FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL

April 15, 2020

Mr. Kevin McKnight
Wisconsin Department of Natural Resources
625 E. County Road Y, Suite 700
Oshkosh, WI 54901

RE: WPDES Permit for Soil Mixing and Treatment, Remedial Action
Bay Towel Remediation
501 S. Adams Street
Green Bay, WI
BRRTS # 02-05-237064

Dear Kevin:

Attached are the following completed and signed materials:

- Request for Coverage Under WPDES Application Form
- Determination Checklist for Contaminated or Uncontaminated Groundwater Remedial Actions
- Remediation Description from the Approved Remedial Action Plan
- $700 Injection Permit Fee

Planned Remedial Excavation, Chemicals and Processes

Historic laboratory results indicated most of the soil contamination mass resided in the boundaries shown on the attached map (Figure 1). The proposed "hot-spot" excavation areas will be marked using marking paint to guide the backhoe operator. Prior to excavation, public and private utilities will be marked by Diggers Hotline and a private utility locating contractor. Additionally, groundwater monitoring well SMW-1 will be abandoned prior to excavation activities as it is located in the main excavation. An abandonment form will be completed for groundwater monitoring well SMW-1.

The remedial excavation is proposed to remove contaminated soil containing PCE and TCE. The excavation is planned to be to 30-feet below grade at the maximum. The excavation is planned to go below the water table interface, but groundwater is not expected to enter the excavation. The site water table surface was monitored for years during the investigation and ranges from approximately 4-8 feet below grade. The tight silty clay formation and planned late fall/winter excavation activities will most likely prevent the accumulation of water in the excavation base, as it has in previous excavations. However, if groundwater infiltration occurs or if rainwater accumulates, Covanta Environmental Solutions (Covanta) will remove any water prior to excavation or backfilling activities via vacuum truck and properly dispose of the water per state code.

Previous remedial excavations at the site extended to depths of 5-14 feet below grade and were backfilled with clean crusher run rock chips and bank run sand and gravel with traffic bond silty gravel near the surface to present grade. In these areas where clean backfill is known to be present, the excavation contractor will excavate approximately 3,100 tons and stage onsite to be beneficially reused to backfill the current remedial excavation.

An estimated 2,300 tons of contaminated soil from two different areas will be excavated and direct hauled to Waste Management's Ridgeview Security LandfillI in Whitelaw, Wisconsin. In areas with higher concentrations of drycleaning solvent, from 14-25-feet below grade, the soils are considered hazardous in the central excavation area. These soils, approximately 1,200 tons, will be excavated and placed into approximately 14 roll-off boxes over two events (28 total roll-off boxes). The soil in the roll-off boxes will be treated using Fenton's reagent and BAM™ from Orin Remediation Technologies in Verona, Wisconsin. All soil will be treated by a combination of continuously mixing the impacted soils with an excavator while simultaneously applying the preferred treatment chemicals. The oxidant will be sprayed directly onto the soils until the desired amount of oxidant is thoroughly incorporated. A backhoe will mix the BAM™ with the treated soils to complete the oxidation reaction and to assist in stabilization of the treated, saturated soils.

Three grab samples from each box will be analyzed for volatile organic compounds (VOCs) and toxicity characteristic leaching procedure (TCLP) VOC analysis. The grab samples will be collected from discrete sample locations/depths in each box (i.e., the soil samples will not be composite samples). For disposal approval of the treated soil at a licensed Subtitle D facility in Wisconsin, the treated soil must display results that are below the following threshold values:

A. The sum of all detected individual VOCs must fall below 60 mg/kg (or 60,000 ug/kg) to meet concentrations that are 10 times the land disposal restriction (LDR). Demonstration that the total VOC concentration declined by 90 percent or more due to the treatment process would also meet the disposal restriction but at this time it does not appear there is adequate pre-treatment information to accurately assess the level of decrease in the soil via the treatment procedure.

B. The soil must meet the "contained out values," which include the following for these soils:
    - PCE – 153,000 ug/kg
    - TCE – 8,800 ug/kg
    - VC – 2,000 ug/kg

C. The soil must be accepted by the landfill, which typically requires that the soil pass the characteristic test for TCLP. For these soils, the TCLP criteria include the following:
    - PCE – 0.7 mg/l in leached extract
    - TCE – 0.5 mg/l in leached extract
    - VC – 0.2 mg/l in leached extract

Upon receipt of an acceptable amount of data that demonstrates compliance with these criteria, the treated material can be approved for landfill disposal at a Subtitle D facility by the Wisconsin Department of Natural Resources (WDNR). Once the WDNR indicates the material is acceptable for disposal, the landfill will accept the material for hauling and disposal.

Upon excavation completion, an estimated 25 sidewall/perimeter soil samples will be retained from the remedial excavation to document the final soil chemistry results from the excavation walls. Base samples will not be retained as previous soil chemistry results can be used to document the remaining in place soil chemistry concentrations. Soil samples will be retained for laboratory analysis of VOCs.

After soil samples have been retained, BAM™ will be applied to the base of the soil excavation and backfilled with geotechnically suitable materials. Backfill will consist of American Association of State Highway and Transportation Officials (AASHTO) #57 clean clear stone (no fines) as fill material for the basal 18-feet, followed with dense base aggregate material and density testing on each lift for the remaining 11-feet to 1-foot below finished grade, with traffic bond material to be placed from 1-foot to finished grade.

In order to confirm the adequacy of compaction of the backfill materials, a Proctor test will be performed on the proposed fill materials prior to backfilling. The established Proctor density of the fill will then be used in conjunction with field densities established via density testing to determine compaction levels being achieved. Compaction testing verification will be performed in 1-foot lifts using a rolling vibratory compactor from 11-feet below grade to the surface.

To note, AASHTO #57 clean clear stone (no fines) will not be tested or compacted. Compaction testing of AASHTO #57 clean clear stone with a nuclear gauge or other device is not possible, even though many specifications state that it should be compacted to 95 percent of Proctor values. So rather than compaction tests, the AASHTO #57 clean clear stone should have its individual stone facets properly oriented using a plate compactor, jumping jack, or other vibratory compaction device. Using compaction equipment, the AASHTO #57 stone will typically compact about 1 inch in vertical height, which is equivalent to about an 8 percent settlement. This can be visually observed and verified. Compaction of this layer will comply with the geotechnical engineer’s recommendations.

Utilities

Removal of all private underground utilities occurred within the 2016 excavation footprint areas to facilitate the dig and mixing operations.

Upon completion of the 2016 excavation, bentonite clay plugs were installed at the terminus of the excavation area surrounding the storm sewer, sanitary sewer, and water lines, at the location closest to the point that they exit the building on the east.

Additionally, because there is no pressure injection at this site, and merely spray on chemical addition, no migration of sprayed-on chemicals along utility corridors is expected to take place.

Proposed Monitoring During Injection

Since added chemicals are not being pressure injected and surface sprayed, and since the chemicals are being excavated and removed shortly after addition, only minimal monitoring for potential off-site chemical contaminant migration is planned. Monitoring well SMW-1, in the heart of the excavation and treatment area, will be properly abandoned and removed during the remediation and restored upon completion of backfilling. The rest of the monitoring well network will remain in place (Figure 2).

During days when chemical additions occur in the excavation, headspace measurements from the monitoring well network will be monitored with a four-gas meter, for percent oxygen, percent carbon dioxide, hydrogen sulfide, and percent of the lower explosive limit. Measurements of these parameters will be performed once per day from all the above locations except SMW-1, which will have been removed.

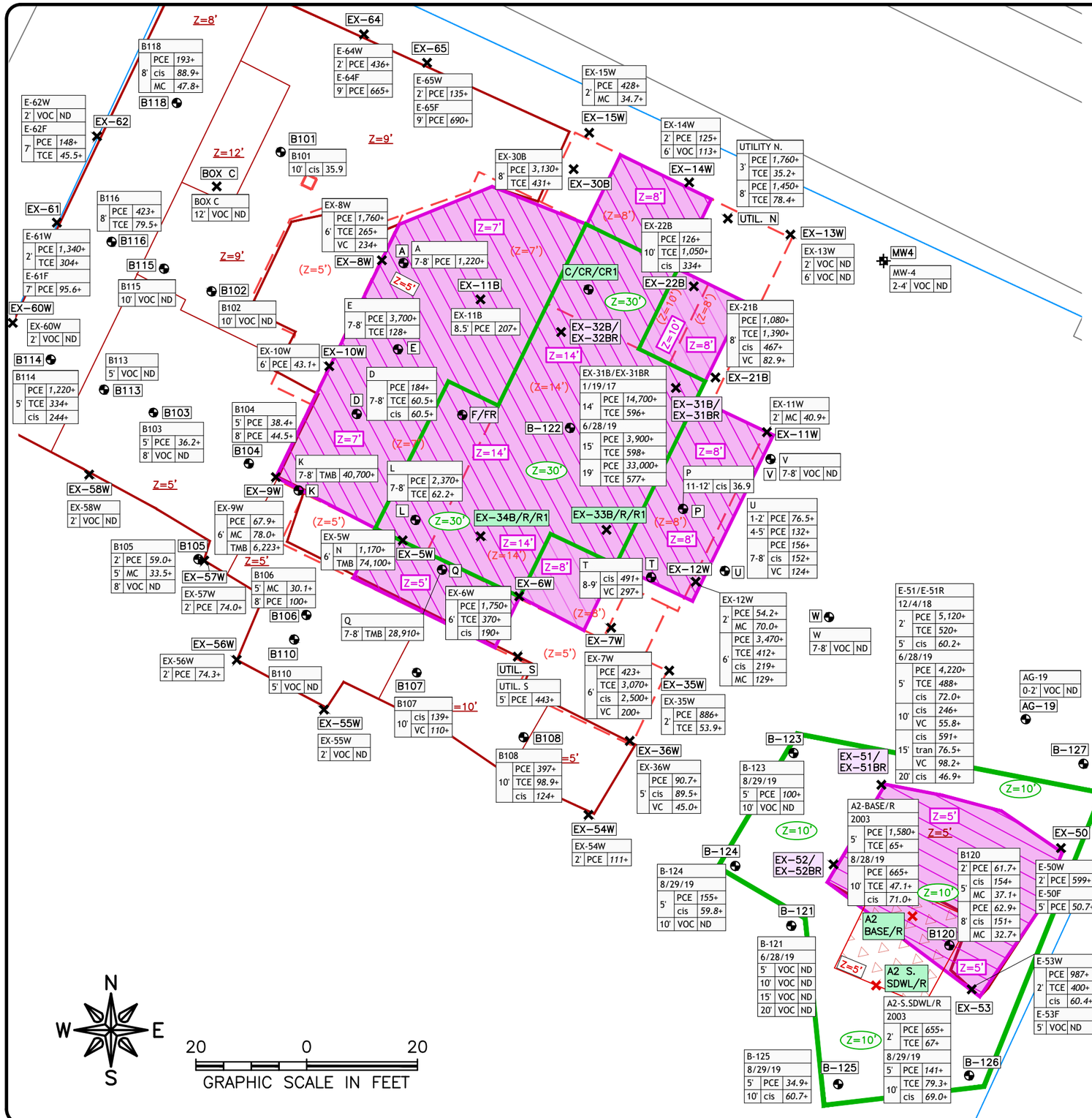
Post-remediation groundwater sampling will be completed upon conclusion of the excavation and backfilling, in which a final round of measurements for the gas parameters also will be recorded.

I trust these documents meet your needs, and you have enough information to issue the permit. If you need additional information, please call and let me know. We hope to begin the remedial action in May 2020 and look forward to hearing from you.

Sincerely,

Matt Dahlem, PG
Branch Manager

cc: Ms. Josie M. Schultz, WDNR, 2840 Shawano Avenue, Green Bay, WI 54313-6727 w/ Attachments



LEGEND

- SOIL BORINGS (SOIL REMAINING ONSITE)
- EXCAVATION SAMPLE (SOIL REMAINING ONSITE)
- ACTIVE MONITORING WELL
- ACTIVE PIEZOMETER
- EX-31B/ EX-31BR — SAMPLE LOCATION RE-DRILLED & SAMPLED
- EX-34B/R/R1 — SAMPLE LOCATION RE-DRILLED & SAMPLED AT DEEPER DEPTHS
- 2003 ARCADIS EXCAVATION
- (Z=5') — 2016 FEHR GRAHAM EXCAVATION & DEPTH
- Z=5' — 2018 FEHR GRAHAM EXCAVATION & DEPTH
- Z=20' — CLEAN SOIL TO BE STAGED & DEPTH
- Z=30' — PROPOSED EXCAVATION & DEPTH AFTER CLEAN SOIL REMOVED & STAGED

0-2'	SAMPLE DEPTH
PCE	TETRACHLOROETHENE (ug/kg)
TCE	TRICHLOROETHENE (ug/kg)
cis	cis-1,2-DICHLOROETHENE (ug/kg)
tran	trans-1,2-DICHLOROETHENE (ug/kg)
VC	VINYL CHLORIDE (ug/kg)
MC	METHYLENE CHLORIDE (ug/kg)
TMB	TRIMETHYLBENZENE, TOTAL (ug/kg)
VOC	VOLATILE ORGANIC COMPOUNDS
ND	NO DETECT
DBS	DETECTIONS BELOW STANDARDS
ITALICS+	EXCEEDS GROUNDWATER PATHWAY RCL
BOLD++	EXCEEDS NON-INDUSTRIAL DIRECT CONTACT (0-4') RCL
ITALICS/ BOLD++	EXCEEDS BOTH GROUNDWATER & DIRECT CONTACT RCL

SOIL CHEMISTRY OF RE-SAMPLED AREAS

C/CR/CR1	
6/28/16	
7-8'	PCE 18,000+
	TCE 2,640+
	cis 873+
6/28/19	
15'	VOC ND
20'	PCE 233,000+
	TCE 3,950+
25'	PCE 74,900+
	TCE 3,120+
8/28/19	
30'	VOC ND
35'	VOC ND
40'	PCE 3,790+
F/FR	
6/28/16	
7-8'	PCE 5,860+
	TCE 1,270+
	cis 18,600+
6/28/19	
15'	cis 83,900+
	tran 1,540+
	VC 14,100+
20'	PCE 178+
	cis 49.3+
	VC 61.8+

EX-32B/EX-32BR	
1/19/17	
14'	PCE 20,700+
	TCE 1,900+
	cis 133+
6/28/19	
20'	PCE 19,000+
	TCE 870+
EX-33B/BR/BR1	
1/23/17	
14'	PCE 137,000+
	TCE 2,510+
6/28/19	
20'	PCE 56,200+
	TCE 10,800+
	cis 960+
24'	PCE 115,000+
	TCE 4,610+
8/28/19	
15'	VOC ND
30'	VOC ND
35'	VOC ND
40'	VOC ND

EX-34B/BR/BR1	
1/23/17	
14'	PCE 177,000+
	TCE 5,910+
	cis 758+
6/28/19	
20'	PCE 85,200+
	TCE 1,540+
8/28/19	
25'	PCE 831+
	TCE 58.2+
30'	VOC ND
35'	VOC ND
40'	VOC ND
E-52/E-52R	
12/4/18	
2'	PCE 28,900+
	TCE 2,740+
	cis 973+
5'	PCE 846+
	TCE 65.8+
	cis 59.4+
6/28/19	
5'	PCE 336+
	TCE 34.1+
10'	cis 496+
15'	VOC ND
20'	VOC ND

B-122	
8/29/19	
15'	PCE 225,000+
	TCE 9,920+
	cis 3,500+
20'	PCE 164+
25'	VOC ND
30'	PCE 72.4+
35'	PCE 37.1+
40'	PCE 57.8+
45'	VOC ND
50'	VOC ND
B-126	
8/29/19	
2'	PCE 408+
	TCE 67.7+
5'	VOC ND
10'	PCE 59.3+
	TCE 66.8+
	cis 51.2+
B-127	
8/29/19	
2'	VOC ND
5'	VOC ND
10'	VOC ND

FEHR GRAHAM ENGINEERING & ENVIRONMENTAL — ILLINOIS IOWA WISCONSIN

BAY TOWEL-SOLVENT INVESTIGATION
501 S. ADAMS ST.
GREEN BAY, WI 54301
DRWN: MKH DATE: 10/21/15 APPD: KE

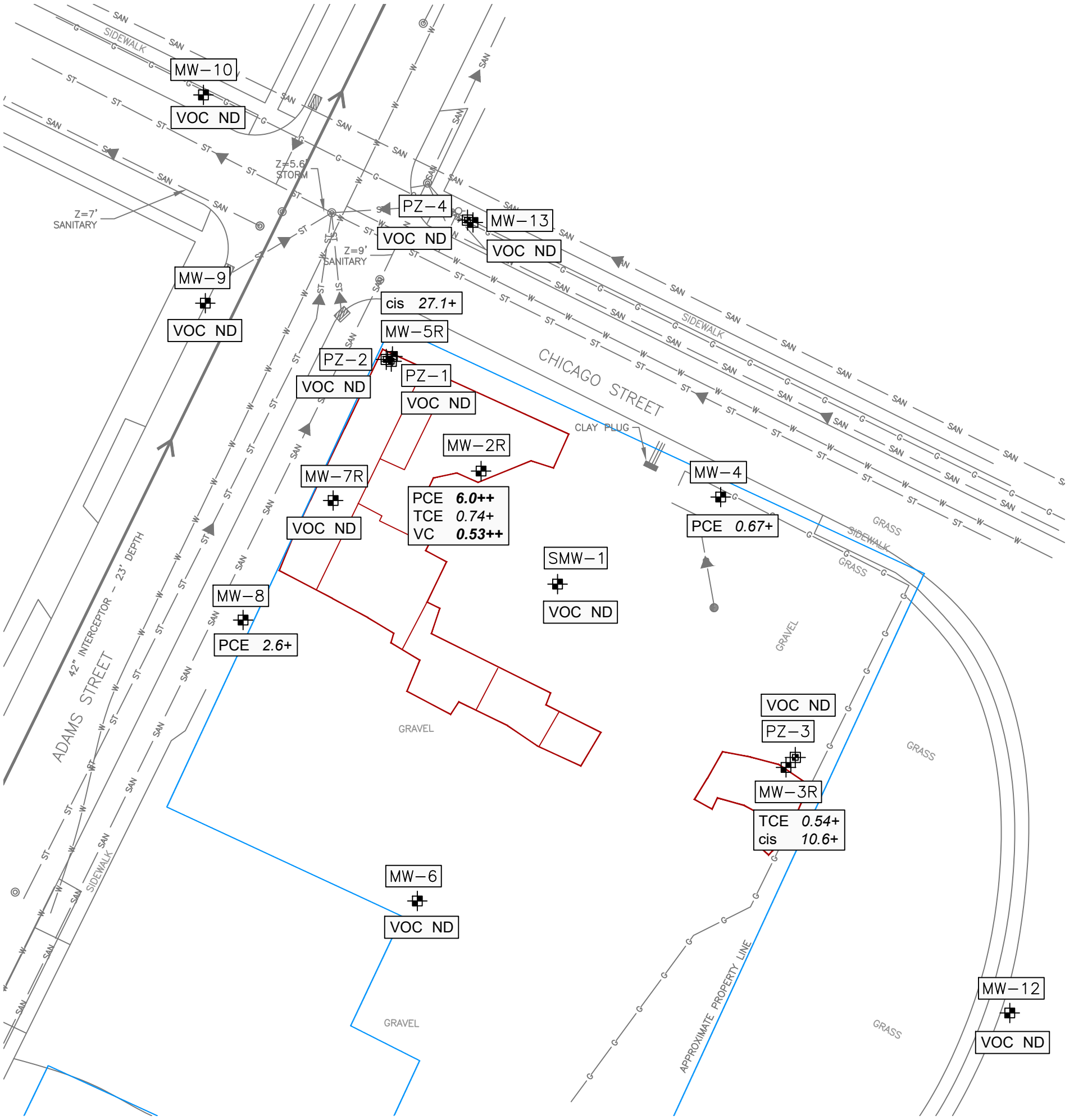
TITLE:

REMAINING SITE SOIL CHEMISTRY

BRRTS: 02-05-237064
JOB NO.: 16-1304
PLOT DATE: 9/27/19

FIGURE: 1

G:\C3D\16\16-1304 Bay Towel\Exhibits\16-1304_BaseMap-Bay Towel.dwg, SOIL CHEM 8.29.19



LEGEND

- MONITORING WELL
- PIEZOMETER
- SOIL EXCAVATION (FEHR GRAHAM 2018)

PCE	TETRACHLOROETHENE (ug/L)
TCE	TRICHLOROETHENE (ug/L)
cis	cis-1,2-DICHLOROETHENE (ug/L)
VC	VINYL CHLORIDE (ug/L)
ND	NO DETECT
DBS	DETECTIONS BELOW STANDARDS
VOC	VOLATILE ORGANIC COMPOUNDS
ITALICS+	EXCEEDS NR140 PREVENTIVE ACTION LIMIT
BOLD++	EXCEEDS NR140 ENFORCEMENT STANDARD
BOLD/ITALICS++	EXCEEDS BOTH ES & PAL

N W E S

40 0 40
GRAPHIC SCALE IN FEET

FEHR GRAHAM ENGINEERING & ENVIRONMENTAL
ILLINOIS IOWA WISCONSIN

BAY TOWEL–SOLVENT INVESTIGATION
501 S. ADAMS ST.
GREEN BAY, WI 54301
DRWN: MKH DATE: 10/21/15 APPD: KE

TITLE: GROUNDWATER CHEMISTRY JUNE 28, 2019

BRRTS: 02–05–237064
JOB NO.: 16–1304
PLOT DATE: 7/8/19

FIGURE: 2

G:\C3D\16\16–1304 Bay Towel\Exhibits\16–1304_BaseMap–Bay Towel.dwg, GW CHEM 6.28.19

DETERMINATION CHECKLIST FOR CONTAMINATED OR UNCONTAMINATED GROUNDWATER REMEDIAL ACTIONS (rev 8/97)

DNR WILL COMPLETE SHADED SECTIONS

NAME/ADDRESS OF FACILITY: Former Bay Towel, 501 S. Adams Street, Green Bay, WI

HIGHEST MONTHLY AVERAGE DISCHARGE FLOW RATE: NONE VACANT STRUCTURE GPM, _____ GPD, _____ CFS

A. Applicability criteria - discharge character/pollutants

1. Type of wastewater and possible sources of pollutants:

   No Wastewater - Proposal to add chemicals (Fenton's Reagent and BAM - biomass solid with high carbon content) via spray to soil, mix, then excavate mixture and landfill. Also ad ABC+ - lactic acid and iron) to excavation base after excavation complete.

2. Categories of pollutants tested/scanned:

   None in added materials

3. Priority pollutants identified: *(check all that apply)*

   _____ OK - pollutants are properly regulated by the general permit
   - _____ BETX (Benzene, Ethylbenzene, Toluene, Xylene)
   - _____ Other Petroleum Products - type:_____
   - _____ PAH's (Polynuclear aromatic hydrocarbons incl. Naphthalene)
   - _____ Lead (Tetraethyl lead is an octane booster)
   - X VOC's (Volatile Organic Chemicals) Existing in soil and groundwater - not to added

   _____ PROBLEM - general permit does not have limits to properly regulate discharges of these pollutants *(have facility change discharge or draft an individual permit when limits are needed)*
   - _____ Other NR 105 metals, cyanide or phenols
   - _____ Pesticides to surface waters
   - _____ GC/MS Acids
   - _____ GC/MS Base Neutrals (except Polynuclear Aromatic Hydrocarbons)
   - _____ Others (Acrylonitrile, NH_3, Cl^-, etc.)

4. Are any bioaccumulating substances listed on page 2 of GP present?

   _____ YES Facility is not eligible for general permit
   X NO Continue with checklist to determine eligibility

A. Applicability Criteria - Receiving Water:

1. Aquatic Use Classification:

2. Mean Annual Flow: _____cfs *(data or drainage basin estimate)*

3. Any downstream higher quality waters that could be impacted?

_____ YES Use additional worksheet to evaluate downstream impacts
_____ NO Continue with checklist to determine eligibility

4. Does discharge flow to (or impact downstream) Outstanding Resource Waters?

_____ YES Facility is not eligible for general permit *[Issue specific permit or change discharge. For "existing" discharges (previously covered under the general permit), no 207 review is needed; for new or increased discharges, a 207 review is necessary].*
_____ NO Continue with checklist to determine eligibility

5. Does discharge flow to waters classified for Public Water Supply?

_____ YES Facility is not eligible for general permit *[Issue specific permit for discharge. For "existing" discharges (previously covered under the general permit), Water Resource Management review is needed to make sure NR 105/106 limits are included in the specific permit].*
_____ NO Continue with checklist to determine eligibility

6. Does discharge flow to (or impact downstream) Exceptional Resource Waters?

_____ YES *(check appropriate line below)*
_____ Facility is eligible for the permit if the purpose of discharge is to prevent or correct an existing groundwater contamination situation or a public health problem *(see NR 207.04(1)(c)1.*
_____ Existing discharges with no increase in flow are eligible
_____ Otherwise, the facility is not eligible for the permit *(and a site specific permit shall be individually drafted).*
_____ NO Receiving water is not an Exceptional Resource water. *(Continue with checklist to determine eligibility).*

7. Does discharge flow to waters classified as a wetland?

_____ YES Facility may still be eligible for general permit if the Department determines that the facility's discharge meets the wetland protection requirements of ch. NR 103.
_____ NO Continue with checklist to determine eligibility

B. REQUIREMENTS FOR ALL DISCHARGERS

1. Is the contaminated groundwater discharged directly without any treatment for removal of pollutants?

_____ YES Facility is not eligible for general permit, treatment is required
X NO Continue with checklist to determine eligibility

NO DISCHARGE OF CONTAMINATED GROUNDWATER

2. Is there a discharge management plan to approve?

_____ YES Use the discharge management plan approval (paragraph in the cover letter) to exempt the facility from monitoring certain contaminants that data has shown will not be present in the effluent, require additional monitoring for something in NR 105 or 140 that is not listed in the permit, or approve alternate limits for seepage.

_____ NO Specify (in the cover letter) that all parameters in appropriate section of the GP are required to be monitored, but the facility may sumbit a future discharge management plan to delete substances from monitoring.

3. Are any harmful, not approved chemical cleaning or water treatment additives proposed to be discharged under this general permit?

_____ YES Facility is not eligible for general permit because the additives used are not approved under the general permit; *specific permit or change in discharge or additive use is needed.*

X NO Facility is eligible for general permit because:

_____ None are used

_____ Type and amount of additive listed on application are allowable under general permit. *(Contact IWW/Madison for approved additives)*

_____ Treatment cleaning solutions are properly discharged offsite (such as POTW)

_____ Facility uses chlorine, but can meet the "no detect" permit limit for discharge *(monitoring for trihalomethanes may be required).*

Notes on additive use or cleaning system at this facility:
Will mix Fenton's Reagent (hydrogen peroxide and sulfuric acid/ferrous sulfate, plus will add BAM - organic carbon source) with site soil to drop concentrations of PCE below levels that prevent landfill disposal. Will then excavate soil and landfill. Additions done via spray, and soil to be removed following mixing, so chemicals not remaining in subsurface longer than a couple days.

4. pH: Does the discharge pH fall outside of 6.0 - 9.0 s.u.?
NO DISCHARGE

_____ YES Facility is not eligible for general permit. *(Issue specific permit or change discharge)*

X NO Facility is eligible for general permit. *(Continue with checklist to determine eligibility)*

5. Have other programs been informed to check on the need for other permits/approvals?
NA : WDNR Bureau of Remediation and Redevelopment has approved the plan

_____ YES Air management staff are informed; a permit is issued if needed; benzene emissions of greater than 300 lbs/year requires a permit.

_____ YES Water Reg/Zoning is informed of any outfall work below the high water mark. Facility is aware that local storm sewer may be needed.

_____ NO Send a copy of this checklist or the permit application to appropriate program.

C&D. EFFLUENT LIMITS AND MONITORING REQUIREMENTS FOR DISCHARGES TO SURFACE WATERS

1. Suspended Solids: Is it likely that the effluent will exceed 40 mg/L TSS?
NO EFFLUENT

_____ YES Facility is not eligible for general permit. *(Issue specific permit or change discharge)*

X NO Facility is eligible for general permit. *(Continue with checklist to determine eligibility under other parameters)*

2. Petroleum Product Remediations

a. Can the facility comply with the free product separation requirement, the 50 ug/L Benzene limit, 70 ug/L Naphthalene limit, and the total BETX limit of 750 ug/L?

X YES Facility is eligible for general permit.
_____ NO Facility is not eligible for general permit. *(Issue specific permit or change discharge)*

b. Can the facility comply with the total recoverable lead limit set at 1/3 of the remaining assimilative capacity. Calculate the lead limit based on the receiving water hardness, background lead conc, $3Q_{7,10}$ and Q_e. Use the calculation formula on page 7 of the permit, of quatro pro spread sheet located in P:\general\reissue\gw\Pbcalc.wb2. Include the numerical lead limit in the cover letter (don't expect the facility to calculate it). Don't put a weekly ave. lead limit higher than the 50 ug/L daily maximum limit (BAT) in the cover letter.

_____ YES Facility is eligible for general permit.
_____ NO Facility is not eligible for general permit. *(Issue specific permit where full assimilative capacity limit is possible or change treatment to require more aggressive filtering)*

c. Has testing of the treatment system influent revealed detectable quantities of polynuclear aromatic hydrocarbons using EPA method 8310 HPLC?
NA : NO SYSTEM INFLUENT

_____ N/A Not applicable to gasoline (only) remediations
_____ YES Facility will not be able to remove PAH's to less than detectable levels, and will not be able to comply with GP limit *(Issue specific permit or change discharge)*
_____ YES Facility is eligible for general permit, but treatment will be provided to remove PAH's to not detectable levels.
_____ NO Facility is eligible for general permit. *(Monitoring for PAH's may be required during permit life)*

d. Is the discharge expected to exceed the daily maximum oil and grease limit of 10 mg/L?
NA : NO DISCHARGE

_____ N/A Not applicable to gasoline (only) remediations
_____ YES Facility is not eligible for general permit. *(Issue specific permit or change discharge)*
_____ NO Facility is eligible for general permit. *(Monitoring for PAH's may be required during permit life)*

3. Volatile Organic Chemical Remediations

a. Any stream background data for the VOC's in the discharge?

____ YES Subtract the background value from the criteria to find the remaining assimilative capacity
____ NO Assume non-detectable background or request testing

b. Calculate the theoretical instream concentration for each pollutant using the general permit limit: (attach sheet w/calculations for all pollutants)

$$\frac{\text{(GP Limit) x (Effluent Flow)}}{\text{(3 harmonic mean stream flow + Effluent Flow)}} = \text{instream pollutant concentration}$$

c. Will the calculated instream pollutant concentration exceed 1/3 (NR 207 not significant lowering) of the remaining assimilative capacity (water quality criteria minus background level) for the aquatic use classification listed in the table?

_____ YES Facility is not eligible for general permit. *(Issue specific permit with mass limits or change discharge)*

_____ NO Facility is eligible for general permit. *(Specify in the cover letter which VOC's will be required to be monitored)*

d. note: If there are no limits in the GP for VOC's in the discharge, the need for a permit limit can be checked by substituting [the water quality criteria] for [the instream pollutant concentration] in the formula above to solve for what the potential [permit limit] would be. As long as the discharge level would be less that 20% of the potential permit limit, an numerical limit is not needed and the general permit can be used. If the discharge level is above 20% (or the p99) of the water quality based limitation, an individual permit must be drafted to contain the water quality based limit. Alternatively, the treatment system could be redesigned to reduce the effluent concentration such that the discharge is again eligible for the general permit.

E. EFFLUENT LIMITS AND MONITORING REQUIREMENTS FOR DISCHARGES TO GROUNDWATERS.

Effluent limits and monitoring requirements for groundwater discharges are established in the permit at a level equivalent to the preventive action limit to assure compliance with Ch. NR 140 groundwaterquality standards. The permittee may submit (and the field DNR wastewater staff may approve) a demonstration in discharge managemnt plan that justifies that limits up to the enforcement standard are needed due to technical or economic infeasibility. Approve the alternate limits in your approval of the discharge management plan. The cover letter shall specify the preferred method of documenting compliance with the groundwater standards, such as: (1) meeting PAL or ES in samples from groundwater monitoring wells, (2) meeting PAL or ES in samples of wastewater treatment effluent before discharge, or (3) by meeting end-of-pipe wastewater discharge limits that are back calculated (for effects of pollutant dilution, dispersion of degradation) to comply with ground water standards.

F. EFFLUENT LIMITS AND MONITORING REQUIREMENTS FOR DISCHARGES TO IN SITU REMEDATION OF GROUNDWATERS

Effluent limits and monitoring requirements for groundwater discharges are established in the permit at a level equivalent to the preventive action limits unless a Temporary Exemption under Ch. NR 140.28(5) is granted by the DNR Remediation and Response Program. The ERR NR 140 temporary exemption must set maximum seepage/injection levels to protect surrounding groundwater. Above ground treatment (air stripping) is generally required of these projects to reduce the risk of contaminated groundwater moving outside the plume area. You are encouraged to call Jeff Brauer at (608) 267-7643, Steve Karklins at (608) 266-5240, or your Regional hydrogeologist if you get involved with one of these projects.

G. REQUIREMENTS FOR AG-CHEM SITE DISCHARGES TO FARM FIELDS

In most cases farm Coop sites with pesticides and fertilizers should be encouraged to reuse the remediation wastewater when the are mixing up pesticide batches or when they can irrigate of landspread the waters for beneficial use on farm fields. When these sites are considering surface water discharge, Best Available Treatment generaly requires activated carbon to be used and there are difficult issues with regard to Ammonia-Nitrogen affects on aquatic life. Often there may be no assimilative capacity remaining for ammonia and the stream classification (or lack of any formal classification resulting in a default full fish class) causes difficult permitting problems. For those reasons the general permit should not be used on Ag-chem remediation discharges to surface waters.

Is this facility eligible for the general permit?

_____ YES *(see reasons checked above)*
_____ NO *(see reasons checked above)*

Special considerations at this facility:

Wastewater Reviewer Sign _____ Date: _____

Basin Biologist/WQ limit spec Approval _____ Date: _____

Date Received_____
(Leave blank)

Request for Coverage Under
Wisconsin Pollutant Discharge Elimination System (WPDES)
Wastewater Discharge Permit (WI-0046566-06) for
Contaminated Groundwater from Remedial Action Operations

(Revised 8 / 2012)

Please type or print required information, except for the signature.

I. GENERAL INFORMATION

A: FACILITY LOCATION INFORMATION	
Name of Facility / Project BAY TOWEL - SOLVENT INVESTIGATION	Official Representative Onsite Title Vacant – contact consultant or owner
(Address or Highway / Road with Distance and Direction from nearest City) 501 S. Adams Street	Telephone No.: Fax # Vacant - None
City, State, Zip Code Green Bay, WI	County Email Address Brown None

B: Individual, parent company, or organization with direct control over the facility. Enter full official legal name of the owner or parent company, if there is one, the mailing address, and the name and title of the official representative (responsible party) signing this application if he/she is located at address of parent company.	
Parent Company/Owner Bay Towel	Company Contact Title Mr. John Butz President
Mailing Address - PO Box, Street, or Route 2580 S. Broadway, P.O. Box 12115	Telephone No.: Fax # 920 497-2000
City, State, Zip Code Green Bay, WI 54307-2115	Email Address Jbutz@baytowel.com

C: Consulting Firm for Groundwater	
Company Name Fehr Graham	Company Contact Title Matt Dahlem Branch Manager
Mailing Address - PO Box, Street, or Route 909 North 8th Street, Suite 101	Telephone No.: Fax # (920) 453-0700 (920) 453-0750
City, State, Zip Code Sheboygan, WI 53081	Email Address mdahlem@fehr-graham.com

D. **Name of Person to Receive Discharge Monitoring Report Forms** from Department:

Matt Dahlem, Fehr Graham

E. **Any Other Necessary Contact Person** (name, phone, email)

_____

F. **DNR Environmental Response & Repair Project Number, and DNR Project Manager name:**

BRRTS # 02-05-237064_ Josie M. Schultz

II. SPECIFIC INFORMATION ON PROJECT

A. Pollutants

1. The suspected **sources of the pollutants** (estimate of material release quantity and contributing activities)

Tetrachloroethene and related breakdown products. Source from incidental releases from operations as drycleaning facility, cleaning filters, wet transfer, product delivery, former tanks, etc. In areas with higher concentrations of drycleaning solvent, from 14-feet to 25-feet below grade, the soils are considered hazardous in the central excavation area. These soils equate to approximately 1,200 tons.

2. Check **all fuel and waste types** suspected in the contamination at this site:

☐ Unleaded Gasoline	☐ Jet Fuel	☐ Pesticides
☐ Leaded Gasoline	☐ Waste Oil	☐ Fertilizers
☐ Diesel Fuel	☒ Solvents	
☐ Heating Oil	☐ Other:	

3. Check **all pollutants identified at this site**:

BETX (Benzene, Ethylbenzene, Toluene, Xylene)	☐ Pesticides/Fertilizers
☐ PAHs (Polynuclear aromatic hydrocarbons)	☐ Total Recoverable Lead *
☒ VOCs (Volatile Organic Chemicals)	☐ Other_____

* Include upstream receiving water hardness analysis if lead is detected.

B. Treatment

Treatment Techniques Used

- ☐ Pump & Treat
  - ☐ Air stripping
  - ☐ GAC (Granular Activated Carbon)
- ☐ Augmented Insitu Bioremediation (with chemicals or nutrient addition)
- ☐ Other (describe)

1. **Describe the existing treatment system**:

Sprayed on to excavation soils and mixed, a solution of Fenton's reagent (mix of hydrogen peroxide and sulfuric acid / ferrous sulfate), then BAM (a high biomass solid with 90% carbon, 10% minerals).

Following mixing, soil will be placed in rolloff boxes, allowing for reaction time. Three grab samples from each box will be analyzed for VOC and TCLP VOC analysis. If below acceptable concentrations, soil will be profiled and need to be accepted by landfill and WDNR for disposal. Material will then be taken to a subtitle D landfill for disposal. If not acceptable, additional Fenton's and / or BAM will be added and the material retested until it can be landfilled. After excavation completed, will add BAM in the exaction base.

2. **If any cleaning, softening or descaling of the treatment system**

a. Identify any additives that are proposed or being used for cleaning, softening, or descaling of the treatment system. Provide Safety Data Sheets, and describe dosage.

Soil mixing will use Fentons Reagent and BAM. A 34% hydrogen peroxide container will be delivered to the site, later diluted 25% for application. The peroxide will be mixed with iron sulfate heptahydrate and sulfuric acid (93%). The iron sulfate heptahydrate and sulfuric acid will be diluted and applied at 0.42% and 0.47%, respectively. An estimated 4,000 gallons of Fentons Reagent will be added, along with 108 cubic yards of BAM. Attached are SDSs for these materials. BAM is a proprietary carbon source that will also be added to help bind residual solvents. After the soil excavation has been completed, an estimated 28 cubic yards of BAM will be mixed into the soil at the excavation base.

b. Describe what is done to clean, soften or descale, and how often it is done.

N/A

c. Where is the reject water from cleaning and descaling discharged?

☐ same discharge point as treated effluent ☐ sanitary sewer ☐ other (please describe)

3. **Anticipated operating schedule** during the new permit term (2020)

May 2020 mixing to require an estimated two weeks

4. **Anticipated flowrate** (in gpm), and total volume of treated water to be discharged per month:
None

5. **Effluent discharge point location**:

None

6. Is an **air permit** from the DNR air management program required? If not, why not

No – subsurface addition – VOCs are chemically degraded in the subsurface with no emissions to air.

III. DISCHARGE MANAGEMENT PLAN UPDATE

Include the following information:

1. A **summary** of analytical results for contaminants **detected** at the site.

2. Results from the most recent **volatile organic compounds (VOC) scan**, including methods used and detection levels.

3. Results from an analysis of the **poly-nuclear aromatic hydrocarbons (PAHs)** shown on the right, including methods used and detection levels (unless PAH data are already submitted)

   The lab needs to reach the lowest detection level achievable for each parameter because of the low limit for total PAHs. EPA test method SW-846 8310 is recommended.

benzo(a)anthracene	dibenzo(a,h)anthracene
benzo(a)pyrene	fluoranthene
benzo(b)fluoranthene	indeno(1,2,3-cd)pyrene
benzo(g,h,i)perylene	naphthalene
benzo(k)fluoranthene	phenanthrene
chrysene	pyrene

4. **Contaminants proposed for periodic monitoring** and demonstration of why any monitoring required in the permit should be exempted due to low level of contaminants in the wastewater discharge.

5. **Information to support request for any alternate effluent limit** for discharges to groundwater (Part 5 of permit) or request for temporary exemption for in-situ discharges (Part 6 of permit).

6. **Plans and specifications for the proposed treatment system** identifying sampling points. For supplier furnished package treatment units, only a flow diagram, design summary, and unit sizing calculations are required.

7. **General description of operations**, identifying operational tasks, who is responsible to do that task, and how frequently the task is done (particularly needed at pump & treat systems).

8. A **site plan** that identifies general land uses, underground storage tanks and pipelines, groundwater monitoring and recovery wells, contaminant plume definition and zone of influence, other known spills in the area, septic tanks and drain fields, separation distances to potable water supply wells and residences, and other pertinent information.

9. A **detailed map** of the discharge location, showing if discharge is direct or via a storm sewer or other conveyance. Indicate distance from site to discharge location and other impacted water bodies or wetlands.
   - If a city storm sewer is used, approval from the municipality is required.

- If a new outfall structure is proposed, the plans should identify the outfall and incorporate appropriate erosion control methods. A permit for riprap projects (available at most DNR offices) should be obtained.
- Wetland discharges are not allowed unless they meet wetland protection requirements of Ch. NR 103, Wis. Admin. Code.

III. SIGNATURES

A. Signature of person completing the form, attesting to the accuracy and completeness of the statements made.

Matt [signature]	Branch Manager	4/15/2020
Name	Title	Date Signed
909 North 8th Street, Suite 101, Sheboygan, WI 53081	mdahlem@fehr-graham.com	920-453-0700
Address	Email	Telephone Number

B. This application must be signed by the official representative of the permitted facility (responsible party) who is: the owner, the sole proprietor for a sole proprietorship, a general partner for a partnership, or by a ranking elected official or other duly authorized representative for a unit of government, or an executive officer of at least the level of vice president for a corporation, having overall responsibility for the operation of the facility. If the application is not signed, or is found to be incomplete, it will be returned.

DAVID JERRETT	CHIEF OPERATING OFFICER
Typed or Printed Name of Official Representative	Title
[signature]	04/15/2020
Signature of Official Representative	Date Signed

Submit this General Permit Request for Coverage:

Department of Natural Resources,
Water Permits Central Intake - WT/3,
P.O. Box 7185,
Madison, WI 53707-7185.

The decision on whether to cover this discharge under the remediation general permit will be made by regional DNR wastewater staff. Upon receipt in Madison, this application will be forwarded to the appropriate regional staff person.

A copy of the submittal should also be sent to the Department Remediation & Redevelopment Project Manager.
Watershed Central:\General Permits\Reissue Docs\Grw Remediation\Request For Coverage 2012.doc

SAFETY DATA SHEET

Ferrous Sulfate Heptahydrate

SDS ID: MI0316 NAME: FERROUS SULFATE HEPTAHYDRATE W/ADDITIVE

Printed: 03/16/2015
Revision: 03/16/2015
Supersedes Revision: 11/19/2014

1. Product and Company Identification

Product Code: FSH

Product Name: Ferrous Sulfate Heptahydrate

Trade Name: copperas, green vitriol

Company Name: CROWN TECHNOLOGY, INC
7513 E. 96TH STREET
Indianapolis, IN 46256

Phone Number: (317)845-0045

Web site address: crowntech.com

Emergency Contact: PERS (800)633-8253

2. Hazards Identification

Acute Toxicity: Oral, Category 4
Skin Corrosion/Irritation, Category 2
Serious Eye Damage/Eye Irritation, Category 2

GHS Signal Word: **Warning**

GHS Hazard Phrases:
H302 - Harmful if swallowed.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.

GHS Precaution Phrases:
P264 - Wash hands thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P362+364 - Take off contaminated clothing and wash it before reuse.

GHS Response Phrases:
P301+312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330 - Rinse mouth.
P302+352 - IF ON SKIN: Wash with plenty of soap and water.
P332+313 - If skin irritation occurs, get medical advice/attention.
P305+351+338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+313 - If eye irritation persists, get medical advice/attention.

GHS Storage and Disposal Phrases: No phrases apply.

Potential Health Effects (Acute and Chronic):

3. Composition/Information on Ingredients

CAS #	Hazardous Components (Chemical Name)	Concentration
7782-63-0	Ferrous sulfate	100.0 %

4. First Aid Measures

Emergency and First Aid Procedures:

In Case of Inhalation: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention. Never give anything by mouth to an unconscious person.

In Case of Skin Contact: Wash skin with soap and water.

In Case of Eye Contact: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If eye irritation persists, get medical advice/attention.

In Case of Ingestion: If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

5. Fire Fighting Measures

Flash Pt: No data.

Explosive Limits: LEL: No data. UEL: No data.

Autoignition Pt: No data.

Suitable Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or alcohol-resistant foam.

Fire Fighting Instructions: Substance is noncombustible.

Flammable Properties and Hazards: No data available.

6. Accidental Release Measures

Steps To Be Taken In Case Material Is Released Or Spilled: Clean up spills immediately, observing precautions in Protective Equipment section.

7. Handling and Storage

Precautions To Be Taken in Handling: Store in a cool dry place.

Precautions To Be Taken in Storing: Keep container closed when not in use.

8. Exposure Controls/Personal Protection

CAS #	Partial Chemical Name	OSHA TWA	ACGIH TWA	Other Limits
7782-63-0	Ferrous sulfate	No data.	No data.	No data.

Respiratory Equipment (Specify Type): ANSI approved respirator.

Eye Protection: Goggles.

Protective Gloves: Wear appropriate protective gloves to prevent skin exposure.

Other Protective Clothing: Wear appropriate protective clothing to prevent skin exposure.

Engineering Controls (Ventilation etc.): No data available.

9. Physical and Chemical Properties

Physical States:	[ ] Gas [ ] Liquid [X] Solid
Appearance and Odor:	Appearance: Bluish Green Crystals. Odor: metal odor.
Melting Point:	149.00 F (65.0 C)
Boiling Point:	572.00 F (300.0 C)
Decomposition Temperature:	572.00 F (300.0 C)
Autoignition Pt:	No data.
Flash Pt:	No data.
Explosive Limits:	LEL: No data. UEL: No data.
Specific Gravity (Water = 1):	No data.
Density:	55 LB/CF
Vapor Pressure (vs. Air or mm Hg):	No data.
Vapor Density (vs. Air = 1):	No data.
Evaporation Rate:	No data.
Solubility in Water:	46.8g/100g
pH:	5% Sol 2.5 - 5
Percent Volatile:	No data.
Molecular Formula & Weight:	FeSO4*7H2O 278.0

10. Stability and Reactivity

Stability:	Unstable [ ] Stable [X]
Conditions To Avoid - Instability:	No data available.
Incompatibility - Materials To Avoid:	No data available.
Hazardous Decomposition Or Byproducts:	No data available.
Possibility of Hazardous Reactions:	Will occur [X] Will not occur [ ]
Conditions To Avoid - Hazardous Reactions:	No data available.

11. Toxicological Information

Toxicological Information: CAS# 7782-63-0: Acute toxicity, LD50, Oral, Mouse, 1520. MG/KG. Results: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Mydriasis (pupilliary dilation). Behavioral: Convulsions or effect on seizure threshold. Gastrointestinal:Nausea or vomiting. ; American Journal of the Medical Sciences., Slack Inc., 6900 Grove Rd., Thorofare, NJ 08086, Vol/p/yr: 230,491, 1955

Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

12. Ecological Information

General Ecological Information: No data available.

Results of PBT and vPvB assessment: No data available.

13. Disposal Considerations

Waste Disposal Method: Observe all federal, state, and local environmental regulations.

14. Transport Information

LAND TRANSPORT (US DOT):

DOT Proper Shipping Name: Not regulated as a hazardous material.
DOT Hazard Class:
UN/NA Number: NA9188

15. Regulatory Information

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

CAS #	Hazardous Components (Chemical Name)	S. 302 (EHS)	S. 304 RQ	S. 313 (TRI)
7782-63-0	Ferrous sulfate	No	Yes 1000 LB	No

This material meets the EPA 'Hazard Categories' defined for SARA Title III Sections 311/312 as indicated:

[X] Yes [ ] No Acute (immediate) Health Hazard
[ ] Yes [X] No Chronic (delayed) Health Hazard
[ ] Yes [X] No Fire Hazard
[ ] Yes [X] No Sudden Release of Pressure Hazard
[ ] Yes [X] No Reactive Hazard

16. Other Information

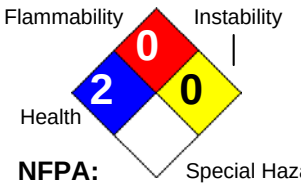
Revision Date: 03/16/2015

Hazard Rating System:

HMIS:

HEALTH	2
FLAMMABILITY	0
PHYSICAL	0
PPE	

NFPA:



Additional Information About This Product: No data available.

SAFETY DATA SHEET

HYDROGEN PEROXIDE 50% STANDARD GRADE
Product ID: MI081300
Revised: 01-31-2014
Replaces: 01-27-2014

1. IDENTIFICATION

Product Name:	HYDROGEN PEROXIDE 50% STANDARD GRADE
Synonyms:	Peroxide; Hydrogen Dioxide
CAS Number:	MIXTURE
Recommended Use:	No data available.
Restrictions on Use:	No data available.

Hydrite Chemical Co.
300 N. Patrick Blvd.
Brookfield, WI 53008-0948
(262) 792-1450

EMERGENCY RESPONSE NUMBERS:
24 Hour Emergency #: (414) 277-1311
CHEMTREC Emergency #: (800) 424-9300

2. HAZARD(S) IDENTIFICATION

Signal Word:	Danger
GHS Classification:	Skin Corrosion/Irritation Category 1B Serious Eye Damage/Eye Irritation Category 1 Oxidizing Liquid Category 2 Acute Toxicity - Inhalation Vapour Category 3 Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 3 Acute Toxicity - Inhalation Dust / Mist Category 4 Acute Toxicity - Oral Category 4
Hazard Statements:	May intensify fire; oxidizer. Harmful if swallowed or if inhaled. Causes severe skin burns and eye damage. Toxic if inhaled. May cause respiratory irritation. May cause drowsiness or dizziness.

Precautionary Statements:

Prevention:	Keep away from heat, sparks, open flames and hot surfaces. – No smoking. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Do not breathe dust, fume, gas, mist, vapours or spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear gloves, eye and face protection and protective clothing.
Response:	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.

	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician. Specific treatment (see First Aid on SDS or on this label). Wash contaminated clothing before reuse. In case of fire: Use appropriate extinguishing media - See Section 5 on SDS.
Storage:	Store in a well-ventilated place. Keep container tightly closed. Store in a secure manner.
Disposal:	Dispose of in accordance with local, regional and international regulations.

Hazards Not Otherwise Classified: None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	% by Wt.
Hydrogen Peroxide	7722-84-1	~ 50 %

4. FIRST-AID MEASURES

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open. Tilt head to avoid contaminating unaffected eye. Get immediate medical attention.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Do not reuse clothing and shoes until cleaned. Wash with soap and water. Discard shoes if contaminated.

Inhalation: Remove to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial respiration, preferably mouth-to-mouth. GET MEDICAL ATTENTION IMMEDIATELY. Keep warm and quiet.

Ingestion: If swallowed, call a physician immediately. DO NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Rinse mouth with fresh water. Give 1-2 glasses of water to drink. Keep warm and quiet.

Note to Physicians:
Exposure to material may cause delayed lung injury resulting in pulmonary edema and pneumonitis. Exposed individuals should be monitored for 72 hours after exposure for the onset of delayed respiratory symptoms. Hydrogen peroxide is a strong oxidant. Direct contact with the eye is likely to cause corneal damage, especially if not washed immediately. Careful ophthalmologic evaluation is recommended and the possibility of local corticosteroid therapy should be considered. Because of the likelihood of corrosive effects on the gastrointestinal tract after ingestion and the unlikelihood of systemic effects, attempts at evacuating the stomach via emesis induction or gastric lavage should be avoided. There is a remote possibility, however, that a nasogastric or orogastric tube may be required for the reduction of severe distension due to gas formation.

Most Important Symptoms/Effects:

Eye Contact: CORROSIVE-Causes severe irritation and burns. May cause: corneal damage. permanent eye damage. blindness. Effects may be delayed.

Skin Contact: CORROSIVE-Causes severe irritation and burns. Contact with concentrated liquid for a short period of time may cause a temporary whitening or bleaching of the skin.

Skin Absorption: Practically non-toxic if absorbed through the skin.

Inhalation: CORROSIVE-Causes severe irritation and burns. High concentrations of vapor or mist may cause severe irritation of the: nose. throat. respiratory tract. Excessive exposure may cause: pulmonary edema. death. Toxic by inhalation. Effects may be delayed.

Ingestion: CORROSIVE-Causes severe irritation and burns. Moderately toxic by ingestion. May cause: gastrointestinal irritation. nausea. vomiting. diarrhea. ulcerations. burns. edema (fluid in lungs). death. The rapid releasing of oxygen can cause distension and bleeding of the mucosa in the stomach and lead to severe damage of the intestinal organs, especially in the event of greater intake of the product.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Water only. Water spray. Water fog. Water (flood with water). DO NOT USE: Organic compounds.

Fire Fighting Methods: Evacuate area of unprotected personnel. Wear protective clothing including NIOSH-approved self-contained breathing apparatus. Remain upwind of fire to avoid hazardous vapors and decomposition products. Use water spray to cool fire-exposed containers. Move containers from fire area if possible without hazard. Run-off from fire control may cause pollution.

Fire and Explosion Hazards: STRONG OXIDIZER. Forms explosive mixtures with combustible, organic, or other easily oxidizable materials. These mixtures are easily ignited by friction or heat. Heated material can form flammable vapors with air. Heated material can form explosive vapors with air. Decomposition will release oxygen, which will intensify a fire. The rate of decomposition may exceed the vent capacity of storage containers and cause an explosion. Solutions above 65% are especially hazardous as they do not contain enough water to remove the heat of decomposition by evaporation.

Hazardous Combustion Products: Oxygen.

6. ACCIDENTAL RELEASE MEASURES

Spill Clean-Up Procedures: CORROSIVE MATERIAL. STRONG OXIDIZER. Eliminate all sources of ignition. Evacuate unprotected personnel from area. Maintain adequate ventilation. Follow personal protective equipment recommendations found in Section 8. Never exceed any occupational exposure limit. Shut off source of leak if safe to do so. Never return spilled product into its original container. Never put spilled material into another container for disposal. Avoid contact with organic or combustible material which may cause fire or violent decomposition. Dilute spill with large amounts of water to a concentration of 5% hydrogen peroxide; hold in a pond or diked area until peroxide is completely decomposed or dispose of according to all local, state and federal regulations. Hydrogen peroxide may be decomposed by adding sodium metabisulfite or sodium sulfite after diluting to 5%. Flush remaining area with water to remove trace residue and dispose of properly. Avoid direct discharge to sewers and surface waters. Notify authorities if entry occurs. Combustible materials exposed to hydrogen peroxide should be immediately submerged in or rinsed with large amounts of water to ensure that all hydrogen peroxide is removed. Residual hydrogen peroxide that is allowed to dry (upon evaporation hydrogen peroxide can concentrate) on organic materials such as paper, fabrics, cotton, leather, wood, or other combustibles, can cause the material to ignite and result in a fire.

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Do not swallow. Avoid breathing vapors, mists, or dust. Do not eat, drink, or smoke in work area. Wash thoroughly after handling. Empty containers retain product residue (vapor, dust, or liquid) and can be dangerous. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other source of ignition. They may explode and cause injury or death. Avoid contamination. Never return unused product to container. Contamination may cause decomposition and generation of oxygen gas which could result in high pressure and possibly container rupture. Use non-sparking tools and equipment. Utensils used for handling hydrogen peroxide should only be made of glass, stainless steel, aluminum or plastic.

Storage: CORROSIVE MATERIAL. STRONG OXIDIZER. Store in a cool, well ventilated area away from all sources of ignition and out of direct sunlight. Store in a dry location away from heat. Keep away from incompatible materials. Keep containers tightly closed. Do not store in unlabeled or mislabeled containers. Avoid storage on wood floors or near wooden walls, etc.. Do not store on wooden pallets. Store in a vented container. Do not store near combustible materials. DO NOT contaminate water, food or feed by storage or disposal. Refer

to the National Fire Protection Association (NFPA) Code for the Storage of Organic Peroxide Formulations. See Section 10 for incompatible materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OSHA Exposure Guidelines:

Component	Limits
Hydrogen Peroxide	1 ppm TWA; 1.4 mg/m3 TWA

ACGIH Exposure Guidelines:

Component	Limits
Hydrogen Peroxide	1 ppm TWA

Engineering Controls: General room ventilation is required. Local exhaust ventilation, process enclosures or other engineering controls may be needed to maintain airborne levels below recommended exposure limits. Maintain adequate ventilation. Do not use in closed or confined spaces. Avoid creating dust or mist. Keep levels below exposure limits. To determine exposure levels, monitoring should be performed regularly.

Eye/Face Protection: Wear chemical safety goggles and a full face shield while handling this product.

Skin Protection: Prevent contact with this product. Wear gloves and protective clothing depending on condition of use. Protective gloves: Butyl rubber. Neoprene. Polyvinyl chloride. Nitrile. Inspect regularly for leaks. Thoroughly rinse the outside of gloves with water prior to removal. Avoid cotton, wool and leather clothing and shoes.

Respiratory Protection: Respiratory protection must be worn if ventilation does not eliminate symptoms or keep levels below recommended exposure limits. If exposure limits are exceeded, wear: NIOSH-Approved respirator. NIOSH-Approved self-contained breathing apparatus. DO NOT use any form of air-purifying respirator (APR) or filtering facepiece (AKA dust mask), especially those containing oxidizable sorbants such as activated carbon. DO NOT exceed limits established by the respirator manufacturer. All respiratory protection programs must comply with OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements and must be followed whenever workplace conditions require a respirator's use.

Other Protective Equipment: Eye-wash station. Safety shower. Rubber apron. Rubber boots. Impervious clothing. Full body suit. NOTE: As the water content of hydrogen peroxide evaporates, cotton, rayon, and wool fibers are particularly subject to spontaneous combustion. Where there is significant risk of sudden splash or spray, it is advised that an apron or rubber suit be worn. Any contaminated clothing, including gloves, shoes, aprons, coveralls, etc., should be removed immediately and throroughly flushed with water to eliminate any traces of hydrogen peroxide before cleaning and reuse. Residual hydrogen peroxide, if allowed to dry on material such as paper, fabrics, cotton, leather, wood or other combustibles can cause the material to ignite and result in fire.

General Hygiene Conditions: Wash with soap and water before meal times and at the end of each work shift. Good manufacturing practices require gross amounts of any chemical be removed from skin as soon as practical, especially before eating or smoking. Food, beverages, and tobacco products should not be carried, stored or consumed where this material is in use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid.
Color: Clear. Colorless.
Odor: No odor.
Odor Threshold: N.D.
pH: <= 3.00 (as is)
Freezing Point (deg. F): 1.4 - -68.8
Melting Point (deg. F): N.D.
Initial Boiling Point or Boiling Range: 237 °F
Flash Point: N.A.
Flash Point Method: N.A.
Evaporation Rate (nBuAc = 1): > 1

Flammability (solid, gas): N.D.
Lower Explosion Limit: N.A.
Upper Explosion Limit: N.A.
Vapor Pressure (mm Hg): 18.3 @ 30C
Vapor Density (air=1): N.D.
Specific Gravity or Relative Density: 1.19 @ 20 C
Solubility in Water: Complete
Partition Coefficient (n-octanol/water): N.D.
Autoignition Temperature: N.A.
Decomposition Temperature: N.D.
Viscosity: N.D.
% Volatile (wt%): 100
VOC (wt%): 0
VOC (lbs/gal): 0
Fire Point: N.D.

10. STABILITY AND REACTIVITY

Reactivity: No data available.

Chemical Stability: Stable under normal conditions.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur under normal conditions. Contact with organic materials may cause fire and explosions. Contact with metals, metallic ions, alkalis, reducing agents and organic matter (such as alcohols or terpenes) may produce self-accelerated thermal decomposition.

Conditions to Avoid: Avoid elevated temperatures. Avoid exposure to light. UV-rays. pH variations. Excessive heat or contamination could cause product to become unstable.

Incompatible Materials: Oxygen. Reducing agents. Alkalies. Combustible materials. Organics. Wood. Dust. Paper. Dirt. Decomposition catalysts. Metals. Metal salts. Metal ions. Copper or copper alloys. Galvanized iron. Metal Oxides. Acids. Salts.

Hazardous Decomposition Products: Oxygen. Material decomposes with the potential to produce a rupture of unvented closed containers. This material decomposes if contaminated, causing fire and possible explosions. Oxygen can be liberated at temperatures above ambient.

11. TOXICOLOGICAL INFORMATION

Component	Oral LD50	Dermal LD50	Inhalation LC50
Hydrogen Peroxide	Rat: 801 mg/kg	Rabbit: 2000 mg/kg	4H Rat: 2.0 g/m3

Acute Toxicity Estimate (ATE):

Oral:	1,602 mg/kg
Dermal:	4,000 mg/kg
Inhalation Vapor:	4.0000 mg/L
Inhalation Dust/Mist:	4.0000 mg/L

Routes of Exposure: Eyes. Skin. Inhalation. Ingestion.

Eye Contact: CORROSIVE-Causes severe irritation and burns. May cause: corneal damage. permanent eye damage. blindness. Effects may be delayed.

Skin Contact: CORROSIVE-Causes severe irritation and burns. Contact with concentrated liquid for a short period of time may cause a temporary whitening or bleaching of the skin.

Skin Absorption: Practically non-toxic if absorbed through the skin.

Inhalation: CORROSIVE-Causes severe irritation and burns. High concentrations of vapor or mist may cause severe irritation of the: nose. throat. respiratory tract. Excessive exposure may cause: pulmonary edema. death. Toxic by inhalation. Effects may be delayed.

Ingestion: CORROSIVE-Causes severe irritation and burns. Moderately toxic by ingestion. May cause: gastrointestinal irritation. nausea. vomiting. diarrhea. ulcerations. burns. edema (fluid in lungs). death. The rapid releasing of oxygen can cause distension and bleeding of the mucosa in the stomach and lead to severe damage of the intestinal organs, especially in the event of greater intake of the product.

Medical Conditions Aggravated by Exposure to Product: Lung disorders. Eye disorders.

Other: None known.

Cancer Information:
This product does not contain 0.1% or more of the known or potential carcinogens listed in NTP, IARC, or OSHA.

12. ECOLOGICAL INFORMATION

Ecotoxicological Information: Hydrogen Peroxide:
Slightly toxic. Fish 96 h LC50 between 10-37 mg/l
Moderately toxic. Daphnia magna (Water flea) EC50 = 7.7 mg/L
Moderately toxic. Daphnia pulex (Water flea) EC50 = 2.4 mg/L
Slightly toxic. Bacteria EC50 = 30 mg/L
Highly toxic. Algae EC50 = 0.85 mg/L

Chemical Fate Information: Hydrogen peroxide in the aquatic environment is subject to various reduction or oxidation processes and decomposes into water and oxygen. Hydrogen peroxide half-life in freshwater ranged from 8 hours to 20 days, in air from 10-20 hours and in soils from minutes to hours depending upon microbiological activity and metal contaminants.

Material may have some potential to bioaccumulate but will likely degrade in most environments before accumulation can occur.

Will likely be in environment due to its water solubility but will likely degreade over time.

13. DISPOSAL CONSIDERATIONS

Hazardous Waste Number: D001, D002
Disposal Method: Dispose of in a permitted hazardous waste management facility following all local, state and federal regulations. Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations. Since emptied containers retain product residue, follow label warnings even after container is emptied. DO NOT pressurize, cut, weld, solder, drill, grind or expose empty containers to heat, flame, sparks or other sources of ignition. Empty containers should be triple rinsed with water before discarding.

14. TRANSPORT INFORMATION

DOT (Department of Transportation):

Identification Number:	UN2014
Proper Shipping Name:	HYDROGEN PEROXIDE, AQUEOUS SOLUTION
Hazard Class:	5.1 (8)
Packing Group:	II
Label Required:	OXIDIZER; CORROSIVE

15. REGULATORY INFORMATION

TSCA Inventory Status: This product or all components of this product are listed on the EPA/TSCA Inventory of Chemical Substances.

SARA Title III Section 311/312 Category Hazards:

Immediate (Acute)	Delayed (Chronic)	Fire Hazard	Pressure Release	Reactive
Yes	No	Yes	No	No

Regulated Components: Component	CAS Number	CERCLA RQ	SARA EHS	SARA 313	U.S. HAP	WI HAP	Prop 65
Hydrogen Peroxide	7722-84-1	No	Yes	No	No	Yes	No

Note: * SARA RQ and TPQ are for Hydrogen Peroxide (Conc.> 52%).

16. OTHER INFORMATION

Hazard Rating System
Health: 3
Flammability: 0
Reactivity: 1
* = Chronic Health Hazard

NFPA Rating System
Health: 3
Flammability: 0
Reactivity: 1
Special Hazard: OX

MSDS Abbreviations
N.A. = Not Applicable
N.D. = Not Determined
HAP = Hazardous Air Pollutant
VOC = Volatile Organic Compound
C = Ceiling Limit
N.E./Not Estab. = Not Established

MSDS Prepared by: JB

Reason for Revision: New format. Changes made throughout the MSDS.

Revised: 01-31-2014
Replaces: 01-27-2014

The data in this Material Safety Data Sheet relates to the specific material designated and does not relate to its use in combination with any other material or process. The data contained is believed to be correct. However, since conditions of use are outside our control it should not be taken as warranty or representation for which HYDRITE CHEMICAL CO. assumes legal responsibility. This information is provided solely for your consideration, investigation, and verification.

SAFETY DATA SHEET

SULFURIC ACID 66 DEG.
Product ID: AC006600
Revised: 02-14-2014
Replaces: 10-12-2009

1. IDENTIFICATION

Product Name:	SULFURIC ACID 66 DEG.
Synonyms:	Sulfuric acid; Oil of vitriol; Hydrogen sulfate
CAS Number:	MIXTURE
Recommended Use:	No data available.
Restrictions on Use:	No data available.

Hydrite Chemical Co.
300 N. Patrick Blvd.
Brookfield, WI 53008-0948
(262) 792-1450

EMERGENCY RESPONSE NUMBERS:
24 Hour Emergency #: (414) 277-1311
CHEMTREC Emergency #: (800) 424-9300

2. HAZARD(S) IDENTIFICATION

Signal Word:	Danger
GHS Classification:	Substance or mixture corrosive to metals Category 1 Skin Corrosion/Irritation Category 1A Serious Eye Damage/Eye Irritation Category 1 Carcinogenicity Category 1A Acute Toxicity - Inhalation Vapour Category 2 Specific Target Organ Systemic Toxicity (STOT) - Repeated Exposure Category 2 Acute Toxicity - Inhalation Dust / Mist Category 3
Hazard Statements:	May be corrosive to metals. Causes severe skin burns and eye damage. Fatal if inhaled. Toxic if inhaled. May cause cancer. May cause damage to organs (teeth, respiratory system) through prolonged or repeated exposure (by inhalation).

Precautionary Statements:

Prevention:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep only in original container. Do not breathe dust, fume, gas, mist, vapours or spray. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear gloves, eye and face protection and protective clothing. Wear respiratory protection.
Response:	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or doctor/physician.
Specific treatment is urgent (see First Aid on SDS or on this label).
Wash contaminated clothing before reuse.
Absorb spillage to prevent material damage.

Storage: Store in a well-ventilated place. Keep container tightly closed.
Store in a secure manner.
Store in corrosive resistant container with a resistant inner liner.

Disposal: Dispose of in accordance with local, regional and international regulations.

Hazards Not Otherwise Classified: None known.

Percentage of Components with Unknown Acute Toxicity:
Dermal: 93.2 %

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	% by Wt.
Sulfuric Acid	7664-93-9	93.19 %

4. FIRST-AID MEASURES

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open. Tilt head to avoid contaminating unaffected eye. Get immediate medical attention.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Do not reuse clothing and shoes until cleaned. Discard contaminated leather articles such as shoes and belt. Do not apply oils or ointments unless ordered by the physician.

Inhalation: Remove to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial respiration, preferably mouth-to-mouth. GET MEDICAL ATTENTION IMMEDIATELY.

Ingestion: If fully conscious, drink a quart of water. DO NOT induce vomiting. CALL A PHYSICIAN IMMEDIATELY. If unconscious or in convulsions, take immediately to a hospital or a physician. NEVER induce vomiting or give anything by mouth to an unconscious victim. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.

Note to Physicians:
This product contains materials that may cause severe pneumonitis if aspirated. If ingestion has occurred less than 2 hours earlier, carry out careful gastric lavage; use endotracheal cuff if available, to prevent aspiration. Observe patient for respiratory difficulty from aspiration pneumonitis. Give artifical resuscitation and appropriate chemotherapy if respiration is depressed. Following exposure the patient should be kept under medical review for at least 48 hours as delayed pneumonitis may occur. DO NOT attempt to neutralize the acid with weak bases since the reaction will produce heat that may extend the corrosive injury.

Most Important Symptoms/Effects:

Eye Contact: CORROSIVE-Causes severe irritation and burns. May cause: blurred vision. redness. pain. conjunctivitis. ulcerations. tissue destruction. permanent eye damage. blindness.

Skin Contact: CORROSIVE-Causes severe irritation and burns. Concentrated solutions may cause: severe burns. severe necrosis. permanent skin damage. Prolonged and repeated exposure to dilute solutions may cause irritation, redness, pain and drying and cracking of the skin.

Skin Absorption: No data available.

Inhalation: CORROSIVE-Causes severe irritation and burns. Vapors or mists may damage: mucous membranes. respiratory tract. Vapors or mists may cause: coughing. sore throat. shortness of breath. labored breathing. choking. bronchospasms. chemical pneumonitis. pulmonary edema. death. Effects may be delayed. Chronic exposure may cause: dental erosions. discoloration of teeth. bronchitis. bronchial emphysema.

Ingestion: CORROSIVE-Causes severe irritation and burns. May cause damage to the: mouth. throat. esophagus. stomach. gastrointestinal tract. May cause: pain. vomiting. diarrhea. bleeding. labored breathing. burns or perforation of the gastrointestinal tract leading to ulceration and secondary infection. death. Effects may be delayed. Aspiration into the lungs may cause chemical pneumonia and lung damage.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Carbon dioxide. Dry chemical. Foam.

Fire Fighting Methods: Evacuate area of unprotected personnel. Wear protective clothing including NIOSH-approved self-contained breathing apparatus. Remain upwind of fire to avoid hazardous vapors and decomposition products. Use water spray to cool fire-exposed containers. Do not get water inside containers. Product generates heat upon addition of water, with possible spattering. Neutralize run-off with Lime, Soda Ash, etc., to prevent corrosion of metals and formation of Hydrogen gas. Run-off from fire control may cause pollution.

Fire and Explosion Hazards: Product may react with some metals (ex.: Aluminum, Zinc, Tin, etc.) to release flammable hydrogen gas. Will react with organic materials with evolution of heat and sulfur dioxide. Concentrated acid is a strong oxidizing agent. May cause ignition of combustible materials on contact with generation of sulfur dioxide fumes.

Hazardous Combustion Products: Sulfur oxides.

6. ACCIDENTAL RELEASE MEASURES

Spill Clean-Up Procedures: CORROSIVE MATERIAL. Evacuate unprotected personnel from area. Maintain adequate ventilation. Follow personal protective equipment recommendations found in Section 8. Never exceed any occupational exposure limit. Contain spill, place into drums for proper disposal. Flush remaining area with water and neutralize with Soda Ash or Lime and dispose of properly. Avoid direct discharge to sewers and surface waters. Notify authorities if entry occurs.

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Do not swallow. Avoid breathing vapors, mists, or dust. Do not eat, drink, or smoke in work area. Wash thoroughly after handling. Empty containers retain product residue (vapor, dust, or liquid) and can be dangerous. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other source of ignition. They may explode and cause injury or death. Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools.

Storage: CORROSIVE MATERIAL. Store in a cool, well ventilated area, out of direct sunlight. Store in a dry location away from heat. Keep away from incompatible materials. Keep containers tightly closed. Do not store in unlabeled or mislabeled containers. Do not freeze. Highly corrosive to most metals with evolution of hydrogen gas. Explosive/flammable concentrations of hydrogen gas may accumulate inside metal containers. Elevated temperatures will increase the corrosion rate of most metals. See Section 10 for incompatible materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OSHA Exposure Guidelines:

Component	Limits
Sulfuric Acid	1 mg/m3 TWA

ACGIH Exposure Guidelines:

Component	Limits

Sulfuric Acid	0.2 mg/m3 TWA (thoracic fraction)

Engineering Controls: Local exhaust ventilation, process enclosures, or other engineering controls are required when handling or using this product to avoid overexposure. Maintain adequate ventilation. Do not use in closed or confined spaces. Avoid creating dust or mist. Keep levels below exposure limits. To determine exposure levels, monitoring should be performed regularly.

Eye/Face Protection: Wear chemical safety goggles and a full face shield while handling this product. Do not wear contact lenses.

Skin Protection: Prevent contact with this product. Wear gloves and protective clothing depending on condition of use. Protective gloves: Acid-proof. Chemical-resistant. Impervious.

Respiratory Protection: Respiratory protection must be worn if ventilation does not eliminate symptoms or keep levels below recommended exposure limits. If exposure limits are exceeded, wear: NIOSH-Approved air-purifying respirator with: Acid gas cartridge and Dust/mist filter. NIOSH-Approved positive pressure supplied air respirator. NIOSH-Approved self-contained breathing apparatus. DO NOT exceed limits established by the respirator manufacturer. All respiratory protection programs must comply with OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements and must be followed whenever workplace conditions require a respirator's use.

Other Protective Equipment: Eye-wash station. Safety shower. Rubber apron. Chemical safety shoes. Rubber boots. Protective clothing. Full-rubber acid suit.

General Hygiene Conditions: Wash with soap and water before meal times and at the end of each work shift. Food, beverages, and tobacco products should not be carried, stored or consumed where this material is in use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Oily liquid.
Color: Clear to cloudy. Colorless to amber.
Odor: Odorless to pungent.
Odor Threshold: N.D.
pH: < 1.00
Freezing Point (deg. F): ~ -21
Melting Point (deg. F): N.A.
Initial Boiling Point or Boiling Range: ~ 529 °F
Flash Point: N.A.
Flash Point Method: N.A.
Evaporation Rate (nBuAc = 1): <1
Flammability (solid, gas): N.D.
Lower Explosion Limit: N.A.
Upper Explosion Limit: N.A.
Vapor Pressure (mm Hg): 0.0016 @102F
Vapor Density (air=1): 3.4 (H_2SO_4)
Specific Gravity or Relative Density: 1.835 @25C
Solubility in Water: Complete
Partition Coefficient (n-octanol/water): N.D.
Autoignition Temperature: No Data
Decomposition Temperature: N.D.
Viscosity: N.D.
% Volatile (wt%): N.D.
VOC (wt%): 0
VOC (lbs/gal): 0
Fire Point: N.D.

10. STABILITY AND REACTIVITY

Reactivity: No data available.

Chemical Stability: Stable under normal conditions.

Possibility of Hazardous Reactions: Hazardous polymerization will not occur under normal conditions. May react with certain metals to produce flammable hydrogen gas. Hazardous gases are evolved on contact with chemicals such as cyanides, sulfides, carbides, etc.

Conditions to Avoid: Avoid contact with heat, sparks, electric arcs, other hot surfaces, and open flames. Contact with organic materials may cause fire and explosions. Contact with water may cause violent reaction with evolution of heat. To dilute: Add product slowly to lukewarm water; not water to product.

Incompatible Materials: Metals. Water. Alkalies. Strong oxidizing agents. Reducing agents. Carbonates. Cyanides. Sulfides. Carbides. Chlorates. Fulminates. Nitrates. Powdered metals. Organic materials. Combustible materials. Nitrogen compounds. Picrates. Bases. Halogens. Alkali metals. and many other reactive substances.

Hazardous Decomposition Products: Sulfur oxides. Sulfuric acid vapors. Hydrogen gas.

11. TOXICOLOGICAL INFORMATION

Component	Oral LD50	Dermal LD50	Inhalation LC50
Sulfuric Acid	Rat: 2140 mg/kg	No Data	2H Rat: 510.0 mg/m3

Acute Toxicity Estimate (ATE):

Inhalation Vapor: 0.5473 mg/L
Inhalation Dust/Mist: 0.5473 mg/L

Routes of Exposure: Eyes. Ingestion. Inhalation. Skin.

Eye Contact: CORROSIVE-Causes severe irritation and burns. May cause: blurred vision. redness. pain. conjunctivitis. ulcerations. tissue destruction. permanent eye damage. blindness.

Skin Contact: CORROSIVE-Causes severe irritation and burns. Concentrated solutions may cause: severe burns. severe necrosis. permanent skin damage. Prolonged and repeated exposure to dilute solutions may cause irritation, redness, pain and drying and cracking of the skin.

Skin Absorption: No data available.

Inhalation: CORROSIVE-Causes severe irritation and burns. Vapors or mists may damage: mucous membranes. respiratory tract. Vapors or mists may cause: coughing. sore throat. shortness of breath. labored breathing. choking. bronchospasms. chemical pneumonitis. pulmonary edema. death. Effects may be delayed. Chronic exposure may cause: dental erosions. discoloration of teeth. bronchitis. bronchial emphysema.

Ingestion: CORROSIVE-Causes severe irritation and burns. May cause damage to the: mouth. throat. esophagus. stomach. gastrointestinal tract. May cause: pain. vomiting. diarrhea. bleeding. labored breathing. burns or perforation of the gastrointestinal tract leading to ulceration and secondary infection. death. Effects may be delayed. Aspiration into the lungs may cause chemical pneumonia and lung damage.

Medical Conditions Aggravated by Exposure to Product: Eye disorders. Skin disorders. Respiratory system disorders.

Other: Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow skin contact or ingestion. Circulatory shock is often the immediate cause of death. The International Agency for Research on Cancer (IARC) has concluded that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to man, causing cancer of the larynx (the voice box). Although no direct link has been established between exposure to sulfuric acid itself, and cancer in man, exposure to any mist or aerosol during the use of this product should be avoided.

Cancer Information:
This product contains 0.1% or more of the following chemicals listed by NTP, IARC or OSHA as known or possible carcinogens:
Sulfuric acid mist

12. ECOLOGICAL INFORMATION

Ecotoxicological Information: No data available.

Chemical Fate Information: No data available.

13. DISPOSAL CONSIDERATIONS

Hazardous Waste Number: D002
Disposal Method: Dispose of in a permitted hazardous waste management facility following all local, state and federal regulations. Since emptied containers retain product residue, follow label warnings even after container is emptied. DO NOT pressurize, cut, weld, solder, drill, grind or expose empty containers to heat, flame, sparks or other sources of ignition.

14. TRANSPORT INFORMATION

DOT (Department of Transportation):

Identification Number:	UN1830
Proper Shipping Name:	SULFURIC ACID
Hazard Class:	8
Packing Group:	II
Label Required:	CORROSIVE
Reportable Quantity (RQ):	1000# (Sulfuric Acid)

15. REGULATORY INFORMATION

TSCA Inventory Status: All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

SARA Title III Section 311/312 Category Hazards:

Immediate (Acute)	Delayed (Chronic)	Fire Hazard	Pressure Release	Reactive
Yes	Yes	No	No	Yes

Regulated Components: Component	CAS Number	CERCLA RQ	SARA EHS	SARA 313	U.S. HAP	WI HAP	Prop 65
Sulfuric Acid	7664-93-9	Yes	Yes	Yes	No	Yes	Yes

Note: * Sulfuric acid appears on the Section 313 List. However, the listing only applies to the aerosol forms of sulfuric acid.

16. OTHER INFORMATION

Hazard Rating System
Health: 3*
Flammability: 0
Reactivity: 2
* = Chronic Health Hazard

NFPA Rating System
Health: 3
Flammability: 0
Reactivity: 2
Special Hazard: W

MSDS Abbreviations
N.A. = Not Applicable
N.D. = Not Determined
HAP = Hazardous Air Pollutant
VOC = Volatile Organic Compound
C = Ceiling Limit
N.E./Not Estab. = Not Established

MSDS Prepared by: CSH

Reason for Revision: New format. Changes made throughout the MSDS.

Revised: 02-14-2014
Replaces: 10-12-2009

The data in this Material Safety Data Sheet relates to the specific material designated and does not relate to its use in combination with any other material or process. The data contained is believed to be correct. However, since conditions of use are outside our control it should not be taken as warranty or representation for which HYDRITE CHEMICAL CO. assumes legal responsibility. This information is provided solely for your consideration, investigation, and verification.

SDS Safety Data Sheet

Section I Chemical Product and Company Identification

Product Name	BAM
Synonyms	BAM-X
CAS Number	7440-44-0
Active Ingredients	Pyrolyzed Cellulosic Material
Recommended Use	Soil Stabilization, Remedial Activities
Restrictions on Use	None
Formulated by	ORIN Technologies, LLC
Address	405 Investment Court, Verona, WI 53593 USA
Emergency Phone Number	**8 AM-5PM CST**: 608-838-6699 **5 PM -8 AM CST, Weekends, Holidays**: 262-821-7024

Section II Hazard(s) Identification

Signal Word	Warning
Hazard Statements	May cause Respiratory Irritation May form combustible dust concentrations in air
Precautionary Statements - Prevention	Do not breathe dust, fume, gas Wash thoroughly after handling Use only outdoors or in a well-ventilated area Wear gloves, eye, respiratory protection, face protection, and protective clothing
Precautionary Statement – Response	IF ON SKIN – Wash with plenty of soap and water IF INHALED – Remove victim to fresh air and keep at rest position comfortable for breathing. IF IN EYES –Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue Rinsing Call a POISON CENTER or doctor if you feel unwell If skin irritation occurs: Get medical advice or attention. If eye irritation persists: Get medical advice or attention. If respiratory irritation persists: Get medical advice or attention. Take off contaminated clothing and wash before reuse.
Storage	Store in a well ventilated place. Keep container tightly closed. Store in a secure manner.

Exposure Limits	**Synergistic Products**	**Sensitization/Irritancy:**	**Carcinogenicity/Teratogenicity/ Mutagenicity/Reproductive Effects:**
ND	ND	ND	None Known

Section III Composition and Information on Ingredients

Chemical Name	CAS#	wt/wt %
Carbon (Wood Derived)	7440-44-00	85-95 (dry basis)
Minerals (Wood Derived)	N/A	5-10 (dry basis)
Water	7780-20-0	10-30%

Hazardous Ingredients: NONE

Section IV First Aid Measures

Skin	Prolonged contact with skin may result in slight irritation/redness in sensitive individuals. Seek medical attention if persists. Wash with soap and water. Not expected to be harmful under normal conditions of use.
Eyes	May irritate the eyes and cause watering and redness in sensitive individuals. Rinse thoroughly with plenty of water to remove foreign bodies. Seek medical attention if persists.
Inhalation	Inhalation of dust may irritate nose, throat, and lungs. May aggravate pre-existing conditions. Remove affected person to fresh air. Seek medical attention if persists.
Ingestion	If suffering gastrointestinal discomfort, treat symptomatically. Do not ingest.

Section V Fire-Fighting Measures

Flammability	This product should not come into contact with naked flames.
Means of Extinguishing	Foam, Water Spray, CO_2 , Dry Chemical,
Advice for Fire Fighters	Wear self-contained breathing apparatus for firefighting if necessary

Flashpoint	NA	**Auto-Ignition Temperature**	ND
UEL	NA	**TDG Flammability Class**	ND
LEL	NA	**Hazardous Combustion Products**	NA

Section VI Accidental Release Measures

Personal Precautions, Protective Equipment, Emergency Procedures	Avoid dust formation. Avoid breathing vapors, mist, or gas. For personal protection, see Section 8
Environmental Precautions	No specific environmental precautions required.
Methods and materials for Containment and Cleanup	Sweep up and shovel. Keep in suitable, closed containers for disposal.
Reference for other sections	For disposal, see section 13.

Section VII Handling and Storage

Engineering Controls	Ventilate
Leak or Spill Procedure	Sweep up into suitable container. Prevent entry into waterways.
Handling Procedures and Equipment	Avoid direct and prolonged contact with skin
Storage Requirements	Store in a cool, well ventilated, dry place

Section VIII Exposure Controls/Personal Protection

Personal Protective Equipment	Respiratory:	Proper dust masks should be worn if prolonged use of this product is expected. Use type N95 dust masks for nuisance levels. Use respirators and components tested and approved under appropriate government standards (NIOSH).
	Eyes:	Use of safety glasses recommended to avoid contact with eyes (NIOSH).
	Gloves:	Use of gloves recommended to avoid direct skin contact.

Section IX Physical and Chemical Properties

Physical State	Solid
Odor and Appearance	Slightly earthy odor. Brown or black solid particles

Odor Threshold	NDA	Specific Gravity	1.5-2.1 for solid matrix, bulk density varies.	Evaporation Rate	NDA
Vapor Pressure	NDA	Vapor Density	NDA	Density	Varies
Boiling Point	NA	Freezing Point	NDA	pH	7-9.5
Flammability (solid, gas)	May form combustible dust concentrations in air	Explosive Properties Bar m/s	$K_{st=}$ 32 +/- 30%	Dust Explosion Class	St 1
Water Solubility	Not soluble	Auto Ignition Temp.	NDA	Relative Density	NDA
Partition Coefficient	NDA	Decomposition Temp.	NDA	Viscosity	NDA

Section X Stability and Reactivity

Chemical Stability:	Stable	Incompatibility:	Strong acids, alkalis, and oxidizing agents.
Conditions of Reactivity:	NA	Hazardous Decomposition Products:	Strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc. may result in rapid combustion. Avoid contact with strong acids.

Section XI Toxicological Information

No Data Available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Section XII Ecological Information

No Data Available

Section XIII Disposal Considerations

Disposal	Sweep, vacuum or shovel material into labeled container. If at all possible, reuse product. Keep out of any bodies of water.

Section XIV Transport Information

Shipping Information	Not regulated (DOT)

The information and recommendations set forth herein are presented in good faith and believed to be correct as of the date hereof. The information and recommendations are supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will ORIN Technologies, LLC. or any of its agents be responsible for damages of any nature whatsoever resulting from the use of or reliance upon the information and recommendations. No representations or warranties, either expressed or implied, of merchantability, fitness, or a particular purpose or of any other nature are made here under with respect to information or the product to which information refers.

Preparation Date:	July, 2018 MAB
Reason for Revision:	Updated Field Values