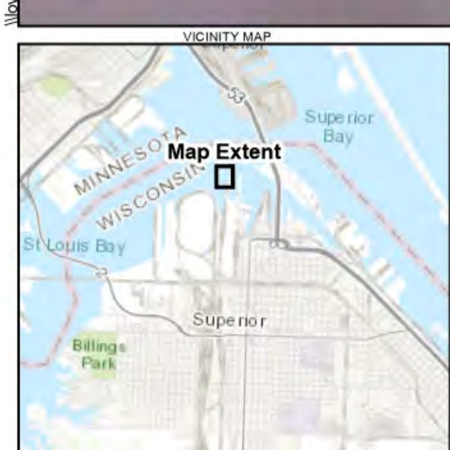

Legend

Water Depth (Feet)

Sediment Characterization and Survey Area (39.50 ac)

Water Depth (Feet)

40.5

0.5

Figure A-17
Water Depth Northern Extents (Exhibit 2)
General Mills Slip
North End District and Clough Island
Superior, Wisconsin

Map Date: 6/3/2021
Source: Google Earth 05/2017
Projection: NAD 1983 State Plane Wisconsin North US Foot

Notes:
Ordinary High Water (OHW) = 603.1 (IGLD85 Feet)
Low Water Datum (LWD) = 601.1 (IGLD85 Feet)

Legend

Elevation Contour (IGLD85 Feet)

Sediment Characterization and Survey Area (39.50 ac)

Elevation (IGLD85 Feet)

600.5

561.5

Figure A-18
Lakebed Elevation
General Mills Slip
North End District and Clough Island
Superior, Wisconsin

Map Date: 2/24/2021
Source: Google Earth 05/2017
Projection: NAD 1983 State Plane
Wisconsin North US Foot

Notes:
Ordinary High Water (OHW) = 603.1 (IGLD85 Feet)
Low Water Datum (LWD) = 601.1 (IGLD85 Feet)

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General Mills Slip - West

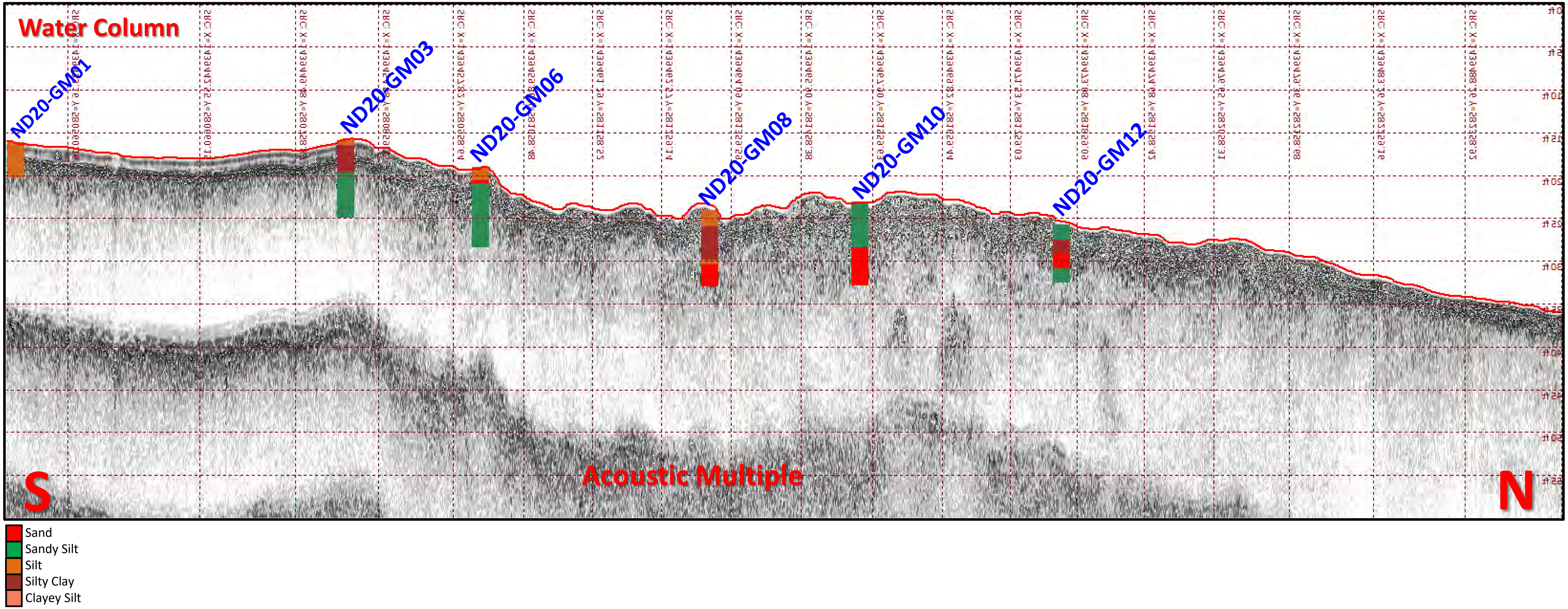

Figure A-19. Acoustic sub bottom profile of the sediment column along the western margin of the General Mills Slip. The acoustic image was reversed to allow presentation of survey transect from south (left) to north (right) orientation consistent with adjacent survey lines to improve inter-comparability. Core GM01 was located in the southwest corner of the survey area and met refusal after collecting 4.2 ft of silt, while the remaining cores indicated the upper sediment column was comprised of a mix of silts and sands. Detailed core logs for Locations ND20-GM01 through GM12 are presented in Appendices B and C.

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General Mills Slip - Centerline

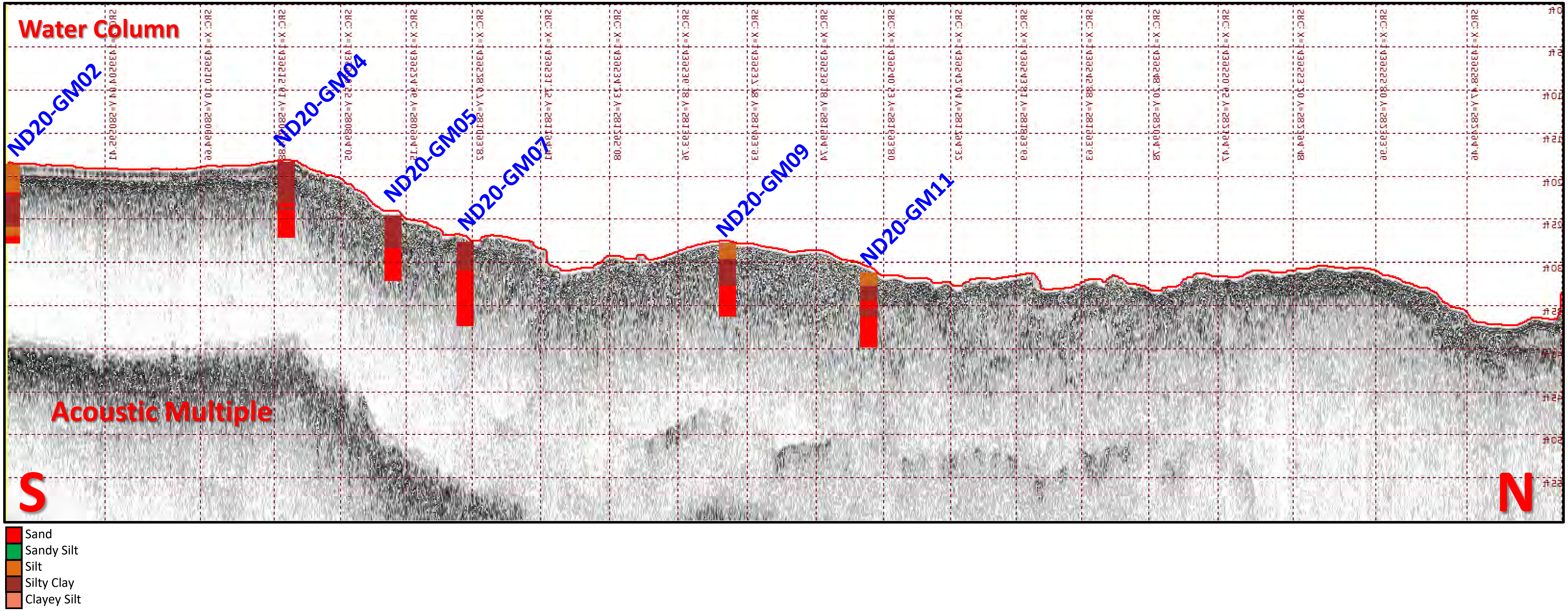

Figure A-20. Acoustic sub bottom profile of the sediment column along the centerline of the General Mills Slip. The acoustic image was reversed to allow presentation of survey transect from south (left) to north (right) orientation consistent with adjacent survey lines to improve inter-comparability. Sediment cores GM-02 through GM 11 displayed deposits of silt over very fine sand in the upper sediment column. In addition, dense, very fine sand was captured in the bottom of each core obtained near the centerline, suggesting the cores were contacting the parent material. Detailed core logs for Locations ND20-GM02 through GM11 are presented in Appendices B and C.

General Mills Slip - East

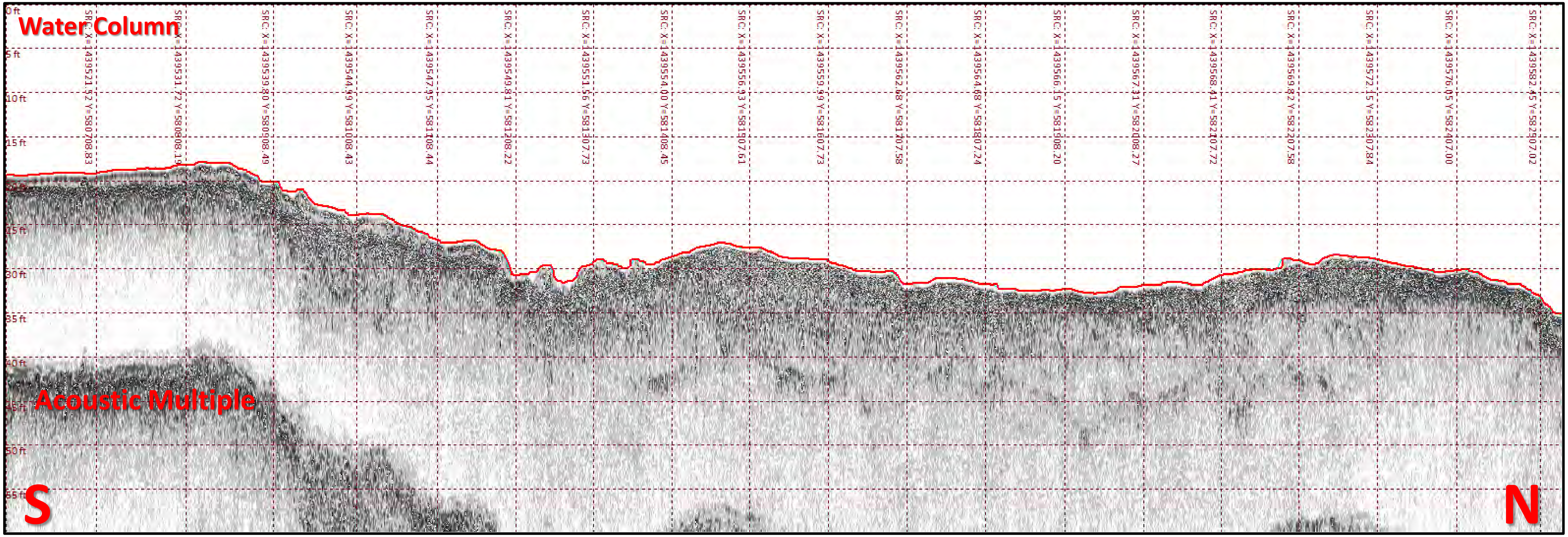

Figure A-21. Acoustic sub bottom profile of the sediment column along the eastern margin of the General Mills Slip. A 1 to 4 ft thick veneer of fine-grained surface deposit (mottled appearance) associated with recent deposition was noted over much of the surveyed area, with the surface layer thickness dependent upon location within the slip and the frequency of disturbance by vessels mooring to and departing from the General Mills Dock.

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Appendix C.3

2022 Sediment Sampling Logs and Index Test Results

BORING NUMBER 2022-GT-GM-01

AECOM

TOTAL DEPTH 10 FT BGS

CLIENT Wisconsin Department of Natural Resources
PROJECT NAME Superior Slips WDNR
PROJECT NUMBER 60685299
SITE NAME General Mills Slip
DATE STARTED 07/27/2022 **COMPLETED** 07/27/2022
SURVEYING BY Affiliated Researchers
DRILLING CONTRACTOR Affiliated Researchers
ON 7/27/2022 **GROUND ELEVATION** 585.21 ft
DRILLING EQUIPMENT Russfelder P3
EASTING 145550.74 **NORTHING** 312587.13
DRILLING METHOD Vibracore
HOLE DIAMETER 0.25 ft
LOGGED BY KinnardH **CHECKED BY** KD/AB
CASING TYPE N/A

DEPTH (ft)	SAMPLE ID	RECOVERY %	PID (ppm)	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation (ft msl)
0–1			0		0.00 Organic soil with SAND (OL), 5-15% very fine sand, <10% angular, fine gravel, coal and roots - brown, wet - no odor, no staining - cohesive, very soft	585.2
1–2			0			
2–3			0			
3–4			0			
4–5	2022-GT-GM-01 (4-5.3)	60	0		4.00 Silty SAND (SM), very fine, well-graded, 25-35% silt - light brown, moist - no odor, no staining - non-cohesive, very dense	581.2
5–6			0			
6–7.5			0			
7.5–10					7.50 Silty SAND (SM), very fine, well-graded, 25-35% silt. light brown, moist.	577.7

Refusal at 10.0 feet.
Bottom of borehole at 10 feet.

AECOM SMART LOG_W SAMPLE ID - NANAIMO LOGS_DC.GPJ - 9/14/22 23:16 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINTCL\PROJECTS\WDNR-BORE LOGS-PULL 6-REV.GPJ

BORING NUMBER 2022-GT-GM-02

AECOM

TOTAL DEPTH 6.2 FT BGS

CLIENT Wisconsin Department of Natural Resources		**PROJECT NAME** Superior Slips WDNR	
PROJECT NUMBER 60685299		**SITE NAME** General Mills Slip	
DATE STARTED 07/27/2022	**COMPLETED** 07/27/2022	**SURVEYING BY** Affiliated Researchers	
DRILLING CONTRACTOR Affiliated Researchers		**ON** 7/27/2022	**GROUND ELEVATION** 574.18 ft
DRILLING EQUIPMENT Russfelder P3		**EASTING** 145548.87	**NORTHING** 313279.85
DRILLING METHOD Vibracore		**HOLE DIAMETER** 0.25 ft	
LOGGED BY KinnardH	**CHECKED BY** KD/AB	**CASING TYPE** N/A	

DEPTH (ft)	SAMPLE ID	RECOVERY %	PID (ppm)	GRAPHIC LOG		MATERIAL DESCRIPTION	Elevation (ft msl)
0							
0–1	2022-GT-GM-02 (2-3.5)	77	0		0.00	Organic soil (OL), <10% very fine sand and roots - brown, wet - no odor, no staining - cohesive, very soft	574.2
1–2			0				
2–3			0		2.50	- increased sand content (15%), becoming soft at 2.5 ft	571.7
3–4			0				
4–5			0				
5–6.2	2022-GT-GM-02 (5-6)		0		5.00	Silty SAND (SM), very fine, well-graded, 25-35% silt - light brown, moist - no odor, no staining - non-cohesive, very dense	569.2

Refusal at 6.2 feet.
Bottom of borehole at 6.2 feet.

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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SUMMARY OF DETECTION

Project: 60685299 T.6 SUPERIOR SLIPS

Pace Project No.: 40249166

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
~~**40249166002**~~	~~**2022-GT-OB-01(5-6.5)**~~					
~~ASTM D6913/D7928~~	~~Hydrometer 8 Passing~~	~~6.4~~	~~%~~		~~08/05/22 19:41~~	
~~Lloyd Kahn~~	~~Total Organic Carbon~~	~~15200~~	~~mg/kg~~	~~1730~~	~~08/09/22 04:38~~	~~M0~~
~~**40249166003**~~	~~**2022-GT-OB-02(5-6.5)**~~					
~~ASTM D2974-87~~	~~Percent Moisture~~	~~29.1~~	~~%~~	~~0.10~~	~~08/04/22 12:00~~	
~~ASTM D6913/D7928~~	~~Sieve 3.0"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 2.0"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 1.5"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 1.0"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 0.75"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 0.375"~~	~~96.6~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #4~~	~~96.2~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #10~~	~~95.5~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #20~~	~~92.7~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #40~~	~~88.9~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #60~~	~~86.7~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #100~~	~~85.3~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #140~~	~~84.1~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #200~~	~~81.9~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 1 Passing~~	~~69.5~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 2 Passing~~	~~60.5~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 3 Passing~~	~~55.1~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 4 Passing~~	~~38.8~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 5 Passing~~	~~33.3~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 6 Passing~~	~~26.5~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 7 Passing~~	~~22.9~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 8 Passing~~	~~15.2~~	~~%~~		~~08/05/22 19:41~~	
~~Lloyd Kahn~~	~~Total Organic Carbon~~	~~23600~~	~~mg/kg~~	~~1970~~	~~08/09/22 04:54~~	
40249166004	**2022-GT-GM-01(4-5.3)**					
ASTM D2974-87	Percent Moisture	38.2	%	0.10	08/04/22 12:00	
ASTM D6913/D7928	Sieve 3.0"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 2.0"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 1.5"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 1.0"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 0.75"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 0.375"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #4	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #10	99.5	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #20	98.6	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #40	95.8	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #60	90.8	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #100	83.3	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #140	75.3	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #200	63.9	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 1 Passing	41.2	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 2 Passing	29.6	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 3 Passing	23.9	%		08/05/22 19:41	

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SUMMARY OF DETECTION

Project: 60685299 T.6 SUPERIOR SLIPS
Pace Project No.: 40249166

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40249166004	**2022-GT-GM-01(4-5.3)**					
ASTM D6913/D7928	Hydrometer 4 Passing	16.2	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 5 Passing	16.2	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 6 Passing	14.7	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 7 Passing	10.9	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 8 Passing	6.6	%		08/05/22 19:41	
Lloyd Kahn	Total Organic Carbon	43200	mg/kg	2140	08/09/22 05:10	
40249166005	**2022-GT-GM-02(2-3.5)**					
ASTM D2974-87	Percent Moisture	43.6	%	0.10	08/04/22 12:01	
ASTM D6913/D7928	Sieve 3.0"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 2.0"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 1.5"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 1.0"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 0.75"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 0.375"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #4	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #10	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #20	99.9	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #40	99.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #60	95.6	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #100	87.7	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #140	78.5	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #200	67.0	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 1 Passing	44.8	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 2 Passing	35.6	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 3 Passing	32.0	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 4 Passing	24.6	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 5 Passing	19.1	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 6 Passing	17.7	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 7 Passing	14.1	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 8 Passing	9.9	%		08/05/22 19:41	
Lloyd Kahn	Total Organic Carbon	26400	mg/kg	1900	08/09/22 05:16	
40249166006	**2022-GT-GM-02(5-6)**					
ASTM D2974-87	Percent Moisture	17.7	%	0.10	08/04/22 12:01	
ASTM D6913/D7928	Sieve 3.0"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 2.0"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 1.5"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 1.0"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 0.75"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve 0.375"	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #4	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #10	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #20	100.0	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #40	99.9	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #60	99.4	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #100	98.6	%		08/05/22 19:41	
ASTM D6913/D7928	Sieve #140	96.6	%		08/05/22 19:41	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: 60685299 T.6 SUPERIOR SLIPS
Pace Project No.: 40249166

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40249166006	**2022-GT-GM-02(5-6)**					
ASTM D6913/D7928	Sieve #200	89.6	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 1 Passing	61.2	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 2 Passing	45.2	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 3 Passing	31.0	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 4 Passing	15.0	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 5 Passing	11.9	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 6 Passing	10.1	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 7 Passing	8.3	%		08/05/22 19:41	
ASTM D6913/D7928	Hydrometer 8 Passing	6.1	%		08/05/22 19:41	
Lloyd Kahn	Total Organic Carbon	2210	mg/kg	628	08/09/22 05:21	
~~**40249166007**~~	~~**2022-GT-CS-01(0.5-2)**~~					
~~ASTM D2974-87~~	~~Percent Moisture~~	~~37.0~~	~~%~~	~~0.10~~	~~08/04/22 12:01~~	
~~ASTM D6913/D7928~~	~~Sieve 3.0"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 2.0"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 1.5"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 1.0"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 0.75"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 0.375"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #4~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #10~~	~~99.9~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #20~~	~~99.1~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #40~~	~~96.3~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #60~~	~~84.8~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #100~~	~~55.7~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #140~~	~~45.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #200~~	~~41.2~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 1 Passing~~	~~35.9~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 2 Passing~~	~~32.2~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 3 Passing~~	~~30.3~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 4 Passing~~	~~23.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 5 Passing~~	~~21.6~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 6 Passing~~	~~19.7~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 7 Passing~~	~~14.2~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Hydrometer 8 Passing~~	~~10.0~~	~~%~~		~~08/05/22 19:41~~	
~~Lloyd Kahn~~	~~Total Organic Carbon~~	~~25700~~	~~mg/kg~~	~~1620~~	~~08/09/22 05:26~~	
~~**40249166008**~~	~~**2022-GT-CS-02(1.2-2.8)**~~					
~~ASTM D2974-87~~	~~Percent Moisture~~	~~22.6~~	~~%~~	~~0.10~~	~~08/04/22 12:01~~	
~~ASTM D6913/D7928~~	~~Sieve 3.0"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 2.0"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 1.5"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 1.0"~~	~~100.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 0.75"~~	~~98.3~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve 0.375"~~	~~98.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #4~~	~~98.0~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #10~~	~~97.7~~	~~%~~		~~08/05/22 19:41~~	
~~ASTM D6913/D7928~~	~~Sieve #20~~	~~97.5~~	~~%~~		~~08/05/22 19:41~~	

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ANALYTICAL RESULTS

Project: 60685299 T.6 SUPERIOR SLIPS
Pace Project No.: 40249166

Sample: 2022-GT-GM-01(4-5.3) **Lab ID: 40249166004** Collected: 07/28/22 08:00 Received: 08/02/22 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Green Bay								
Percent Moisture	**38.2**	%	0.10	0.10	1		08/04/22 12:00		
ASTM D6913D7928 GrainsizeHydro	Analytical Method: ASTM D6913/D7928 Pace Analytical Services - Green Bay								
Sieve 3.0"	**100.0**	%			1		08/05/22 19:41		
Sieve 2.0"	**100.0**	%			1		08/05/22 19:41		
Sieve 1.5"	**100.0**	%			1		08/05/22 19:41		
Sieve 1.0"	**100.0**	%			1		08/05/22 19:41		
Sieve 0.75"	**100.0**	%			1		08/05/22 19:41		
Sieve 0.375"	**100.0**	%			1		08/05/22 19:41		
Sieve #4	**100.0**	%			1		08/05/22 19:41		
Sieve #10	**99.5**	%			1		08/05/22 19:41		
Sieve #20	**98.6**	%			1		08/05/22 19:41		
Sieve #40	**95.8**	%			1		08/05/22 19:41		
Sieve #60	**90.8**	%			1		08/05/22 19:41		
Sieve #100	**83.3**	%			1		08/05/22 19:41		
Sieve #140	**75.3**	%			1		08/05/22 19:41		
Sieve #200	**63.9**	%			1		08/05/22 19:41		
Hydrometer 1 Passing	**41.2**	%			1		08/05/22 19:41		
Hydrometer 2 Passing	**29.6**	%			1		08/05/22 19:41		
Hydrometer 3 Passing	**23.9**	%			1		08/05/22 19:41		
Hydrometer 4 Passing	**16.2**	%			1		08/05/22 19:41		
Hydrometer 5 Passing	**16.2**	%			1		08/05/22 19:41		
Hydrometer 6 Passing	**14.7**	%			1		08/05/22 19:41		
Hydrometer 7 Passing	**10.9**	%			1		08/05/22 19:41		
Hydrometer 8 Passing	**6.6**	%			1		08/05/22 19:41		
TOC via Lloyd Kahn	Analytical Method: Lloyd Kahn Pace Analytical Services - Green Bay								
Total Organic Carbon	**43200**	mg/kg	2140	1080	1		08/09/22 05:10	7440-44-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 60685299 T.6 SUPERIOR SLIPS
Pace Project No.: 40249166

Sample: 2022-GT-GM-02(2-3.5) **Lab ID: 40249166005** Collected: 07/28/22 07:45 Received: 08/02/22 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Green Bay								
Percent Moisture	**43.6**	%	0.10	0.10	1		08/04/22 12:01		
ASTM D6913D7928 GrainsizeHydro	Analytical Method: ASTM D6913/D7928 Pace Analytical Services - Green Bay								
Sieve 3.0"	**100.0**	%			1		08/05/22 19:41		
Sieve 2.0"	**100.0**	%			1		08/05/22 19:41		
Sieve 1.5"	**100.0**	%			1		08/05/22 19:41		
Sieve 1.0"	**100.0**	%			1		08/05/22 19:41		
Sieve 0.75"	**100.0**	%			1		08/05/22 19:41		
Sieve 0.375"	**100.0**	%			1		08/05/22 19:41		
Sieve #4	**100.0**	%			1		08/05/22 19:41		
Sieve #10	**100.0**	%			1		08/05/22 19:41		
Sieve #20	**99.9**	%			1		08/05/22 19:41		
Sieve #40	**99.0**	%			1		08/05/22 19:41		
Sieve #60	**95.6**	%			1		08/05/22 19:41		
Sieve #100	**87.7**	%			1		08/05/22 19:41		
Sieve #140	**78.5**	%			1		08/05/22 19:41		
Sieve #200	**67.0**	%			1		08/05/22 19:41		
Hydrometer 1 Passing	**44.8**	%			1		08/05/22 19:41		
Hydrometer 2 Passing	**35.6**	%			1		08/05/22 19:41		
Hydrometer 3 Passing	**32.0**	%			1		08/05/22 19:41		
Hydrometer 4 Passing	**24.6**	%			1		08/05/22 19:41		
Hydrometer 5 Passing	**19.1**	%			1		08/05/22 19:41		
Hydrometer 6 Passing	**17.7**	%			1		08/05/22 19:41		
Hydrometer 7 Passing	**14.1**	%			1		08/05/22 19:41		
Hydrometer 8 Passing	**9.9**	%			1		08/05/22 19:41		
TOC via Lloyd Kahn	Analytical Method: Lloyd Kahn Pace Analytical Services - Green Bay								
Total Organic Carbon	**26400**	mg/kg	1900	962	1		08/09/22 05:16	7440-44-0	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 60685299 T.6 SUPERIOR SLIPS
Pace Project No.: 40249166

Sample: 2022-GT-GM-02(5-6) **Lab ID: 40249166006** Collected: 07/28/22 07:45 Received: 08/02/22 10:20 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Green Bay								
Percent Moisture	**17.7**	%	0.10	0.10	1		08/04/22 12:01		
ASTM D6913D7928 GrainsizeHydro	Analytical Method: ASTM D6913/D7928 Pace Analytical Services - Green Bay								
Sieve 3.0"	**100.0**	%			1		08/05/22 19:41		
Sieve 2.0"	**100.0**	%			1		08/05/22 19:41		
Sieve 1.5"	**100.0**	%			1		08/05/22 19:41		
Sieve 1.0"	**100.0**	%			1		08/05/22 19:41		
Sieve 0.75"	**100.0**	%			1		08/05/22 19:41		
Sieve 0.375"	**100.0**	%			1		08/05/22 19:41		
Sieve #4	**100.0**	%			1		08/05/22 19:41		
Sieve #10	**100.0**	%			1		08/05/22 19:41		
Sieve #20	**100.0**	%			1		08/05/22 19:41		
Sieve #40	**99.9**	%			1		08/05/22 19:41		
Sieve #60	**99.4**	%			1		08/05/22 19:41		
Sieve #100	**98.6**	%			1		08/05/22 19:41		
Sieve #140	**96.6**	%			1		08/05/22 19:41		
Sieve #200	**89.6**	%			1		08/05/22 19:41		
Hydrometer 1 Passing	**61.2**	%			1		08/05/22 19:41		
Hydrometer 2 Passing	**45.2**	%			1		08/05/22 19:41		
Hydrometer 3 Passing	**31.0**	%			1		08/05/22 19:41		
Hydrometer 4 Passing	**15.0**	%			1		08/05/22 19:41		
Hydrometer 5 Passing	**11.9**	%			1		08/05/22 19:41		
Hydrometer 6 Passing	**10.1**	%			1		08/05/22 19:41		
Hydrometer 7 Passing	**8.3**	%			1		08/05/22 19:41		
Hydrometer 8 Passing	**6.1**	%			1		08/05/22 19:41		
TOC via Lloyd Kahn	Analytical Method: Lloyd Kahn Pace Analytical Services - Green Bay								
Total Organic Carbon	**2210**	mg/kg	628	317	1		08/09/22 05:21	7440-44-0	

TETRA TECH

DRY DENSITY AND MOISTURE CONTENT OF SHELBY TUBE SAMPLES - CALIPER METHOD

(WORKSHEET ONLY)

Client: Pace Analytical
Project: No. 40249166 (60685299 Superior Slips)
Tested By: RJP
Prepared By: Robert J Peeters
Reviewed By:

Date Tested: August 11-15, 2022
Date Reviewed:

Date Sampled: 7/28/22
Sample No. 40249166-004
Location: 2022-GT-GM-01
Depth: 4.0'-5.5'

Ww = Weight in Air-Wet (gms)
h = Average Height of Sample (inches)
d = Average Diameter of Sample (inches)
WD = Dry Weight of Sample (gms)
DW = Wet Density of Soil
V = Volume

Formula = $\frac{3.1416\ (r^2)\ h}{1728}$ = V

Formula = $\frac{Ww}{453.5924}$

Diameter	Height
2.643	4.469
2.675	4.445
2.646	4.421
2.690	4.390
2.657	4.453
Ave. Height	4.436
Ave. Diameter	2.662
Vol. Of Sample	0.01429
Area of Sample	5.5664

Wet Weight of Soil	gm	662.0
Dry Weight of Soil	gm	452.2
Loss	gm	209.8
Water Content	%	46.4
Wet Weight of Perm Sample	gm	662.0
Wet Soil in Pounds	lbs.	1.4595
Divided By Volume	pcf	102.1
Water Content	%	46.4
Dry Density	pcf	69.8

After Perm-Wet	gm	
After Perm-Dry	gm	
Loss	gm	
Water Content	%	
Dry Density	pcf	

Visual: SILT W/SAND, some organic fines, very dark brown

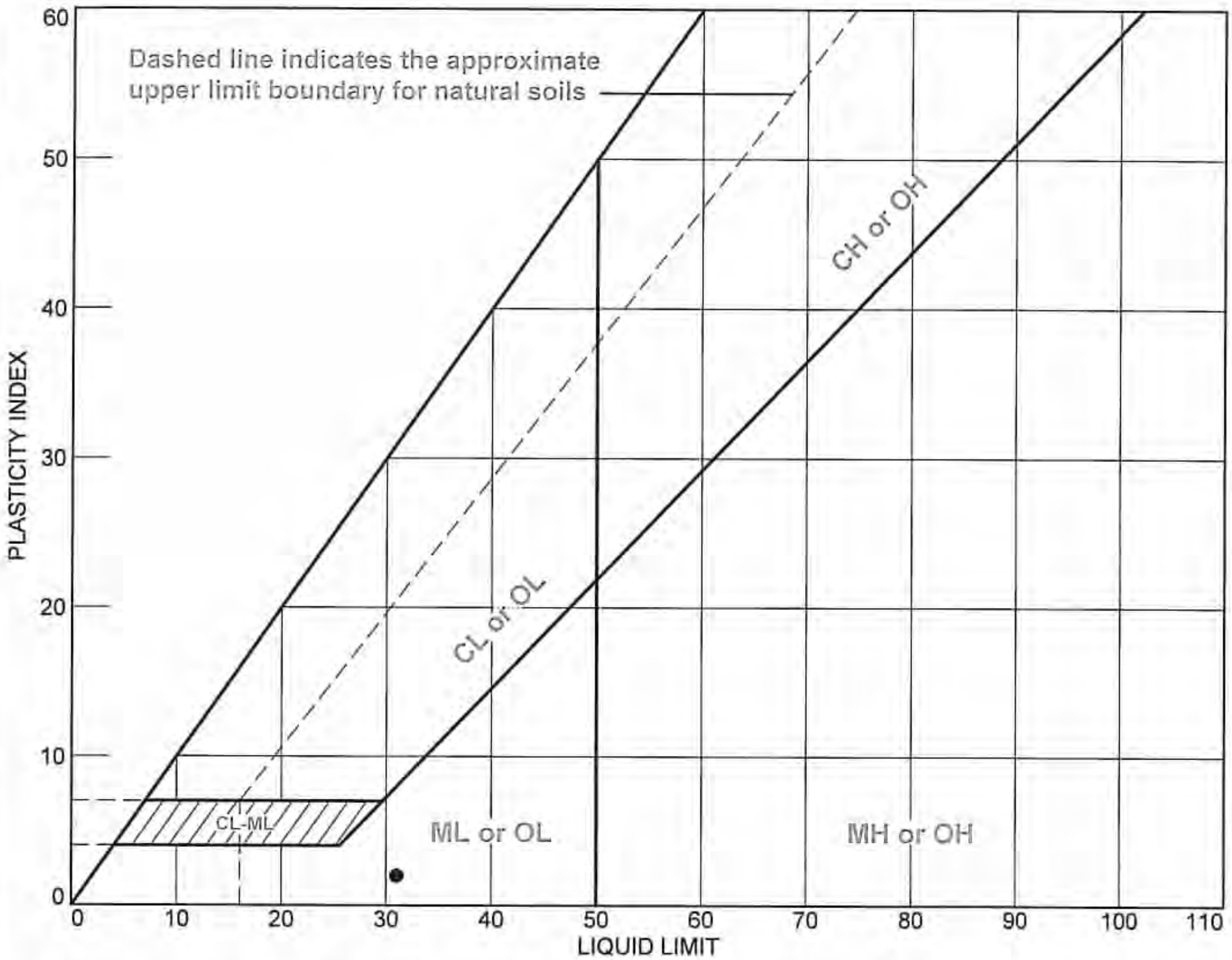
Munsell Color: 10YR 2/2

Lab Equipment:
Scale ID: DS #5
Micrometer ID: Lab S6

REVIEWED BY: Robert R Rouse

DATE REVIEWED: 8/25/22

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Borings	2022-GT-GM-01 (004)	4.0'-5.5'	46.4	29	31	2	

Tetra Tech **2679 Continental Drive** **Green Bay, WI 54311**	**Client:** Pace Analytical **Project:** 40249166 Superior Slips **Project No.:** **Figure**

Tested By: MLW **Checked By:** RJP

TETRA TECH

DRY DENSITY AND MOISTURE CONTENT OF SHELBY TUBE SAMPLES - CALIPER METHOD

(WORKSHEET ONLY)

Client: Pace Analytical
Project: No. 40249166 (60685299 Superior Slips)
Tested By: RJP
Prepared By: Robert J Peeters
Reviewed By:

Date Tested: August 10-12, 2022
Date Reviewed:

Date Sampled: 7/28/22
Sample No. 40249166-005
Location: 2022-GT-GM-02
Depth: 2.0'-3.5'

Ww = Weight in Air-Wet (gms)
h = Average Height of Sample (inches)
d = Average Diameter of Sample (inches)
WD = Dry Weight of Sample (gms)
DW = Wet Density of Soil
V = Volume

Formula = $\frac{3.1416\ (r^2)\ h}{1728}$ = V

Formula = $\frac{Ww}{453.5924}$

Diameter	Height
2.906	3.991
2.728	3.939
2.867	4.029
2.763	4.250
2.920	4.154
Ave. Height	4.073
Ave. Diameter	2.837
Vol. Of Sample	0.01490
Area of Sample	6.3205

Wet Weight of Soil	gm	675.2
Dry Weight of Soil	gm	457.5
Loss	gm	217.7
Water Content	%	47.6
Wet Weight of Perm Sample	gm	675.2
Wet Soil in Pounds	lbs.	1.4886
Divided By Volume	pcf	99.9
Water Content	%	47.6
Dry Density	pcf	67.7

After Perm-Wet	gm	
After Perm-Dry	gm	
Loss	gm	
Water Content	%	
Dry Density	pcf	

Visual: ORGANIC SANDY SILT, very dark brown

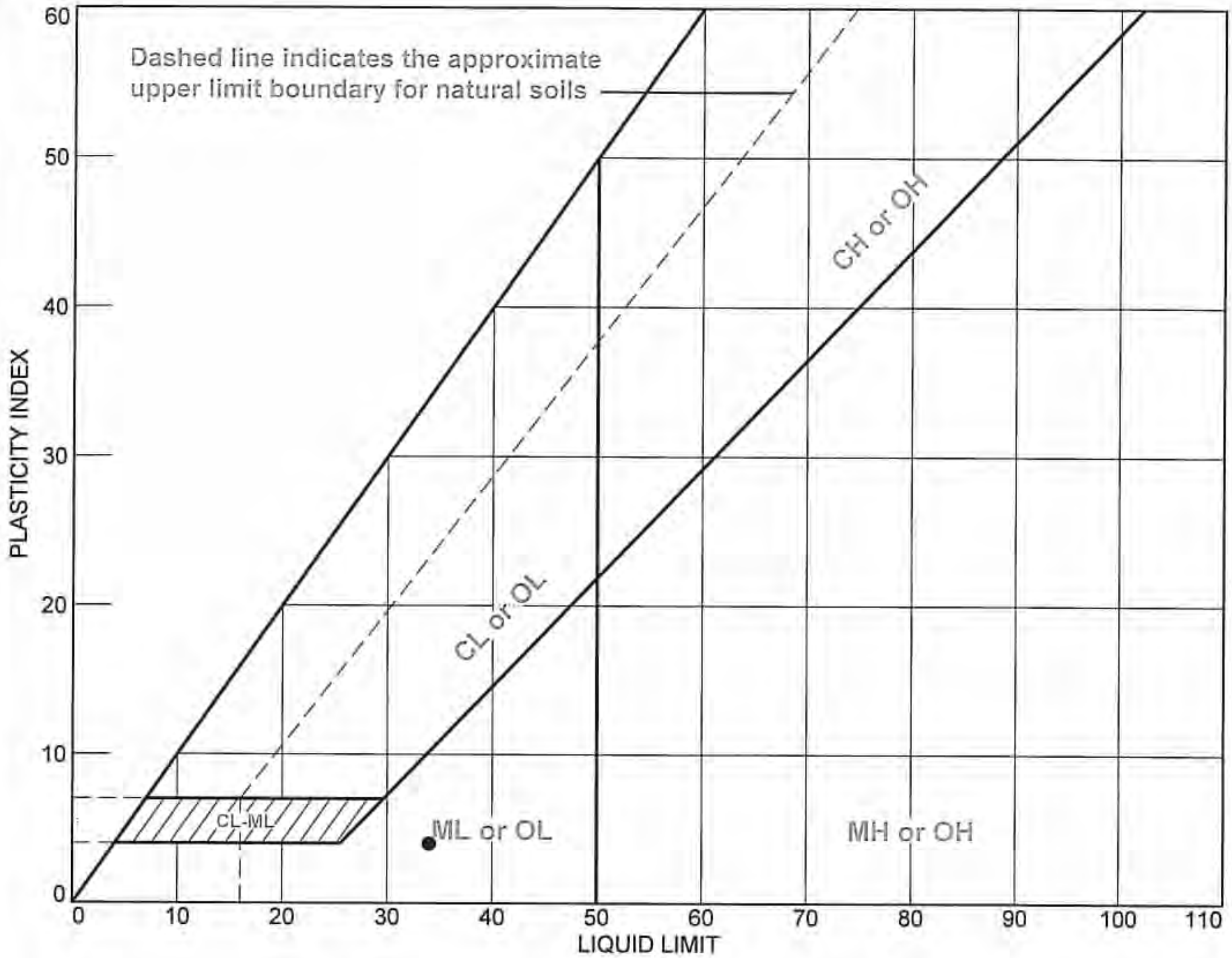
Munsell Color: 10YR 2/2

Lab Equipment:
Scale ID: DS #5
Micrometer ID: Lab S6

REVIEWED BY: Robert R Rouse

DATE REVIEWED: 8/25/22

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	Borings	2022-GT-GM-02 (005)	2.0'-3.5'	47.6	30	34	4	

Tetra Tech **2679 Continental Drive** **Green Bay, WI 54311**	**Client:** Pace Analytical **Project:** 40249166 Superior Slips **Project No.:** **Figure**

Tested By: MLW **Checked By:** RJP

TETRA TECH

DRY DENSITY AND MOISTURE CONTENT OF SHELBY TUBE SAMPLES - CALIPER METHOD

(WORKSHEET ONLY)

Client: Pace Analytical
Project: No. 40249166 (60685299 Superior Slips)
Tested By: RJP
Prepared By: Robert J Peeters
Reviewed By:

Date Tested: August 16-18, 2022
Date Reviewed:

Date Sampled: 7/28/22
Sample No. 40249166-006
Location: 2022-GT-GM-02
Depth: 5.0'-6.0'

Ww = Weight in Air-Wet (gms)
h = Average Height of Sample (inches)
d = Average Diameter of Sample (inches)
WD = Dry Weight of Sample (gms)
DW = Wet Density of Soil
V = Volume

Formula = $\frac{3.1416\ (r^2)\ h}{1728} = V$

Formula = $\frac{Ww}{453.5924}$

Diameter	Height
2.702	3.457
2.728	3.474
2.718	3.456
2.728	3.439
2.739	3.459
Ave. Height	3.457
Ave. Diameter	2.723
Vol. Of Sample	0.01165
Area of Sample	5.8235

Wet Weight of Soil	gm	679.5
Dry Weight of Soil	gm	568.7
Loss	gm	110.8
Water Content	%	19.5
Wet Weight of Perm Sample	gm	679.5
Wet Soil in Pounds	lbs.	1.4980
Divided By Volume	pcf	128.6
Water Content	%	19.5
Dry Density	pcf	107.6

After Perm-Wet	gm	
After Perm-Dry	gm	
Loss	gm	
Water Content	%	
Dry Density	pcf	

Visual: SILTY SAND, fine to medium grained, a little gravel, trace of organics, very dark grayish brown

Munsell Color: 10YR 3/2

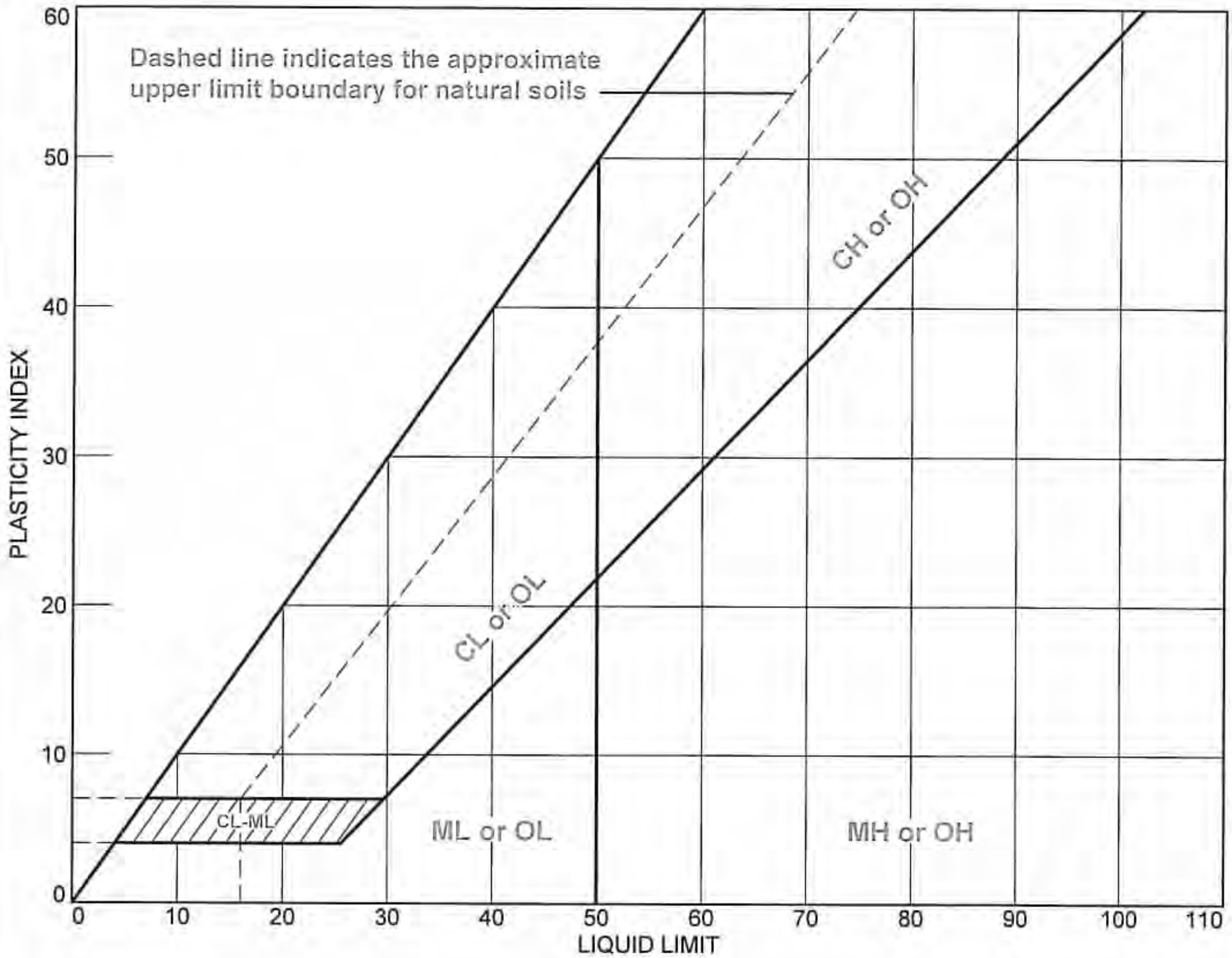
Lab Equipment:

Scale ID: DS #5
Micrometer ID: Lab S6

REVIEWED BY: Robert R Rouse

DATE REVIEWED: 8/25/22

LIQUID AND PLASTIC LIMITS TEST REPORT

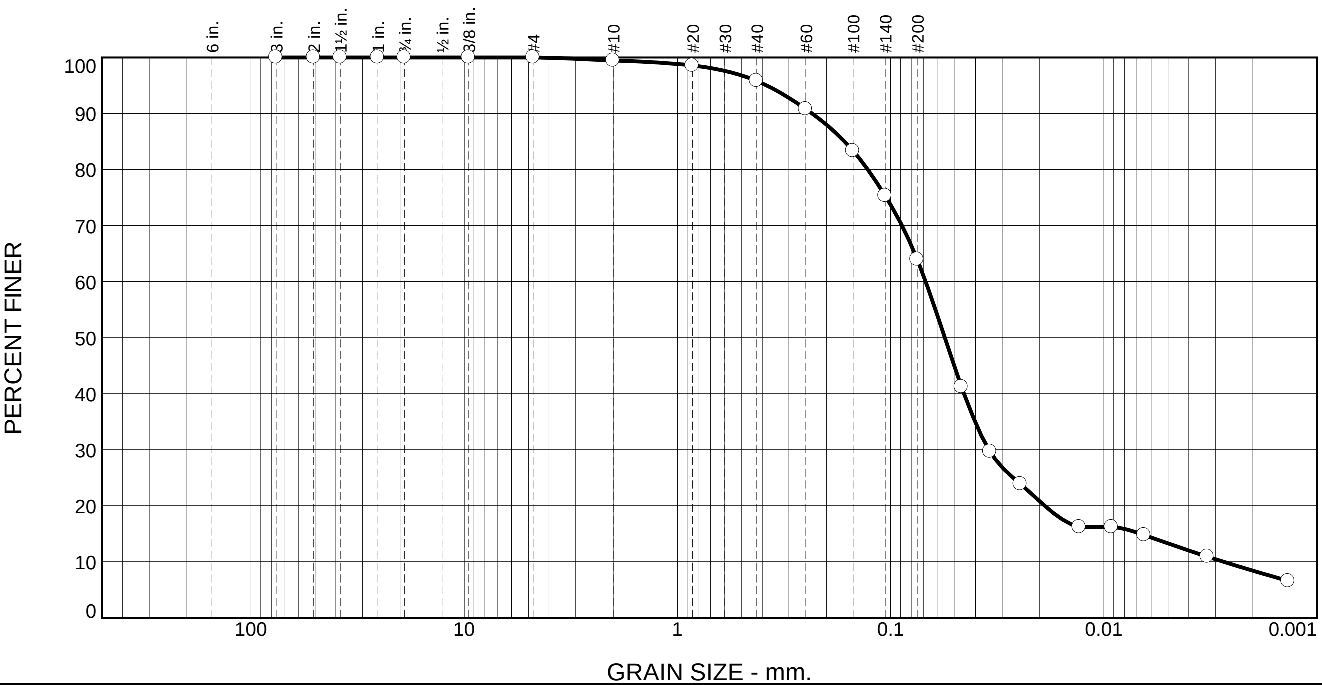


SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	Borings	2022-GT-GM-02 (006)	5.0'-6.0'	20.6	21	21	NP	

Tetra Tech **2679 Continental Drive** **Green Bay, WI 54311**	**Client:** Pace Analytical **Project:** 40249166 Superior Slips **Project No.:** **Figure**

Tested By: MLW **Checked By:** RJP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	3.7	31.9	50.6	13.3

TEST RESULTS (D7928 mod - With Hydrometer)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.75"	100.0		
0.375"	100.0		
#4	100.0		
#10	99.5		
#20	98.6		
#40	95.8		
#60	90.8		
#100	83.3		
#140	75.3		
#200	63.9		
0.0465 mm.	41.2		
0.0342 mm.	29.6		
0.0246 mm.	23.9		
0.0130 mm.	16.2		
0.0092 mm.	16.2		
0.0065 mm.	14.7		
0.0033 mm.	10.9		
0.0014 mm.	6.6		

* (no specification provided)

Material Description

manual description: standing water, silt, grainy, compact; roots, woodchips

geosystems description: sandy silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.2339 D_{85}= 0.1646 D_{60}= 0.0685
D_{50}= 0.0557 D_{30}= 0.0346 D_{15}= 0.0068
D_{10}= 0.0028 C_u= 24.86 C_c= 6.35

Remarks

Batch 47397, HBN 422694; coarse sieved 8/9/22, fine sieved 8/11/22; ethanol (#281100) used on sample to dissipate foam during hydrometer test; test assisted by LTT

Date Received: 8/2/22 **Date Tested:** 8/9/22

Tested By: Madeline Rohde and

Checked By: Donavon Sieloff

Title: Supervisor

Location: 2022-GT-GM-01(4-5.3)
Sample Number: 40249166-004
Date Sampled: 7/28/22

Pace Analytical Services, Inc.

Green Bay, WI

Client: AECOM, Inc. - Milwaukee
Project: 60685299 T.6 SUPERIOR SLIPS

Project No: 40249166 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

8/12/2022

Client: AECOM, Inc. - Milwaukee
Project: 60685299 T.6 SUPERIOR SLIPS
Project Number: 40249166
Location: 2022-GT-GM-01(4-5.3)
Sample Number: 40249166-004
Material Description: manual description: standing water, silt, grainy, compact; roots, woodchips
geosystems description: sandy silt
Sample Date: 7/28/22
Date Received: 8/2/22 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: ML **AASHTO Classification:** A-4(0)
Grain Size Test Method: D7928 mod - With Hydrometer
Testing Remarks: Batch 47397, HBN 422694; coarse sieved 8/9/22, fine sieved 8/11/22; ethanol (#281100) used on sample to dissipate foam during hydrometer test; test assisted by LTT
Tested By: Madeline Rohde and **Test Date:** 8/9/22
Checked By: Donavon Sieloff **Title:** Supervisor

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
776.13	587.14	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.75"	0.00	0.00	100.0
		0.375"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	1.02	0.00	99.5
51.70	0.00	#20	0.47	0.00	98.6
		#40	1.43	0.00	95.8
		#60	2.61	0.00	90.8
		#100	3.88	0.00	83.3
		#140	4.17	0.00	75.3
		#200	5.90	0.00	63.9

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 99.5
Weight of hydrometer sample =51.70
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -4
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 **-** 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.0	25.0	21.4	0.0133	25.0	12.2	0.0465	41.2
2.00	22.0	19.0	15.4	0.0133	19.0	13.2	0.0342	29.6
4.00	22.0	16.0	12.4	0.0133	16.0	13.7	0.0246	23.9
15.00	22.0	12.0	8.4	0.0133	12.0	14.3	0.0130	16.2
30.00	22.0	12.0	8.4	0.0133	12.0	14.3	0.0092	16.2
60.00	23.0	11.0	7.7	0.0132	11.0	14.5	0.0065	14.7
240.00	23.0	9.0	5.7	0.0132	9.0	14.8	0.0033	10.9
1440.00	22.0	7.0	3.4	0.0133	7.0	15.1	0.0014	6.6

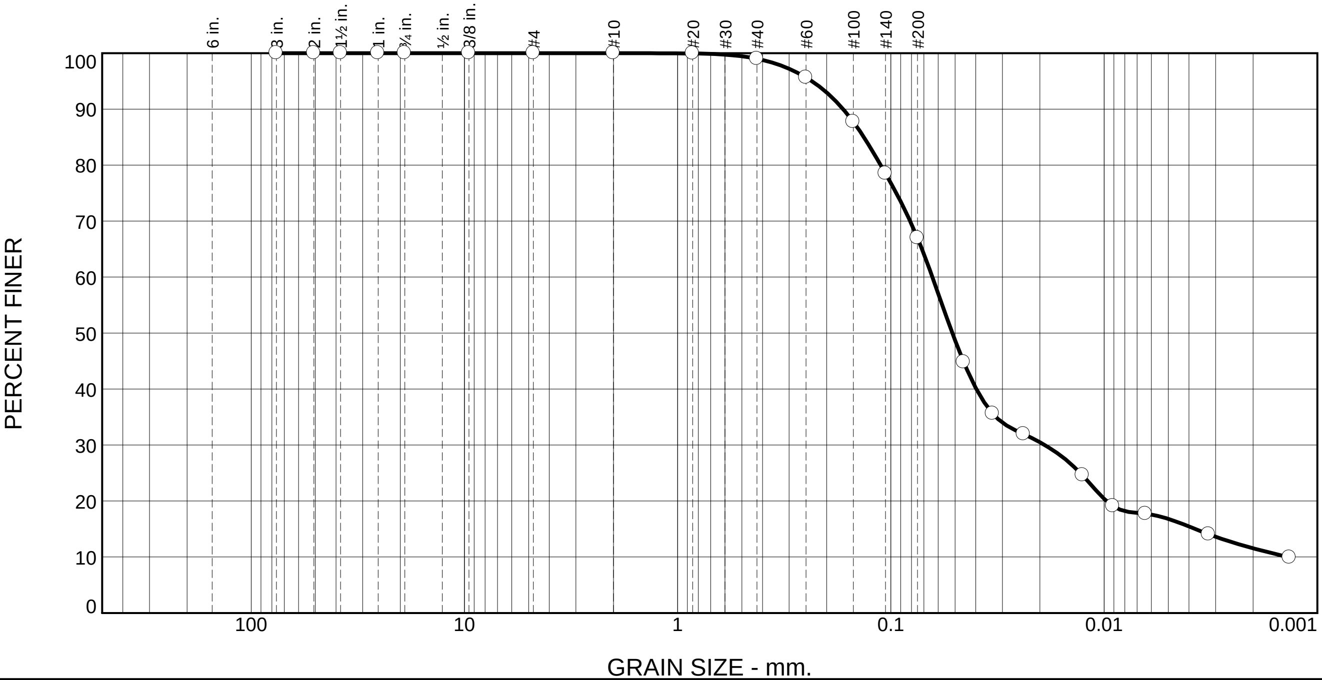
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.5	3.7	31.9	36.1	50.6	13.3	63.9

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0028	0.0068	0.0190	0.0346	0.0453	0.0557	0.0685	0.1281	0.1646	0.2339	0.3818

Fineness Modulus	C_u	C_c
0.28	24.86	6.35

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.0	32.0	50.2	16.8

TEST RESULTS (D7928 mod - With Hydrometer)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.75"	100.0		
0.375"	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.0		
#60	95.6		
#100	87.7		
#140	78.5		
#200	67.0		
0.0455 mm.	44.8		
0.0333 mm.	35.6		
0.0239 mm.	32.0		
0.0126 mm.	24.6		
0.0091 mm.	19.1		
0.0064 mm.	17.7		
0.0032 mm.	14.1		
0.0014 mm.	9.9		

* (no specification provided)

Material Description

manual description: standing water, silt, grainy, compact; roots, pebbles

geosystems description: sandy silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.1675 D_{85}= 0.1340 D_{60}= 0.0639
D_{50}= 0.0515 D_{30}= 0.0190 D_{15}= 0.0037
D_{10}= 0.0014 C_u= 46.47 C_c= 4.10

Remarks

Batch 47397, HBN 422694; coarse sieved 8/9/22, fine sieved 8/11/22; ethanol (#281100) used on sample to dissipate foam during hydrometer test; test assisted by LTT

Date Received: 8/2/22 **Date Tested:** 8/9/22

Tested By: Madeline Rohde and

Checked By: Donavon Sieloff

Title: Supervisor

Location: 2022-GT-GM-02(2-3.5)
Sample Number: 40249166-005

Date Sampled: 7/28/22

Pace Analytical Services, Inc.

Green Bay, WI

Client: AECOM, Inc. - Milwaukee
Project: 60685299 T.6 SUPERIOR SLIPS

Project No: 40249166 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

8/12/2022

Client: AECOM, Inc. - Milwaukee
Project: 60685299 T.6 SUPERIOR SLIPS
Project Number: 40249166
Location: 2022-GT-GM-02(2-3.5)
Sample Number: 40249166-005
Material Description: manual description: standing water, silt, grainy, compact; roots, pebbles
geosystems description: sandy silt
Sample Date: 7/28/22
Date Received: 8/2/22 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: ML **AASHTO Classification:** A-4(0)
Grain Size Test Method: D7928 mod - With Hydrometer
Testing Remarks: Batch 47397, HBN 422694; coarse sieved 8/9/22, fine sieved 8/11/22; ethanol (#281100) used on sample to dissipate foam during hydrometer test; test assisted by LTT
Tested By: Madeline Rohde and **Test Date:** 8/9/22
Checked By: Donavon Sieloff **Title:** Supervisor

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
797.76	618.54	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.75"	0.00	0.00	100.0
		0.375"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.00	0.00	100.0
54.48	0.00	#20	0.03	0.00	99.9
		#40	0.52	0.00	99.0
		#60	1.82	0.00	95.6
		#100	4.32	0.00	87.7
		#140	5.02	0.00	78.5
		#200	6.28	0.00	67.0

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =54.48
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -4
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 **-** 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.0	28.0	24.4	0.0133	28.0	11.7	0.0455	44.8
2.00	22.0	23.0	19.4	0.0133	23.0	12.5	0.0333	35.6
4.00	22.0	21.0	17.4	0.0133	21.0	12.9	0.0239	32.0
15.00	22.0	17.0	13.4	0.0133	17.0	13.5	0.0126	24.6
30.00	22.0	14.0	10.4	0.0133	14.0	14.0	0.0091	19.1
60.00	23.0	13.0	9.7	0.0132	13.0	14.2	0.0064	17.7
240.00	23.0	11.0	7.7	0.0132	11.0	14.5	0.0032	14.1
1440.00	22.0	9.0	5.4	0.0133	9.0	14.8	0.0014	9.9

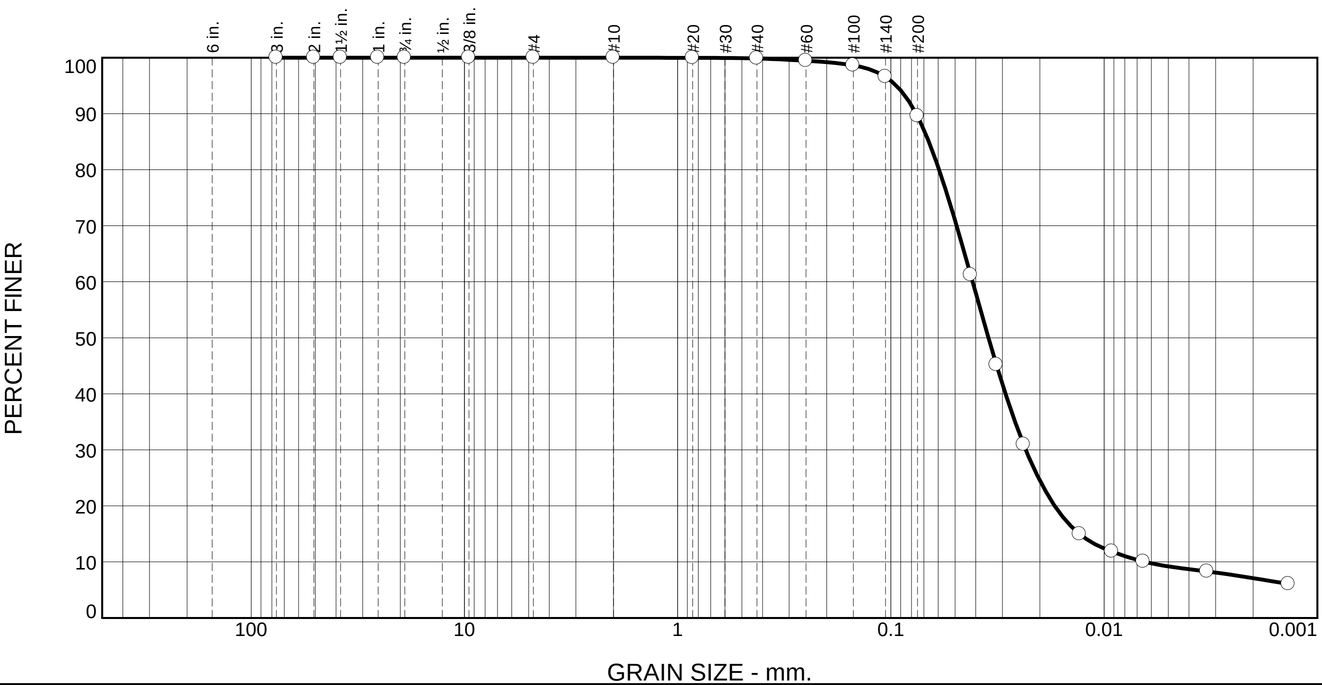
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	1.0	32.0	33.0	50.2	16.8	67.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0014	0.0037	0.0097	0.0190	0.0397	0.0515	0.0639	0.1116	0.1340	0.1675	0.2350

Fineness Modulus	C_u	C_c
0.15	46.47	4.10

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	10.3	80.4	9.2

TEST RESULTS (D7928 mod - With Hydrometer)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.75"	100.0		
0.375"	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.9		
#60	99.4		
#100	98.6		
#140	96.6		
#200	89.6		
0.0422 mm.	61.2		
0.0320 mm.	45.2		
0.0239 mm.	31.0		
0.0130 mm.	15.0		
0.0092 mm.	11.9		
0.0065 mm.	10.1		
0.0033 mm.	8.3		
0.0014 mm.	6.1		

* (no specification provided)

Material Description

manual description: moist, silt, somewhat compact woodchips, roots, pebbles

geosystems description: silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.0760 D_{85}= 0.0663 D_{60}= 0.0414
D_{50}= 0.0348 D_{30}= 0.0233 D_{15}= 0.0131
D_{10}= 0.0064 C_u= 6.45 C_c= 2.05

Remarks

Batch 47397, HBN 422694; coarse sieved 8/9/22, fine sieved 8/11/22; test assisted by LTT

Date Received: 8/2/22 **Date Tested:** 8/9/22

Tested By: Madeline Rohde and

Checked By: Donavon Sieloff

Title: Supervisor

Location: 2022-GT-GM-02(5-6)
Sample Number: 40249166-006
Date Sampled: 7/28/22

Pace Analytical Services, Inc.

Green Bay, WI

Client: AECOM, Inc. - Milwaukee
Project: 60685299 T.6 SUPERIOR SLIPS

Project No: 40249166 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

8/12/2022

Client: AECOM, Inc. - Milwaukee
Project: 60685299 T.6 SUPERIOR SLIPS
Project Number: 40249166
Location: 2022-GT-GM-02(5-6)
Sample Number: 40249166-006
Material Description: manual description: moist, silt, somewhat compact woodchips, roots, pebbles
geosystems description: silt
Sample Date: 7/28/22
Date Received: 8/2/22 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: ML **AASHTO Classification:** A-4(0)
Grain Size Test Method: D7928 mod - With Hydrometer
Testing Remarks: Batch 47397, HBN 422694; coarse sieved 8/9/22, fine sieved 8/11/22; test assisted by LTT
Tested By: Madeline Rohde and **Test Date:** 8/9/22
Checked By: Donavon Sieloff **Title:** Supervisor

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
852.88	648.29	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.75"	0.00	0.00	100.0
		0.375"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.00	0.00	100.0
56.22	0.00	#20	0.02	0.00	100.0
		#40	0.06	0.00	99.9
		#60	0.23	0.00	99.4
		#100	0.47	0.00	98.6
		#140	1.15	0.00	96.6
		#200	3.93	0.00	89.6

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 100.0

Weight of hydrometer sample =56.22

Automatic temperature correction

Composite correction (fluid density and meniscus height) at 20 deg. C = -4

Meniscus correction only = 0.0

Specific gravity of solids = 2.65

Hydrometer type = 152H

Hydrometer effective depth equation: L = 16.294964 **-** 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.0	38.0	34.4	0.0133	38.0	10.1	0.0422	61.2
2.00	22.0	29.0	25.4	0.0133	29.0	11.5	0.0320	45.2
4.00	22.0	21.0	17.4	0.0133	21.0	12.9	0.0239	31.0
15.00	22.0	12.0	8.4	0.0133	12.0	14.3	0.0130	15.0
30.00	23.0	10.0	6.7	0.0132	10.0	14.7	0.0092	11.9
60.00	23.0	9.0	5.7	0.0132	9.0	14.8	0.0065	10.1
240.00	23.0	8.0	4.7	0.0132	8.0	15.0	0.0033	8.3
1440.00	22.0	7.0	3.4	0.0133	7.0	15.1	0.0014	6.1

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.1	10.3	10.4	80.4	9.2	89.6

D_{5}	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0064	0.0131	0.0170	0.0233	0.0290	0.0348	0.0414	0.0594	0.0663	0.0760	0.0943

Fineness Modulus	C_{u}	C_{c}
0.02	6.45	2.05

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Appendix D RSL Outputs

Site-specific

Fish Regional Screening Levels (RSL) for Fish

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = OW; W = TEF applied; E = RPF applied; G = see user's guide; U = user provided; ca = cancer; nc = noncancer; * = where: nc SL < 100X ca SL; ** = where nc SL < 10X ca SL; SSL values are based on DAF=1; max = ceiling limit exceeded; sat = Csat exceeded.

Chemical	CAS Number	Mutagen?	Volatile?	Chemical Type	SF_o(mg/kg-day)$^{-1}$	SF_oRef	RfD (mg/kg-day)	RfD Ref	Ingestion SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Screening Level (mg/kg)
DDD, p,p`- (DDD)	72-54-8	No	No	Organics	2.40E-01	I	5.00E-04	A	6.24E-02	2.78E+00	6.24E-02 ca*
DDE, p,p'-	72-55-9	No	Yes	Organics	3.40E-01	I	5.00E-04	A	4.40E-02	2.78E+00	4.40E-02 ca*
DDT	50-29-3	No	No	Organics	3.40E-01	I	5.00E-04	I	4.40E-02	2.78E+00	4.40E-02 ca*
Dieldrin	60-57-1	No	No	Organics	1.60E+01	I	5.00E-05	I	9.36E-04	2.78E-01	9.36E-04 ca

Output generated 04NOV2022:09:32:41

Appendix E ProUCL Outputs

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.2 11/4/2022 8:55:38 AM
From File	ProUCL Input General Mills_b.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Dibenzofuran (µg/kg)

General Statistics

Total Number of Observations	67	Number of Distinct Observations	54
		Number of Missing Observations	11
Number of Detects	61	Number of Non-Detects	6
Number of Distinct Detects	49	Number of Distinct Non-Detects	5
Minimum Detect	0.16	Minimum Non-Detect	20
Maximum Detect	2000	Maximum Non-Detect	24
Variance Detects	112857	Percent Non-Detects	8.955%
Mean Detects	283.9	SD Detects	335.9
Median Detects	180	CV Detects	1.183
Skewness Detects	2.76	Kurtosis Detects	10.75
Mean of Logged Detects	4.751	SD of Logged Detects	1.99

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.743	**Normal GOF Test on Detected Observations Only**
1% Shapiro Wilk P Value	6.084E-14	Detected Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.199	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.131	Detected Data Not Normal at 1% Significance Level

Detected Data Not Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	258.9	KM Standard Error of Mean	40.38
90KM SD	327.8	95% KM (BCA) UCL	326.6
95% KM (t) UCL	326.3	95% KM (Percentile Bootstrap) UCL	325
95% KM (z) UCL	325.3	95% KM Bootstrap t UCL	353.4
90% KM Chebyshev UCL	380	95% KM Chebyshev UCL	434.9
97.5% KM Chebyshev UCL	511.1	99% KM Chebyshev UCL	660.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.713	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.799	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.102	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.119	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.677	k star (bias corrected MLE)	0.654

Theta hat (MLE)	419.6	Theta star (bias corrected MLE)	434
nu hat (MLE)	82.55	nu star (bias corrected)	79.82
Mean (detects)	283.9		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	258.5
Maximum	2000	Median	160
SD	330.6	CV	1.279
k hat (MLE)	0.401	k star (bias corrected MLE)	0.393
Theta hat (MLE)	645.1	Theta star (bias corrected MLE)	658.2
nu hat (MLE)	53.7	nu star (bias corrected)	52.63
Adjusted Level of Significance (β)	0.0464		
Approximate Chi Square Value (52.63, α)	36.96	Adjusted Chi Square Value (52.63, β)	36.68
95% Gamma Approximate UCL	368.1	95% Gamma Adjusted UCL	371

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	258.9	SD (KM)	327.8
Variance (KM)	107444	SE of Mean (KM)	40.38
k hat (KM)	0.624	k star (KM)	0.606
nu hat (KM)	83.59	nu star (KM)	81.18
theta hat (KM)	415	theta star (KM)	427.3
80% gamma percentile (KM)	426.7	90% gamma percentile (KM)	671.9
95% gamma percentile (KM)	928.3	99% gamma percentile (KM)	1548

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (81.18, α)	61.42	Adjusted Chi Square Value (81.18, β)	61.04
95% KM Approximate Gamma UCL	342.2	95% KM Adjusted Gamma UCL	344.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.785	**Shapiro Wilk GOF Test**
10% Shapiro Wilk P Value	9.074E-12	Detected Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.194	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.104	Detected Data Not Lognormal at 10% Significance Level

Detected Data Not Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	259	Mean in Log Scale	4.484
SD in Original Scale	330.1	SD in Log Scale	2.084
95% t UCL (assumes normality of ROS data)	326.3	95% Percentile Bootstrap UCL	326.4
95% BCA Bootstrap UCL	337.6	95% Bootstrap t UCL	345
95% H-UCL (Log ROS)	1695		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	4.309	KM Geo Mean	74.38
KM SD (logged)	2.421	95% Critical H Value (KM-Log)	3.121
KM Standard Error of Mean (logged)	0.314	95% H-UCL (KM -Log)	3530
KM SD (logged)	2.421	95% Critical H Value (KM-Log)	3.121
KM Standard Error of Mean (logged)	0.314		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	259.5	Mean in Log Scale	4.54
SD in Original Scale	329.8	SD in Log Scale	2.016
95% t UCL (Assumes normality)	326.7	95% H-Stat UCL	1500

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL 342.2

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.
Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Antimony (mg/kg)

General Statistics

Total Number of Observations	78	Number of Distinct Observations	61
Number of Detects	19	Number of Non-Detects	59
Number of Distinct Detects	17	Number of Distinct Non-Detects	44
Minimum Detect	0.49	Minimum Non-Detect	5.1
Maximum Detect	2.2	Maximum Non-Detect	16.2
Variance Detects	0.147	Percent Non-Detects	75.64%
Mean Detects	0.832	SD Detects	0.383
Median Detects	0.74	CV Detects	0.461
Skewness Detects	2.739	Kurtosis Detects	9.272
Mean of Logged Detects	-0.253	SD of Logged Detects	0.355

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.705	Shapiro Wilk GOF Test
1% Shapiro Wilk Critical Value	0.863	Detected Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.249	Lilliefors GOF Test
1% Lilliefors Critical Value	0.229	Detected Data Not Normal at 1% Significance Level

Detected Data Not Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.832	KM Standard Error of Mean	0.0879
90KM SD	0.373	95% KM (BCA) UCL	1.002
95% KM (t) UCL	0.978	95% KM (Percentile Bootstrap) UCL	0.989
95% KM (z) UCL	0.977	95% KM Bootstrap t UCL	1.105
90% KM Chebyshev UCL	1.096	95% KM Chebyshev UCL	1.215
97.5% KM Chebyshev UCL	1.381	99% KM Chebyshev UCL	1.707

Note: KM UCLs may be biased low with this dataset. Other substitution method recommended

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.905	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.742	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.204	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.199	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	7.37	k star (bias corrected MLE)	6.241
Theta hat (MLE)	0.113	Theta star (bias corrected MLE)	0.133
nu hat (MLE)	280.1	nu star (bias corrected)	237.2
Mean (detects)	0.832		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.49	Mean	0.809
Maximum	2.2	Median	0.798
SD	0.211	CV	0.261
k hat (MLE)	20.28	k star (bias corrected MLE)	19.51
Theta hat (MLE)	0.0399	Theta star (bias corrected MLE)	0.0415
nu hat (MLE)	3164	nu star (bias corrected)	3043
Adjusted Level of Significance (β)	0.0469		
Approximate Chi Square Value (N/A, α)	2916	Adjusted Chi Square Value (N/A, β)	2914
95% Gamma Approximate UCL	0.845	95% Gamma Adjusted UCL	0.845

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.832	SD (KM)	0.373
Variance (KM)	0.139	SE of Mean (KM)	0.0879
k hat (KM)	4.975	k star (KM)	4.793
nu hat (KM)	776.2	nu star (KM)	747.6
theta hat (KM)	0.167	theta star (KM)	0.174
80% gamma percentile (KM)	1.124	90% gamma percentile (KM)	1.341
95% gamma percentile (KM)	1.54	99% gamma percentile (KM)	1.96

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (747.65, α)	685.2	Adjusted Chi Square Value (747.65, β)	684.1
95% KM Approximate Gamma UCL	0.908	95% KM Adjusted Gamma UCL	0.909

Note: KM UCLs may be biased low with this dataset. Other substitution method recommended

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.89	Shapiro Wilk GOF Test
10% Shapiro Wilk Critical Value	0.917	Detected Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.176	Lilliefors GOF Test
10% Lilliefors Critical Value	0.18	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Approximate Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.794	Mean in Log Scale	-0.253
SD in Original Scale	0.203	SD in Log Scale	0.2
95% t UCL (assumes normality of ROS data)	0.832	95% Percentile Bootstrap UCL	0.836
95% BCA Bootstrap UCL	0.846	95% Bootstrap t UCL	0.851
95% H-UCL (Log ROS)	0.823		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.253	KM Geo Mean	0.776
KM SD (logged)	0.346	95% Critical H Value (KM-Log)	1.77
KM Standard Error of Mean (logged)	0.0815	95% H-UCL (KM -Log)	0.884
KM SD (logged)	0.346	95% Critical H Value (KM-Log)	1.77
KM Standard Error of Mean (logged)	0.0815		

Note: KM UCLs may be biased low with this dataset. Other substitution method recommended

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	3.316	Mean in Log Scale	0.981
SD in Original Scale	1.758	SD in Log Scale	0.761
95% t UCL (Assumes normality)	3.648	95% H-Stat UCL	4.254

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 10% Significance Level

Suggested UCL to Use

KM H-UCL 0.884

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Cadmium (mg/kg)

General Statistics

Total Number of Observations	72	Number of Distinct Observations	49

		Number of Missing Observations	6
Number of Detects	68	Number of Non-Detects	4
Number of Distinct Detects	45	Number of Distinct Non-Detects	4
Minimum Detect	0.14	Minimum Non-Detect	2
Maximum Detect	1.3	Maximum Non-Detect	3.3
Variance Detects	0.0825	Percent Non-Detects	5.556%
Mean Detects	0.528	SD Detects	0.287
Median Detects	0.52	CV Detects	0.544
Skewness Detects	0.694	Kurtosis Detects	-0.217
Mean of Logged Detects	-0.795	SD of Logged Detects	0.586

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.93	**Normal GOF Test on Detected Observations Only**
1% Shapiro Wilk P Value	9.2875E-4	Detected Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.119	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.124	Detected Data appear Normal at 1% Significance Level

Detected Data appear Approximate Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.528	KM Standard Error of Mean	0.0348
90KM SD	0.285	95% KM (BCA) UCL	0.59
95% KM (t) UCL	0.586	95% KM (Percentile Bootstrap) UCL	0.588
95% KM (z) UCL	0.586	95% KM Bootstrap t UCL	0.588
90% KM Chebyshev UCL	0.633	95% KM Chebyshev UCL	0.68
97.5% KM Chebyshev UCL	0.746	99% KM Chebyshev UCL	0.875

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.382	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.757	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0763	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.109	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.339	k star (bias corrected MLE)	3.201
Theta hat (MLE)	0.158	Theta star (bias corrected MLE)	0.165
nu hat (MLE)	454.1	nu star (bias corrected)	435.4
Mean (detects)	0.528		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.14	Mean	0.526
Maximum	1.3	Median	0.479
SD	0.279	CV	0.531

k hat (MLE)	3.521	k star (bias corrected MLE)	3.384
Theta hat (MLE)	0.149	Theta star (bias corrected MLE)	0.155
nu hat (MLE)	507	nu star (bias corrected)	487.2
Adjusted Level of Significance (β)	0.0467		
Approximate Chi Square Value (487.23, α)	437	Adjusted Chi Square Value (487.23, β)	436.1
95% Gamma Approximate UCL	0.586	95% Gamma Adjusted UCL	0.587

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.528	SD (KM)	0.285
Variance (KM)	0.0813	SE of Mean (KM)	0.0348
k hat (KM)	3.434	k star (KM)	3.3
nu hat (KM)	494.5	nu star (KM)	475.2
theta hat (KM)	0.154	theta star (KM)	0.16
80% gamma percentile (KM)	0.745	90% gamma percentile (KM)	0.918
95% gamma percentile (KM)	1.079	99% gamma percentile (KM)	1.426

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (475.24, α)	425.7	Adjusted Chi Square Value (475.24, β)	424.7
95% KM Approximate Gamma UCL	0.59	95% KM Adjusted Gamma UCL	0.591

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.953	**Shapiro Wilk GOF Test**
10% Shapiro Wilk P Value	0.0302	Detected Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.11	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.0982	Detected Data Not Lognormal at 10% Significance Level

Detected Data Not Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.524	Mean in Log Scale	-0.795
SD in Original Scale	0.28	SD in Log Scale	0.569
95% t UCL (assumes normality of ROS data)	0.579	95% Percentile Bootstrap UCL	0.579
95% BCA Bootstrap UCL	0.581	95% Bootstrap t UCL	0.583
95% H-UCL (Log ROS)	0.603		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.795	KM Geo Mean	0.451
KM SD (logged)	0.581	95% Critical H Value (KM-Log)	1.904
KM Standard Error of Mean (logged)	0.071	95% H-UCL (KM -Log)	0.61
KM SD (logged)	0.581	95% Critical H Value (KM-Log)	1.904
KM Standard Error of Mean (logged)	0.071		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.57	Mean in Log Scale	-0.738
SD in Original Scale	0.334	SD in Log Scale	0.618
95% t UCL (Assumes normality)	0.636	95% H-Stat UCL	0.667

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL 0.586

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Manganese (mg/kg)

General Statistics

Total Number of Observations	78	Number of Distinct Observations	70
		Number of Missing Observations	0
Minimum	141	Mean	391.2
Maximum	1130	Median	331.5
SD	193.1	Std. Error of Mean	21.87
Coefficient of Variation	0.494	Skewness	1.563

Normal GOF Test

Shapiro Wilk Test Statistic	0.866	Shapiro Wilk GOF Test
1% Shapiro Wilk P Value	1.4665E-9	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.146	Lilliefors GOF Test
1% Lilliefors Critical Value	0.116	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	427.7	95% Adjusted-CLT UCL (Chen-1995)	431.3
		95% Modified-t UCL (Johnson-1978)	428.3

Gamma GOF Test

A-D Test Statistic	1.027	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.114	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.101	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.066	k star (bias corrected MLE)	4.879
Theta hat (MLE)	77.24	Theta star (bias corrected MLE)	80.18

nu hat (MLE)	790.2	nu star (bias corrected)	761.2
MLE Mean (bias corrected)	391.2	MLE Sd (bias corrected)	177.1
		Approximate Chi Square Value (0.05)	698.2
Adjusted Level of Significance	0.0469	Adjusted Chi Square Value	697

Assuming Gamma Distribution

95% Approximate Gamma UCL	426.6	95% Adjusted Gamma UCL	427.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.972	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk P Value	0.281	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.0942	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.0919	Data Not Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	4.949	Mean of logged Data	5.867
Maximum of Logged Data	7.03	SD of logged Data	0.444

Assuming Lognormal Distribution

95% H-UCL	427.5	90% Chebyshev (MVUE) UCL	450.5
95% Chebyshev (MVUE) UCL	478.2	97.5% Chebyshev (MVUE) UCL	516.7
99% Chebyshev (MVUE) UCL	592.2		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	427.2	95% BCA Bootstrap UCL	431.6
95% Standard Bootstrap UCL	426.3	95% Bootstrap-t UCL	431.8
95% Hall's Bootstrap UCL	431.7	95% Percentile Bootstrap UCL	428.3
90% Chebyshev(Mean, Sd) UCL	456.9	95% Chebyshev(Mean, Sd) UCL	486.6
97.5% Chebyshev(Mean, Sd) UCL	527.8	99% Chebyshev(Mean, Sd) UCL	608.8

Suggested UCL to Use

95% H-UCL	427.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Aroclor 1248 (µg/kg)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	19
		Number of Missing Observations	50
Number of Detects	1	Number of Non-Detects	22
Number of Distinct Detects	1	Number of Distinct Non-Detects	18

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Aroclor 1248 (µg/kg) was not processed!

Aroclor 1254 (µg/kg)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	19
		Number of Missing Observations	50
Number of Detects	6	Number of Non-Detects	17
Number of Distinct Detects	5	Number of Distinct Non-Detects	14
Minimum Detect	12	Minimum Non-Detect	40
Maximum Detect	140	Maximum Non-Detect	100
Variance Detects	2243	Percent Non-Detects	73.91%
Mean Detects	45.17	SD Detects	47.36
Median Detects	31	CV Detects	1.048
Skewness Detects	2.242	Kurtosis Detects	5.244
Mean of Logged Detects	3.483	SD of Logged Detects	0.823

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.681	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.713	Detected Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.41	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.373	Detected Data Not Normal at 1% Significance Level

Detected Data Not Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	31.15	KM Standard Error of Mean	6.825
90KM SD	24.88	95% KM (BCA) UCL	42.76
95% KM (t) UCL	42.87	95% KM (Percentile Bootstrap) UCL	42.76
95% KM (z) UCL	42.37	95% KM Bootstrap t UCL	47.86
90% KM Chebyshev UCL	51.62	95% KM Chebyshev UCL	60.9
97.5% KM Chebyshev UCL	73.77	99% KM Chebyshev UCL	99.06

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.574	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.707	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.341	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.337	Detected Data Not Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level
Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	1.673	k star (bias corrected MLE)	0.948
Theta hat (MLE)	26.99	Theta star (bias corrected MLE)	47.66

nu hat (MLE)	20.08	nu star (bias corrected)	11.37
Mean (detects)	45.17		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	12	Mean	30.72
Maximum	140	Median	25.15
SD	25.07	CV	0.816
k hat (MLE)	3.462	k star (bias corrected MLE)	3.04
Theta hat (MLE)	8.872	Theta star (bias corrected MLE)	10.1
nu hat (MLE)	159.3	nu star (bias corrected)	139.8
Adjusted Level of Significance (β)	0.0389		
Approximate Chi Square Value (139.83, α)	113.5	Adjusted Chi Square Value (139.83, β)	111.8
95% Gamma Approximate UCL	37.84	95% Gamma Adjusted UCL	38.42

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	31.15	SD (KM)	24.88
Variance (KM)	619.1	SE of Mean (KM)	6.825
k hat (KM)	1.567	k star (KM)	1.392
nu hat (KM)	72.09	nu star (KM)	64.02
theta hat (KM)	19.88	theta star (KM)	22.38
80% gamma percentile (KM)	48.58	90% gamma percentile (KM)	66.11
95% gamma percentile (KM)	83.21	99% gamma percentile (KM)	122

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (64.02, α)	46.61	Adjusted Chi Square Value (64.02, β)	45.53
95% KM Approximate Gamma UCL	42.78	95% KM Adjusted Gamma UCL	43.79

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.914	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.826	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.285	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.298	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	30.75	Mean in Log Scale	3.294
SD in Original Scale	24.58	SD in Log Scale	0.44
95% t UCL (assumes normality of ROS data)	39.55	95% Percentile Bootstrap UCL	40.66
95% BCA Bootstrap UCL	46.28	95% Bootstrap t UCL	58.44
95% H-UCL (Log ROS)	35.57		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.267	KM Geo Mean	26.23
KM SD (logged)	0.536	95% Critical H Value (KM-Log)	2.004
KM Standard Error of Mean (logged)	0.208	95% H-UCL (KM -Log)	38.06
KM SD (logged)	0.536	95% Critical H Value (KM-Log)	2.004
KM Standard Error of Mean (logged)	0.208		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	36.87	Mean in Log Scale	3.494
SD in Original Scale	24.13	SD in Log Scale	0.444
95% t UCL (Assumes normality)	45.51	95% H-Stat UCL	43.57

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Adjusted Gamma UCL 43.79

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.
Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Aroclor 1260 (µg/kg)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	22
		Number of Missing Observations	50
Number of Detects	14	Number of Non-Detects	9
Number of Distinct Detects	14	Number of Distinct Non-Detects	9
Minimum Detect	3.7	Minimum Non-Detect	40
Maximum Detect	150	Maximum Non-Detect	96
Variance Detects	1439	Percent Non-Detects	39.13%
Mean Detects	29.24	SD Detects	37.94
Median Detects	15.5	CV Detects	1.297
Skewness Detects	2.829	Kurtosis Detects	8.847
Mean of Logged Detects	2.874	SD of Logged Detects	0.986

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.634	Shapiro Wilk GOF Test	

1% Shapiro Wilk Critical Value	0.825	Detected Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.269	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.263	Detected Data Not Normal at 1% Significance Level	

Detected Data Not Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	24.75	KM Standard Error of Mean	6.867
90KM SD	30.15	95% KM (BCA) UCL	38.21
95% KM (t) UCL	36.54	95% KM (Percentile Bootstrap) UCL	37.26
95% KM (z) UCL	36.04	95% KM Bootstrap t UCL	47.83
90% KM Chebyshev UCL	45.35	95% KM Chebyshev UCL	54.68
97.5% KM Chebyshev UCL	67.63	99% KM Chebyshev UCL	93.08

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.579	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.757	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.223	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.234	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.134	k star (bias corrected MLE)	0.938
Theta hat (MLE)	25.79	Theta star (bias corrected MLE)	31.16
nu hat (MLE)	31.75	nu star (bias corrected)	26.28
Mean (detects)	29.24		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	3.7	Mean	23.33
Maximum	150	Median	15.17
SD	30.13	CV	1.291
k hat (MLE)	1.512	k star (bias corrected MLE)	1.343
Theta hat (MLE)	15.44	Theta star (bias corrected MLE)	17.37
nu hat (MLE)	69.54	nu star (bias corrected)	61.8
Adjusted Level of Significance (β)	0.0389		
Approximate Chi Square Value (61.80, α)	44.72	Adjusted Chi Square Value (61.80, β)	43.66
95% Gamma Approximate UCL	32.24	95% Gamma Adjusted UCL	33.02

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	24.75	SD (KM)	30.15
Variance (KM)	908.9	SE of Mean (KM)	6.867
k hat (KM)	0.674	k star (KM)	0.615
nu hat (KM)	31	nu star (KM)	28.29
theta hat (KM)	36.73	theta star (KM)	40.24

80% gamma percentile (KM)	40.79	90% gamma percentile (KM)	64.01
95% gamma percentile (KM)	88.27	99% gamma percentile (KM)	146.8

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (28.29, α)	17.15	Adjusted Chi Square Value (28.29, β)	16.52
95% KM Approximate Gamma UCL	40.82	95% KM Adjusted Gamma UCL	42.37

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.971	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.895	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.159	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.208	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	23.43	Mean in Log Scale	2.792
SD in Original Scale	30.09	SD in Log Scale	0.766
95% t UCL (assumes normality of ROS data)	34.2	95% Percentile Bootstrap UCL	34.62
95% BCA Bootstrap UCL	41.31	95% Bootstrap t UCL	55.35
95% H-UCL (Log ROS)	31.52		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.777	KM Geo Mean	16.07
KM SD (logged)	0.876	95% Critical H Value (KM-Log)	2.369
KM Standard Error of Mean (logged)	0.227	95% H-UCL (KM -Log)	36.72
KM SD (logged)	0.876	95% Critical H Value (KM-Log)	2.369
KM Standard Error of Mean (logged)	0.227		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	30.47	Mean in Log Scale	3.091
SD in Original Scale	29.92	SD in Log Scale	0.832
95% t UCL (Assumes normality)	41.19	95% H-Stat UCL	46.85

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Adjusted Gamma UCL	42.37

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.
Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Aroclor 1262 (µg/kg)

General Statistics

Total Number of Observations	14	Number of Distinct Observations	13
		Number of Missing Observations	59
Number of Detects	3	Number of Non-Detects	11
Number of Distinct Detects	3	Number of Distinct Non-Detects	11
Minimum Detect	20	Minimum Non-Detect	40
Maximum Detect	40	Maximum Non-Detect	100
Variance Detects	103	Percent Non-Detects	78.57%
Mean Detects	31	SD Detects	10.15
Median Detects	33	CV Detects	0.327
Skewness Detects	-0.852	Kurtosis Detects	N/A
Mean of Logged Detects	3.394	SD of Logged Detects	0.358

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.971	Shapiro Wilk GOF Test
1% Shapiro Wilk Critical Value	0.753	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.245	Lilliefors GOF Test
1% Lilliefors Critical Value	0.429	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	29.88	KM Standard Error of Mean	5.535
90KM SD	8.115	95% KM (BCA) UCL	N/A
95% KM (t) UCL	39.68	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	38.98	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	46.48	95% KM Chebyshev UCL	54
97.5% KM Chebyshev UCL	64.44	99% KM Chebyshev UCL	84.95

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.317	Anderson-Darling GOF Test
5% A-D Critical Value	0.635	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.291	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.432	Detected data appear Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	12.58	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2.465	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	75.46	nu star (bias corrected)	N/A

Mean (detects)	31		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	20	Mean	29.13
Maximum	40	Median	28.9
SD	4.184	CV	0.144
k hat (MLE)	52.49	k star (bias corrected MLE)	41.29
Theta hat (MLE)	0.555	Theta star (bias corrected MLE)	0.706
nu hat (MLE)	1470	nu star (bias corrected)	1156
Adjusted Level of Significance (β)	0.0312		
Approximate Chi Square Value (N/A, α)	1078	Adjusted Chi Square Value (N/A, β)	1068
95% Gamma Approximate UCL	31.24	95% Gamma Adjusted UCL	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	29.88	SD (KM)	8.115
Variance (KM)	65.86	SE of Mean (KM)	5.535
k hat (KM)	13.55	k star (KM)	10.7
nu hat (KM)	379.5	nu star (KM)	299.5
theta hat (KM)	2.204	theta star (KM)	2.793
80% gamma percentile (KM)	37.17	90% gamma percentile (KM)	42.02
95% gamma percentile (KM)	46.31	99% gamma percentile (KM)	55.12

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (299.47, α)	260.4	Adjusted Chi Square Value (299.47, β)	255.6
95% KM Approximate Gamma UCL	34.36	95% KM Adjusted Gamma UCL	35.01

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk GOF Test**
10% Shapiro Wilk Critical Value	0.789	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.28	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.389	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	28.53	Mean in Log Scale	3.341
SD in Original Scale	4.275	SD in Log Scale	0.146
95% t UCL (assumes normality of ROS data)	30.56	95% Percentile Bootstrap UCL	30.44
95% BCA Bootstrap UCL	30.53	95% Bootstrap t UCL	31.13
95% H-UCL (Log ROS)	30.7		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	3.357	KM Geo Mean	28.7

KM SD (logged)	0.289	95% Critical H Value (KM-Log)	1.885
KM Standard Error of Mean (logged)	0.201	95% H-UCL (KM -Log)	34.81
KM SD (logged)	0.289	95% Critical H Value (KM-Log)	1.885
KM Standard Error of Mean (logged)	0.201		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	32.54	Mean in Log Scale	3.438
SD in Original Scale	10.03	SD in Log Scale	0.313
95% t UCL (Assumes normality)	37.28	95% H-Stat UCL	38.53

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL 39.68

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

4,4'DDD (µg/kg)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6
Minimum	1.1	Mean	45.8
Maximum	110	Median	27
SD	47.44	Std. Error of Mean	21.21
Coefficient of Variation	1.036	Skewness	0.648

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.891	Shapiro Wilk GOF Test
1% Shapiro Wilk Critical Value	0.686	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.254	Lilliefors GOF Test
1% Lilliefors Critical Value	0.396	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	91.03	95% Adjusted-CLT UCL (Chen-1995)	87.26
		95% Modified-t UCL (Johnson-1978)	92.05

Gamma GOF Test

A-D Test Statistic	0.237	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.701	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.219	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.368	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	0.696	k star (bias corrected MLE)	0.412
Theta hat (MLE)	65.78	Theta star (bias corrected MLE)	111.2
nu hat (MLE)	6.963	nu star (bias corrected)	4.119
MLE Mean (bias corrected)	45.8	MLE Sd (bias corrected)	71.37
		Approximate Chi Square Value (0.05)	0.769
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.322

Assuming Gamma Distribution

95% Approximate Gamma UCL	245.3	95% Adjusted Gamma UCL	586.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.806	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.18	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.319	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal Statistics

Minimum of Logged Data	0.0953	Mean of logged Data	2.956
Maximum of Logged Data	4.7	SD of logged Data	1.861

Assuming Lognormal Distribution

95% H-UCL	373899	90% Chebyshev (MVUE) UCL	191.2
95% Chebyshev (MVUE) UCL	250	97.5% Chebyshev (MVUE) UCL	331.7
99% Chebyshev (MVUE) UCL	492		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	80.69	95% BCA Bootstrap UCL	78.38
95% Standard Bootstrap UCL	77.15	95% Bootstrap-t UCL	175.7
95% Hall's Bootstrap UCL	403.3	95% Percentile Bootstrap UCL	78.38
90% Chebyshev(Mean, Sd) UCL	109.4	95% Chebyshev(Mean, Sd) UCL	138.3

97.5% Chebyshev(Mean, Sd) UCL	178.3	99% Chebyshev(Mean, Sd) UCL	256.9

Suggested UCL to Use

95% Student's-t UCL	91.03

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.
Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

4,4'DDE (µg/kg)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6
Number of Detects	3	Number of Non-Detects	2
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	1.4	Minimum Non-Detect	5.8
Maximum Detect	5.5	Maximum Non-Detect	72
Variance Detects	4.203	Percent Non-Detects	40%
Mean Detects	3.467	SD Detects	2.05
Median Detects	3.5	CV Detects	0.591
Skewness Detects	-0.0731	Kurtosis Detects	N/A
Mean of Logged Detects	1.098	SD of Logged Detects	0.697

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	1	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.753	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.177	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.429	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level
Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.467	KM Standard Error of Mean	1.184
90KM SD	1.674	95% KM (BCA) UCL	N/A
95% KM (t) UCL	5.99	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	5.414	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	7.018	95% KM Chebyshev UCL	8.626
97.5% KM Chebyshev UCL	10.86	99% KM Chebyshev UCL	15.24

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.272	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.636	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.244	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.434	Detected data appear Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.602	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.963	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	21.61	nu star (bias corrected)	N/A
Mean (detects)	3.467		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	1.4	Mean	3.4
Maximum	5.5	Median	3.299
SD	1.453	CV	0.427
k hat (MLE)	5.882	k star (bias corrected MLE)	2.486
Theta hat (MLE)	0.578	Theta star (bias corrected MLE)	1.367
nu hat (MLE)	58.82	nu star (bias corrected)	24.86
Adjusted Level of Significance (β)	0.0086		
Approximate Chi Square Value (24.86, α)	14.5	Adjusted Chi Square Value (24.86, β)	11.2
95% Gamma Approximate UCL	5.827	95% Gamma Adjusted UCL	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.467	SD (KM)	1.674
Variance (KM)	2.802	SE of Mean (KM)	1.184
k hat (KM)	4.289	k star (KM)	1.849
nu hat (KM)	42.89	nu star (KM)	18.49
theta hat (KM)	0.808	theta star (KM)	1.875
80% gamma percentile (KM)	5.238	90% gamma percentile (KM)	6.869
95% gamma percentile (KM)	8.432	99% gamma percentile (KM)	11.91

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (18.49, α)	9.744	Adjusted Chi Square Value (18.49, β)	7.138
95% KM Approximate Gamma UCL	6.577	95% KM Adjusted Gamma UCL	8.979

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.963	Shapiro Wilk GOF Test	
10% Shapiro Wilk Critical Value	0.789	Detected Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.255	Lilliefors GOF Test	
10% Lilliefors Critical Value	0.389	Detected Data appear Lognormal at 10% Significance Level	

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.279	Mean in Log Scale	1.098
SD in Original Scale	1.472	SD in Log Scale	0.493
95% t UCL (assumes normality of ROS data)	4.683	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	6.961		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.098	KM Geo Mean	2.998
KM SD (logged)	0.569	95% Critical H Value (KM-Log)	3.178
KM Standard Error of Mean (logged)	0.402	95% H-UCL (KM -Log)	8.709
KM SD (logged)	0.569	95% Critical H Value (KM-Log)	3.178
KM Standard Error of Mean (logged)	0.402		

Note: KM UCLs may be biased low with this dataset. Other substitution method recommended

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	9.86	Mean in Log Scale	1.588
SD in Original Scale	14.69	SD in Log Scale	1.219
95% t UCL (Assumes normality)	23.86	95% H-Stat UCL	368

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL 5.99

Warning: Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

4,4'DDT (µg/kg)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6

Minimum	0.61	Mean	41.82
Maximum	190	Median	5.7
SD	82.93	Std. Error of Mean	37.09
Coefficient of Variation	1.983	Skewness	2.223

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.596	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.686	Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.445	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.396	Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	120.9	95% Adjusted-CLT UCL (Chen-1995)	142.2
		95% Modified-t UCL (Johnson-1978)	127

Gamma GOF Test

A-D Test Statistic	0.526	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.73	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.333	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.377	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	0.364	k star (bias corrected MLE)	0.279
Theta hat (MLE)	115	Theta star (bias corrected MLE)	150
nu hat (MLE)	3.637	nu star (bias corrected)	2.788
MLE Mean (bias corrected)	41.82	MLE Sd (bias corrected)	79.21
		Approximate Chi Square Value (0.05)	0.312
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.117

Assuming Gamma Distribution

95% Approximate Gamma UCL	373.1	95% Adjusted Gamma UCL	994.8

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.955	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.806	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.209	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.319	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal Statistics

Minimum of Logged Data	-0.494	Mean of logged Data	1.896
Maximum of Logged Data	5.247	SD of logged Data	2.175

Assuming Lognormal Distribution

95% H-UCL	4604193	90% Chebyshev (MVUE) UCL	100.7
95% Chebyshev (MVUE) UCL	132.6	97.5% Chebyshev (MVUE) UCL	176.8
99% Chebyshev (MVUE) UCL	263.8		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	102.8	95% BCA Bootstrap UCL	117.3
95% Standard Bootstrap UCL	97.54	95% Bootstrap-t UCL	1377
95% Hall's Bootstrap UCL	915.1	95% Percentile Bootstrap UCL	114.7
90% Chebyshev(Mean, Sd) UCL	153.1	95% Chebyshev(Mean, Sd) UCL	203.5
97.5% Chebyshev(Mean, Sd) UCL	273.4	99% Chebyshev(Mean, Sd) UCL	410.9

Suggested UCL to Use

Recommendation cannot be provided

Recommendations are not available due to the sample size and skew of the input data.

Consult with a statistician to evaluate the adequacy of your data to support your objectives or explore alternative estimation methods.

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.

Please verify the data were collected from random locations.

If the data were collected using judgmental or other non-random methods,

then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Dieldrin (µg/kg)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6
Number of Detects	1	Number of Non-Detects	4
Number of Distinct Detects	1	Number of Distinct Non-Detects	4

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Dieldrin (µg/kg) was not processed!

Total DDT (µg/kg)

General Statistics

Total Number of Observations	5	Number of Distinct Observations	5
		Number of Missing Observations	6
Minimum	1.71	Mean	89.7
Maximum	271	Median	30.2
SD	111.1	Std. Error of Mean	49.7
Coefficient of Variation	1.239	Skewness	1.463

Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).
The Chebyshev UCL often results in gross overestimates of the mean.
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.

Normal GOF Test

Shapiro Wilk Test Statistic	0.829	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.686	Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.304	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.396	Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	195.7	95% Adjusted-CLT UCL (Chen-1995)	206.2
		95% Modified-t UCL (Johnson-1978)	201.1

Gamma GOF Test

A-D Test Statistic	0.223	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.705	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.21	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.369	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics

k hat (MLE)	0.622	k star (bias corrected MLE)	0.382
Theta hat (MLE)	144.3	Theta star (bias corrected MLE)	234.8
nu hat (MLE)	6.216	nu star (bias corrected)	3.82
MLE Mean (bias corrected)	89.7	MLE Sd (bias corrected)	145.1
		Approximate Chi Square Value (0.05)	0.652
Adjusted Level of Significance	0.0086	Adjusted Chi Square Value	0.262

Assuming Gamma Distribution

95% Approximate Gamma UCL	525.7	95% Adjusted Gamma UCL	1305

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.94	**Shapiro Wilk Lognormal GOF Test**
10% Shapiro Wilk Critical Value	0.806	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.236	**Lilliefors Lognormal GOF Test**
10% Lilliefors Critical Value	0.319	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal Statistics

Minimum of Logged Data	0.536	Mean of logged Data	3.508
Maximum of Logged Data	5.602	SD of logged Data	1.936

Assuming Lognormal Distribution

95% H-UCL	1442001	90% Chebyshev (MVUE) UCL	366.5
95% Chebyshev (MVUE) UCL	480.1	97.5% Chebyshev (MVUE) UCL	637.9
99% Chebyshev (MVUE) UCL	947.7		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	171.5	95% BCA Bootstrap UCL	192.9
95% Standard Bootstrap UCL	164.5	95% Bootstrap-t UCL	686.9
95% Hall's Bootstrap UCL	963.8	95% Percentile Bootstrap UCL	169
90% Chebyshev(Mean, Sd) UCL	238.8	95% Chebyshev(Mean, Sd) UCL	306.4
97.5% Chebyshev(Mean, Sd) UCL	400.1	99% Chebyshev(Mean, Sd) UCL	584.2

Suggested UCL to Use

95% Student's-t UCL 195.7

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.
Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Tributyltin hydride (µg/kg)

General Statistics

Total Number of Observations	39	Number of Distinct Observations	28
		Number of Missing Observations	39
Number of Detects	9	Number of Non-Detects	30

Number of Distinct Detects	9	Number of Distinct Non-Detects	20
Minimum Detect	0.58	Minimum Non-Detect	1.8
Maximum Detect	81	Maximum Non-Detect	5
Variance Detects	619.6	Percent Non-Detects	76.92%
Mean Detects	19.81	SD Detects	24.89
Median Detects	14	CV Detects	1.257
Skewness Detects	2.198	Kurtosis Detects	5.437
Mean of Logged Detects	2.237	SD of Logged Detects	1.47

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.737	**Shapiro Wilk GOF Test**
1% Shapiro Wilk Critical Value	0.764	Detected Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.26	**Lilliefors GOF Test**
1% Lilliefors Critical Value	0.316	Detected Data appear Normal at 1% Significance Level

Detected Data appear Approximate Normal at 1% Significance Level

Note GOF tests may be unreliable for small sample sizes

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	5.048	KM Standard Error of Mean	2.357
90KM SD	13.88	95% KM (BCA) UCL	10.3
95% KM (t) UCL	9.022	95% KM (Percentile Bootstrap) UCL	9.531
95% KM (z) UCL	8.925	95% KM Bootstrap t UCL	13.34
90% KM Chebyshev UCL	12.12	95% KM Chebyshev UCL	15.32
97.5% KM Chebyshev UCL	19.77	99% KM Chebyshev UCL	28.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.211	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.75	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.158	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.289	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Note GOF tests may be unreliable for small sample sizes

Gamma Statistics on Detected Data Only

k hat (MLE)	0.794	k star (bias corrected MLE)	0.603
Theta hat (MLE)	24.96	Theta star (bias corrected MLE)	32.84
nu hat (MLE)	14.28	nu star (bias corrected)	10.86
Mean (detects)	19.81		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	4.579
Maximum	81	Median	0.01
SD	14.21	CV	3.103

k hat (MLE)	0.166	k star (bias corrected MLE)	0.171
Theta hat (MLE)	27.51	Theta star (bias corrected MLE)	26.82
nu hat (MLE)	12.98	nu star (bias corrected)	13.32
Adjusted Level of Significance (β)	0.0437		
Approximate Chi Square Value (13.32, α)	6.106	Adjusted Chi Square Value (13.32, β)	5.914
95% Gamma Approximate UCL	9.986	95% Gamma Adjusted UCL	10.31

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.048	SD (KM)	13.88
Variance (KM)	192.5	SE of Mean (KM)	2.357
k hat (KM)	0.132	k star (KM)	0.139
nu hat (KM)	10.32	nu star (KM)	10.86
theta hat (KM)	38.14	theta star (KM)	36.25
80% gamma percentile (KM)	5.151	90% gamma percentile (KM)	14.79
95% gamma percentile (KM)	28.16	99% gamma percentile (KM)	67.59

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (10.86, α)	4.487	Adjusted Chi Square Value (10.86, β)	4.325
95% KM Approximate Gamma UCL	12.22	95% KM Adjusted Gamma UCL	12.67

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.966	Shapiro Wilk GOF Test
10% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.163	Lilliefors GOF Test
10% Lilliefors Critical Value	0.252	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Note GOF tests may be unreliable for small sample sizes

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	4.958	Mean in Log Scale	-0.189
SD in Original Scale	14.09	SD in Log Scale	1.631
95% t UCL (assumes normality of ROS data)	8.761	95% Percentile Bootstrap UCL	8.861
95% BCA Bootstrap UCL	10.91	95% Bootstrap t UCL	14.49
95% H-UCL (Log ROS)	7.347		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.118	KM Geo Mean	1.125
KM SD (logged)	1.351	95% Critical H Value (KM-Log)	2.837
KM Standard Error of Mean (logged)	0.232	95% H-UCL (KM -Log)	5.216
KM SD (logged)	1.351	95% Critical H Value (KM-Log)	2.837
KM Standard Error of Mean (logged)	0.232		

Note: KM UCLs may be biased low with this dataset. Other substitution method recommended

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	5.637	Mean in Log Scale	0.736
SD in Original Scale	13.87	SD in Log Scale	1.101
95% t UCL (Assumes normality)	9.381	95% H-Stat UCL	5.998

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL	9.022

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.
Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Total Organic Carbon (mg/kg)

General Statistics

Total Number of Observations	78	Number of Distinct Observations	72
Number of Detects	75	Number of Non-Detects	3
Number of Distinct Detects	71	Number of Distinct Non-Detects	1
Minimum Detect	1760	Minimum Non-Detect	1000
Maximum Detect	100000	Maximum Non-Detect	1000
Variance Detects	5.614E+8	Percent Non-Detects	3.846%
Mean Detects	38395	SD Detects	23694
Median Detects	35300	CV Detects	0.617
Skewness Detects	0.638	Kurtosis Detects	-0.125
Mean of Logged Detects	10.31	SD of Logged Detects	0.799

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.944	Normal GOF Test on Detected Observations Only
1% Shapiro Wilk P Value	0.00441	Detected Data Not Normal at 1% Significance Level
Lilliefors Test Statistic	0.0777	Lilliefors GOF Test
1% Lilliefors Critical Value	0.118	Detected Data appear Normal at 1% Significance Level

Detected Data appear Approximate Normal at 1% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	36957	KM Standard Error of Mean	2755
90KM SD	24173	95% KM (BCA) UCL	41615
95% KM (t) UCL	41544	95% KM (Percentile Bootstrap) UCL	41499
95% KM (z) UCL	41489	95% KM Bootstrap t UCL	41881
90% KM Chebyshev UCL	45223	95% KM Chebyshev UCL	48967
97.5% KM Chebyshev UCL	54165	99% KM Chebyshev UCL	64373

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.369	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.762	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0833	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.104	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.179	k star (bias corrected MLE)	2.101
Theta hat (MLE)	17620	Theta star (bias corrected MLE)	18277
nu hat (MLE)	326.9	nu star (bias corrected)	315.1
Mean (detects)	38395		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	1760	Mean	37087
Maximum	100000	Median	33550
SD	24142	CV	0.651
k hat (MLE)	1.893	k star (bias corrected MLE)	1.829
Theta hat (MLE)	19592	Theta star (bias corrected MLE)	20280
nu hat (MLE)	295.3	nu star (bias corrected)	285.3
Adjusted Level of Significance (β)	0.0469		
Approximate Chi Square Value (285.29, α)	247.2	Adjusted Chi Square Value (285.29, β)	246.5
95% Gamma Approximate UCL	42807	95% Gamma Adjusted UCL	42923

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	36957	SD (KM)	24173
Variance (KM)	5.843E+8	SE of Mean (KM)	2755
k hat (KM)	2.337	k star (KM)	2.256
nu hat (KM)	364.6	nu star (KM)	351.9
theta hat (KM)	15811	theta star (KM)	16382
80% gamma percentile (KM)	54544	90% gamma percentile (KM)	69888
95% gamma percentile (KM)	84423	99% gamma percentile (KM)	116436

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (351.93, α)	309.5	Adjusted Chi Square Value (351.93, β)	308.7
95% KM Approximate Gamma UCL	42029	95% KM Adjusted Gamma UCL	42130

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.932	**Shapiro Wilk GOF Test**
10% Shapiro Wilk P Value	6.5189E-4	Detected Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.112	**Lilliefors GOF Test**
10% Lilliefors Critical Value	0.0936	Detected Data Not Lognormal at 10% Significance Level

Detected Data Not Lognormal at 10% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	37099	Mean in Log Scale	10.24
SD in Original Scale	24126	SD in Log Scale	0.863
95% t UCL (assumes normality of ROS data)	41647	95% Percentile Bootstrap UCL	41645
95% BCA Bootstrap UCL	41655	95% Bootstrap t UCL	41705
95% H-UCL (Log ROS)	49978		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	10.18	KM Geo Mean	26323
KM SD (logged)	1.016	95% Critical H Value (KM-Log)	2.28
KM Standard Error of Mean (logged)	0.116	95% H-UCL (KM -Log)	57458
KM SD (logged)	1.016	95% Critical H Value (KM-Log)	2.28
KM Standard Error of Mean (logged)	0.116		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	36937	Mean in Log Scale	10.15
SD in Original Scale	24358	SD in Log Scale	1.114
95% t UCL (Assumes normality)	41529	95% H-Stat UCL	64479

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 1% Significance Level

Suggested UCL to Use

95% KM (t) UCL 41544

When a data set follows an approximate distribution passing only one of the GOF tests,
it is suggested to use a UCL based upon a distribution passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Aroclor 1248 1/2 RL for NDs (µg/kg)

General Statistics

Total Number of Observations	23	Number of Distinct Observations	19
		Number of Missing Observations	50
Minimum	20	Mean	53.22
Maximum	500	Median	32
SD	97.75	Std. Error of Mean	20.38
Coefficient of Variation	1.837	Skewness	4.739

Normal GOF Test

Shapiro Wilk Test Statistic	0.287	**Shapiro Wilk GOF Test**	
1% Shapiro Wilk Critical Value	0.881	Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.47	**Lilliefors GOF Test**	
1% Lilliefors Critical Value	0.209	Data Not Normal at 1% Significance Level	

Data Not Normal at 1% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	88.22	95% Adjusted-CLT UCL (Chen-1995)	108.3
		95% Modified-t UCL (Johnson-1978)	91.57

Gamma GOF Test

A-D Test Statistic	4.583	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.762	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.373	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.185	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.417	k star (bias corrected MLE)	1.261
Theta hat (MLE)	37.55	Theta star (bias corrected MLE)	42.19
nu hat (MLE)	65.19	nu star (bias corrected)	58.02
MLE Mean (bias corrected)	53.22	MLE Sd (bias corrected)	47.39
		Approximate Chi Square Value (0.05)	41.51
Adjusted Level of Significance	0.0389	Adjusted Chi Square Value	40.49

Assuming Gamma Distribution

95% Approximate Gamma UCL	74.39	95% Adjusted Gamma UCL	76.25

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.602	**Shapiro Wilk Lognormal GOF Test**	
10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.256	**Lilliefors Lognormal GOF Test**	
10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level	

Data Not Lognormal at 10% Significance Level

Lognormal Statistics

Minimum of Logged Data	2.996	Mean of logged Data	3.582
Maximum of Logged Data	6.215	SD of logged Data	0.626

Assuming Lognormal Distribution

95% H-UCL	57.82	90% Chebyshev (MVUE) UCL	61.28
95% Chebyshev (MVUE) UCL	69.42	97.5% Chebyshev (MVUE) UCL	80.72
99% Chebyshev (MVUE) UCL	102.9		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution

Nonparametric Distribution Free UCLs

95% CLT UCL	86.74	95% BCA Bootstrap UCL	116.7
95% Standard Bootstrap UCL	87	95% Bootstrap-t UCL	354.7
95% Hall's Bootstrap UCL	237.5	95% Percentile Bootstrap UCL	93.83
90% Chebyshev(Mean, Sd) UCL	114.4	95% Chebyshev(Mean, Sd) UCL	142.1
97.5% Chebyshev(Mean, Sd) UCL	180.5	99% Chebyshev(Mean, Sd) UCL	256

Suggested UCL to Use

95% Student's-t UCL	88.22

The calculated UCLs are based on assumptions that the data were collected in a random and unbiased manner.
Please verify the data were collected from random locations.
If the data were collected using judgmental or other non-random methods,
then contact a statistician to correctly calculate UCLs.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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