SENSIBLE SOLUTIONS

CES INC

REMEDIATION AND SHORELINE STABILIZATION PLAN
VOLUNTARY RESPONSE ACTION PROGRAM
34 KIDDER POINT ROAD
SEARSPORT, MAINE

Property Owner: GENERAL ALUM NEW ENGLAND CORP.
34 Kidder Point Road
Searsport, ME 04974

Prepared for: GAC CHEMICAL
34 Kidder Point Road
Searsport, ME 04974

Prepared by: CES, INC.
465 South Main Street
Brewer, Maine 04412

NOVEMBER 2014
JN: 10060.007

Report Prepared By:
CES, Inc.
PO Box 639
465 South Main Street
Brewer, Maine 04412
207.989.4824

Corporate Office
465 South Main Street
PO Box 639
Brewer, Maine 04412
207.989.4824

www.ces-maine.com

Engineers • Environmental Scientists • Surveyors

REMEDIATION AND SHORELINE STABILIZATION PLAN
VOLUNTARY RESPONSE ACTION PROGRAM

FOR

GAC CHEMICAL
34 KIDDER POINT ROAD
SEARSPORT, MAINE

Prepared by: **CES, INC.**
465 South Main Street
Brewer, Maine 04412

Denis St. Peter, PE

Andrea Dickinson, EI

Tim Brochu, PLS, CE&SC

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REMEDIATION AND SHORELINE STABILIZATION PLAN
VOLUNTARY RESPONSE ACTION PLAN
GAC CHEMICAL

SECTION 1 | INTRODUCTION

This report summarizes the investigations completed by CES, Inc. (CES) for the property located at 34 Kidder Point Road in Searsport, Maine and identified by the Town of Searsport Tax Assessor's Office as Lots 82 and 83 of Tax Map 7 (the Site). These recent investigations were completed along the intertidal area and within an area of interest (Lot 83) as described below by CES for, and at the request of, GAC Chemical in support of their Voluntary Response Action Program (VRAP) application submitted to the Maine Department of Environmental Protection (MDEP) on August 27, 2014. This plan describes the proposed remediation and shoreline stabilization to address the low pH conditions outlined in the *Investigations Summary Report* (CES, 2014). A separate *Public Communications Plan* (CES, 2014) has been prepared to address the MDEP VRAP Public Communications Decision Matrix (MDEP, effective January 1, 2008).

SECTION 2 | SITE BACKGROUND

2.1 Site Location and Legal Description

The Site is located at 34 Kidder Point Road, Searsport, Maine as shown on **Figure 1.** The Town of Searsport Tax Assessor's Map 7 identifies the Site as Lots 82 and 83 which consist of approximately 152 acres of land. The investigations summarized in this report were completed along the intertidal area and within an area of interest on Lot 83 of Tax Map 7. Refer to **Figure 2** for a Site Plan including a portion of the tax map showing the Site. The Waldo County Registry of Deeds has a legal description of the Site recorded on Page 294 of Book 1440.

2.2 Physical Setting

The U.S.G.S. 7.5 minute Quadrangle Map of Searsport, Maine shows that the Site is located to the east of Route 3 and is at an elevation between 0-120 feet above sea level. Lot 83 of the Site is bounded to the west by the Bangor and Aroostook Railroad and to the north, east, and south by tidal flats and Stockton Harbor.

2.3 Site Development

The Site is currently developed as a chemical manufacturing facility that produces a variety of chemicals such as: ammonium sulfate, liquid alum, aqua ammonia; and distributes sulfuric acid, specialty flocculants and coagulants, and customized chemical blends. The majority of the activities associated with the current use of the Site are conducted on Lot 82 of Tax Map 7.

Based on a review of municipal, regulatory, and historical records, the Site has been developed for commercial and/or industrial purposes since the early 1920s. Historical manufacturing activities were conducted on both Lot 82 and Lot 83 of Tax Map 7. The investigations summarized in this report were completed on Lot 83 of Tax Map 7. Historical activities on Lot 83 include a sulfuric acid manufacturing plant that ceased operations in 1989, a sulfur storage area, a fertilizer manufacturing facility, a superphosphate plant, storage buildings, and a maintenance garage.

Structures remaining on Lot 83 include the historical sulfuric acid plant, a maintenance garage, and a wastewater treatment plant. Underground structures include catch basins and storm drains that direct stormwater runoff from portions of Lot 82 and portions of Lot 83 into the wastewater treatment plant located on the eastern portion of Lot 83. Here the combined wastewater and stormwater are treated before being discharged to Stockton Harbor. The discharge from the wastewater treatment plant is managed in accordance with the site's Waste Discharge License (WDL) issued by MDEP.

2.4 Previous Investigations

Numerous investigations identifying soil, surface water, and groundwater contamination at the Site have been conducted since the 1980s and prior to GAC Chemical acquiring the Site in 1994. Reports describing the results of these investigations were provided to the MDEP previously. Based on the findings of the historical investigations at the Site, contaminated soil, groundwater, and surface water exist at the Site due to historical releases of contaminants associated with industrial activities at the Site.

Documentation on file with the MDEP identifies multiple sulfuric acid spills that have occurred since 1981 in the area surrounding the historical sulfuric acid plant with varying levels of response and cleanup.

The most recent investigation was conducted during 2014 and included verbal input and approval of MDEP VRAP personnel (CES, 2014).

2.5 Conceptual Site Model

The following table summarizes the updated Conceptual Site Model (CSM) for the site after the completion of onsite investigations and sampling in 2014.

SOURCE AREAS	Areas of historical sulfuric acid spills (vicinity of sulfuric acid plant), sulfur storage area (soil bacteria use sulfur to produce sulfuric acid)
PARAMETERS	Low pH
POTENTIAL MEDIA AFFECTED	Soil, groundwater, surface water, stormwater
POTENTIAL EXPOSURE ROUTES	Current exposure pathways: ◆ Dermal risk of decreased pH water in tidal zone Potential exposure pathways:

	- Dermal contact with soil, groundwater, surface water, and/or stormwater
POTENTIAL MIGRATION PATHWAYS	Migration pathways: - Flow of low pH groundwater into tidal zone - Stormwater runoff from exposed soils
RECEPTORS	Potential receptors include: - Current and future site workers - Ecological receptors in tidal zone

SECTION 3 | SITE INVESTIGATIONS

Investigations at the site were conducted in coordination with MDEP verbal discussions, meetings, and a site visit during 2014. The conceptual site model was adjusted based on observations and sampling results completed during our investigations. A summary of the investigations, findings and conclusions, and recommendations are described in the *Investigations Summary Report* (CES, 2014).

SECTION 4 | PROPOSED REMEDIATION AND SHORELINE STABILIZATION

4.1 REMEDIATION OF INLAND AREA – HISTORICAL SULFUR STORAGE AREA

As described in the *Investigations Summary Report* (CES, 2014), the source of the low pH conditions in the intertidal area is likely from groundwater flow from the area of interest (i.e., the historical spills of sulfuric acid in the vicinity of historical sulfuric acid plant and the historical sulfur storage area). Based on the observations from soil borings and test pits completed in the vicinity of the historical sulfur storage area, varying amounts of unused sulfur remain beneath a thin layer of clean gravel. The presence of the unused sulfur beneath ground surface was previously unknown to GAC. As known in the agricultural industry, sulfur is applied to agricultural land in which the soil bacteria use the sulfur to produce sulfuric acid thereby lowering the pH (Michigan State University Extension, 2012). No other materials or waste were encountered in the recent 2014 investigations or previous investigations conducted on the Site that would contribute to the low pH in the intertidal area.

Therefore, the proposed remediation of the inland area of interest will involve removal of visible sulfur to the extent practical and managed in accordance with applicable regulations, and in-situ treatment (i.e., liming). This approach is consistent with the *Guidelines for Landfill Disposal of Sulphur Waste and Remediation of Sulphur Containing Soils* (Government of Alberta, 2011).

The remaining unused sulfur will be excavated to the extent practical using standard excavation techniques (e.g., backhoe, excavator, loader) and stored in a covered, leak-proof container. The recovered unused sulfur will be used in an ordinary manner of use. This remediation activity is within 75 feet of the shoreline, and therefore, cannot be initiated until a Natural Resource Protection Act (NRPA) Permit By Rule (PBR) is submitted and approved by the MDEP. In addition, proper erosion and sedimentation control (E&SC) best management practices must be installed in accordance with the Remediation and Shoreline Stabilization Plan (**Figure 3**) before soil disturbance occurs. The excavation contractor will remove the clean gravel and stockpile on-site for grading material. Once the unused sulfur is removed to the extent practical, a composite sample will be collected in accordance with USEPA SW-846 to confirm that the total residual concentration of sulfur is less than the proposed cleanup goal of 4% [elemental sulfur (S) plus sulphate (SO_4)] in the soil (Government of Alberta, 2011). The remaining soil and clean gravel will be graded as shown on the Remediation and Shoreline Stabilization Plan (**Figure 3**). The purpose of the proposed grading plan is to promote infiltration into the subsurface, minimize stormwater runoff, and to optimize the in-situ treatment using an alkaline product (e.g., limestone).

Once the cleanup goal is achieved and the grading of the area is approved by CES and MDEP, the in-situ treatment (i.e., liming) will be performed as follows:

- a composite sample (USEPA SW-846) will be used to estimate the acid neutralizing capacity (ANC) of the soil;
- the amount of alkaline product needed will be calculated; and
- a combination of finely ground alkaline product (90% passing a 60 mesh sieve) to maximize lime treatment and course crushed limestone (e.g., ½ to 2 inch) to minimize runoff and airborne particulate matter will be applied to the surface in the amount calculated above and in accordance with the Remediation and Shoreline Stabilization Plan (**Figure 3**).

The removal of unused sulfur and in-situ treatment will neutralize the low pH soil and groundwater over time.

4.2 SHORELINE STABILIZATION AND REMEDIATION

MDEP personnel from the Eastern Maine Regional Office (EMRO) have conducted site inspections to evaluate the shoreline and potential erosion. The MDEP concluded that the shoreline did not require any further erosion control or stabilization measures. However, given GAC's environmental stewardship and commitment to proactively ensuring that their operations are conducted consistent with all environmental and other regulatory requirements, GAC is proposing to implement shoreline stabilization in the area of interest. The objectives of the shoreline stabilization are (1) to stabilize any potential erosion within the area of interest, and (2) provide in-situ treatment of the low pH groundwater that is flowing into the intertidal area.

Shoreline stabilization projects require a NRPA PBR to be submitted and approved by the MDEP. Prior to using equipment in or on the shoreline, the contactor will confirm with CES that the proper permit approvals have been received. Also, the E&SC BMPs outlined in Remediation and Shoreline Stabilization Plan (**Figure 3**) must be implemented.

Limestone based rip rap (D_{50}=12 inch, D_{50}=6 inch) will be used as toe of slope stabilization. The area between the normal high water and elevation identified by CES will be excavated. A finely ground alkaline product (90% passing a 60 mesh sieve) will be placed in this area and a geotextile will be placed in accordance with manufacture's recommendations. This toe of slope stabilization will also increase the pH of the groundwater that is flowing into the tidal zone.

Any debris encountered (e.g., cribwork) in the area of concern will be relocated to a storage area on-site. Planting of vegetation and leveling of slopes will be conducted in accordance with Remediation and Shoreline Stabilization Plan (**Figure 3**).

SECTION 5 | MONITORING

GAC conducts frequent monitoring in accordance with their environment licenses. The following monitoring will be added to their routine environmental monitoring program and submitted to VRAP in Electronic Data Deliverable (EDD) format. Up to five surface water and pore water locations within the intertidal area will be sampled and analyzed for pH in accordance with the procedures outlined in the *Investigations Summary Report* (CES, 2014).

SECTION 6 | REFERENCES

Investigations Summary Report, CES, 2014.

Public Communications Plan, CES, 2014.

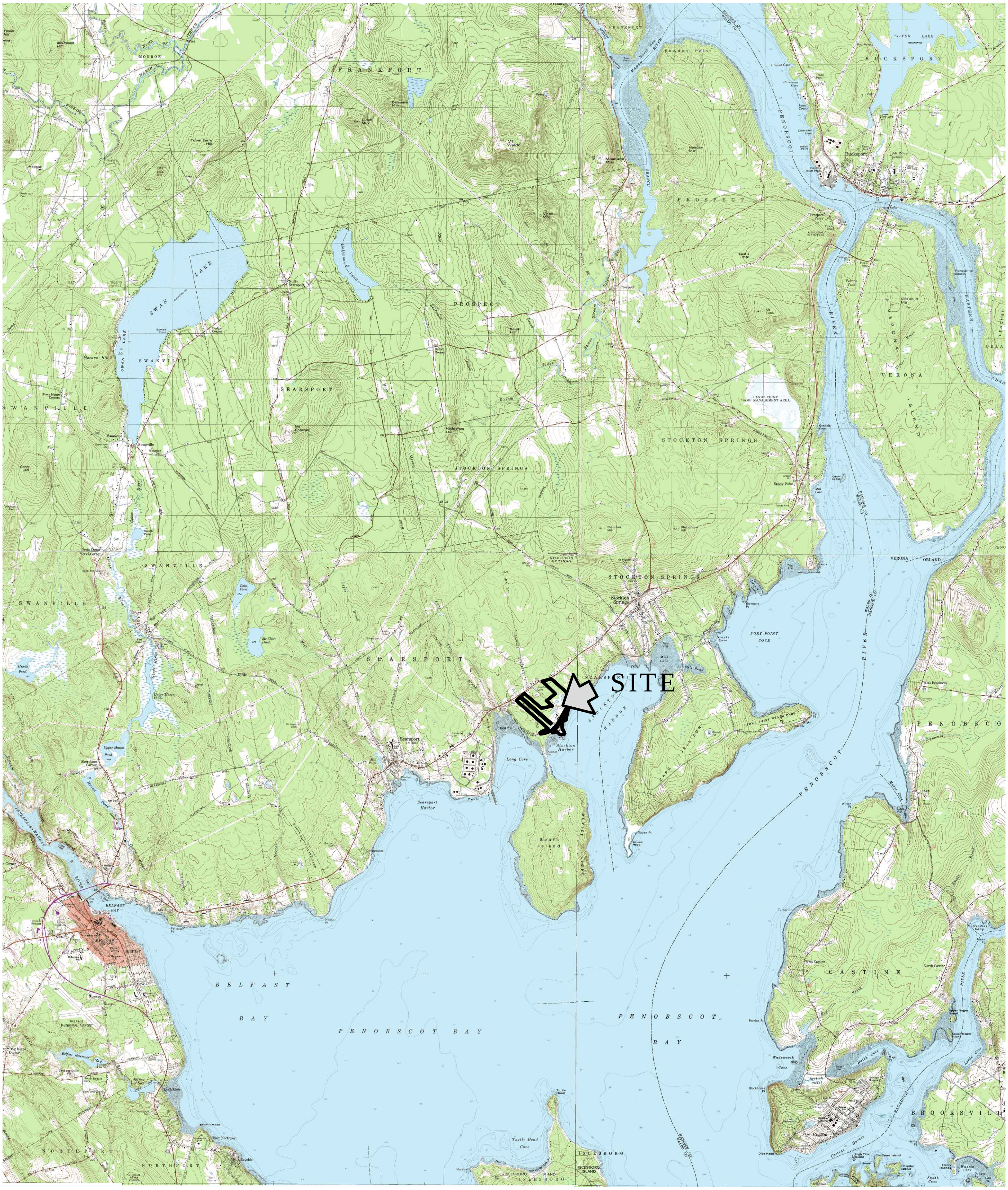
Lowering the Soil pH with Sulfur, Mark Longstroth, Extension Small Fruit Educator, Michigan State University Extension, December 14, 2012.

Guidelines for Landfill Disposal of Sulphur Waste and Remediation of Sulphur Containing Soils, Government of Alberta, September 12, 2011.

FIGURE 1

SITE LOCATION MAP

Terrain Navigator,© Maptech 800-627-7236



SOURCE:
U.S.G.S. TOPOGRAPHIC QUADRANGLE
SEARSPORT
@ 1:24,000

CES INC

GAC CHEMICAL CORP.
SEARSPORT, MAINE

FIGURE 1 - LOCATION MAP

10/28/2014
10060.007

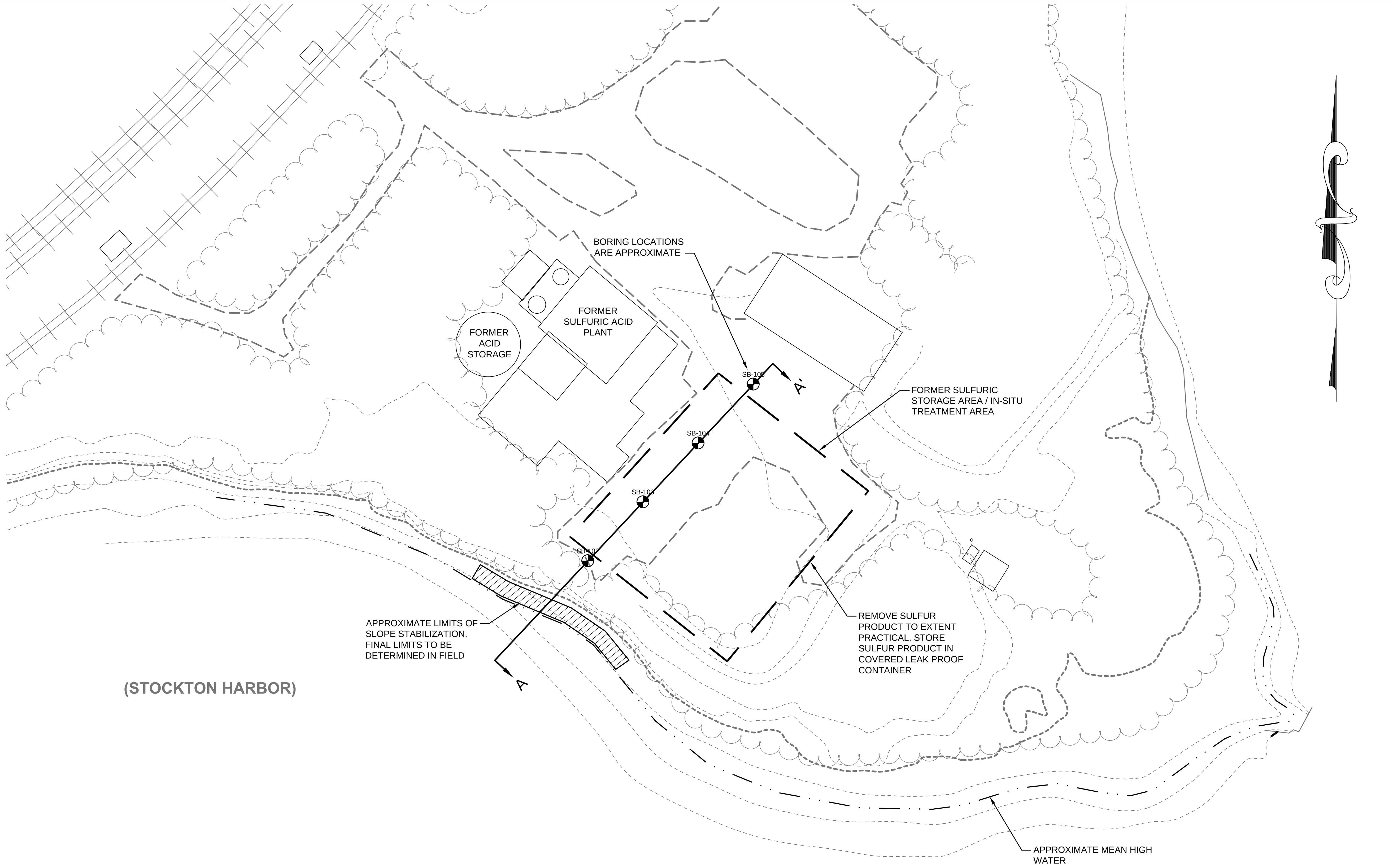
FIGURE 2

SITE PLAN

PROJECT TITLE: **GAC CHEMICAL CORP. SEARSPORT, MAINE**	DWG: **FIG. 2**	BY: BTH	CES INC
		DATE: 10/28/2014	ENGINEERING • SURVEYING • PLANNING • SCIENCES
SHEET TITLE: **FIGURE 2 SITE PLAN**	JN: 10060.007	REV:	
	SCALE:	REV DATE:	

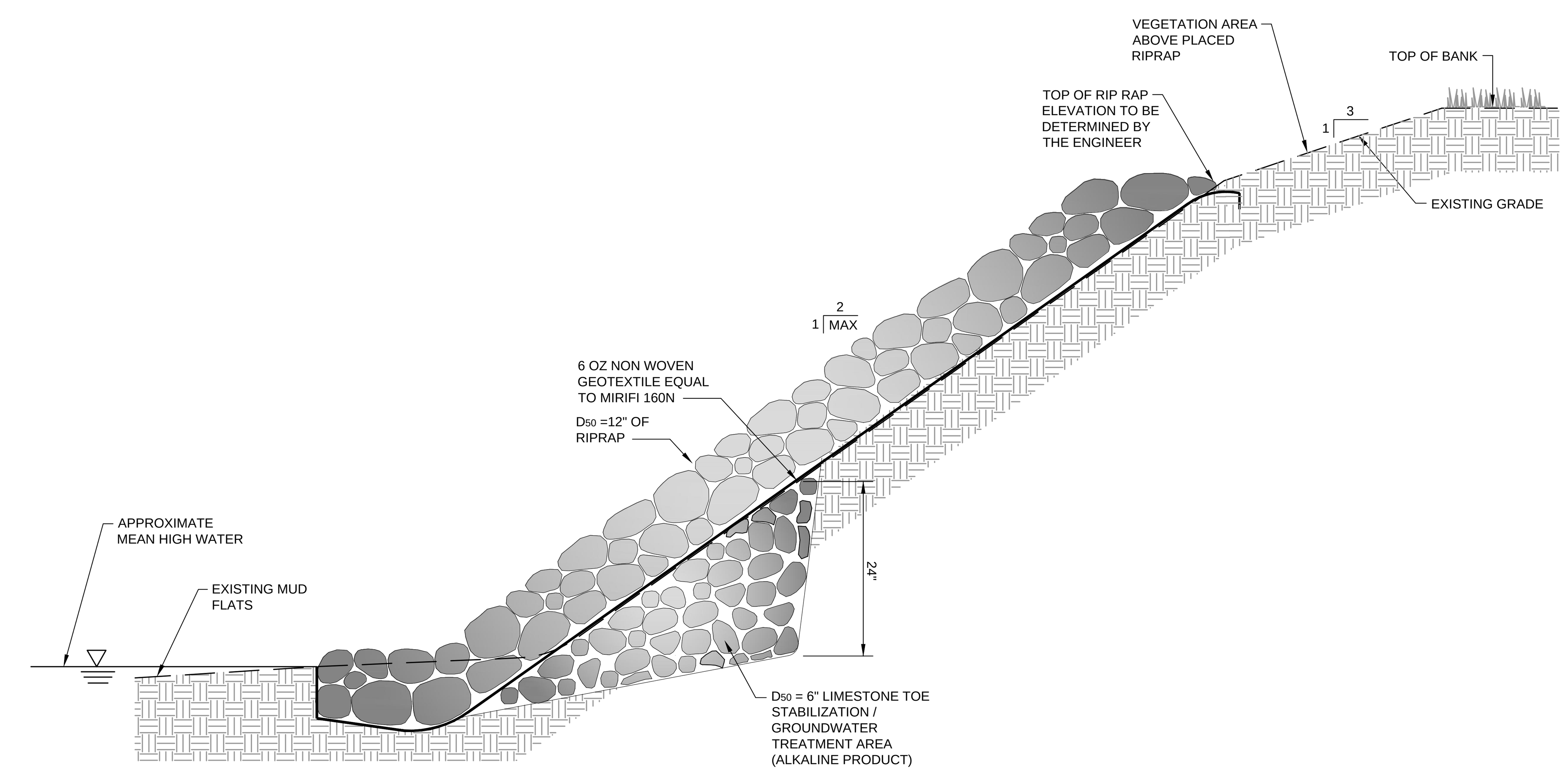
FIGURE 3

REMEDIATION AND SHORELINE STABILIZATION PLAN



PLAN VIEW

SCALE: 1:50



SLOPE STABILIZATION DETAIL

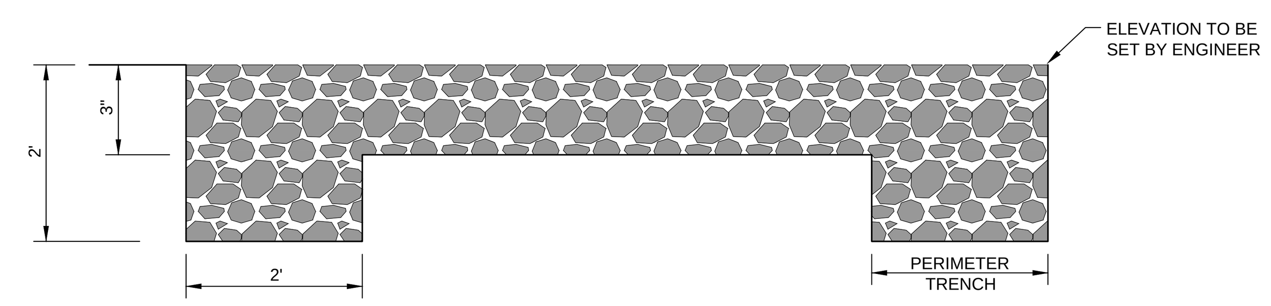
N.T.S.

LEGEND:

DESCRIPTION	EXISTING
EDGE OF GRAVEL	
MAJOR FOOT CONTOUR	
MINOR FOOT CONTOUR	
TREELINE	
RAILROAD TRACKS	
BORINGS	SB-102

EROSION CONTROL NOTES

1. ALL SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE MAINE EROSION AND SEDIMENTATION CONTROL BMPS, PUBLISHED BY THE BUREAU OF LAND AND WATER QUALITY, MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, LATEST EDITION.
2. SILT FENCE WILL BE INSPECTED, REPLACED AND/OR REPAIRED IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR LOSS OF SERVICEABILITY DUE TO SEDIMENT ACCUMULATION. AT A MINIMUM, ALL EROSION CONTROL DEVICES WILL BE OBSERVED WEEKLY.
3. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO CONSTRUCTION SITE.
4. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE STABILIZED BY A SUITABLE GROWTH OF GRASS. ONCE A SUITABLE GROWTH OF GRASS HAS BEEN OBTAINED, ALL TEMPORARY EROSION CONTROL ITEMS SHALL BE REMOVED BY THE CONTRACTOR. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THEY ARE REMOVED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED, SEEDED, AND MULCHED IMMEDIATELY.
5. ALL DISTURBED AREAS WILL BE SEEDED WITH 2.5 LBS. RED FESCUE AND 0.5 LBS. RYE GRASS PER 1,000 SQUARE FEET AND MULCHED AT A RATE OF 90 LBS. PER 1,000 SQUARE FEET OR EQUIVALENT APPLICATION OF SEED AND MULCH.
6. A SUITABLE BINDER SUCH AS CURASOL OR TERRTACK WILL BE USED ON THE HAY MULCH FOR WIND CONTROL.
7. IF FINAL SEEDING OF DISTURBED AREAS IS NOT COMPLETED BY SEPTEMBER 15th OF THE YEAR OF CONSTRUCTION, THEN ON THAT DATE THESE AREAS WILL BE GRADED AND SEEDED WITH WINTER RYE AT THE RATE OF 112 POUNDS PER ACRE OR 3 POUNDS PER 1000 SQUARE FEET. THE RYE SEEDING WILL BE PRECEDED BY AN APPLICATION OF 3 TONS OF LIME AND 800 LBS. OF 10-20-20 FERTILIZER OR ITS EQUIVALENT. MULCH WILL BE APPLIED AT A RATE OF 90 POUNDS PER 1000 SQUARE FEET.
8. IF THE RYE SEEDING CANNOT BE COMPLETED BY OCTOBER 1st OR IF THE RYE DOES NOT MAKE ADEQUATE GROWTH BY DECEMBER 1st, THEN ON THOSE DATES, HAY MULCH WILL BE APPLIED AT 150 POUNDS PER 1000 SQUARE FEET.

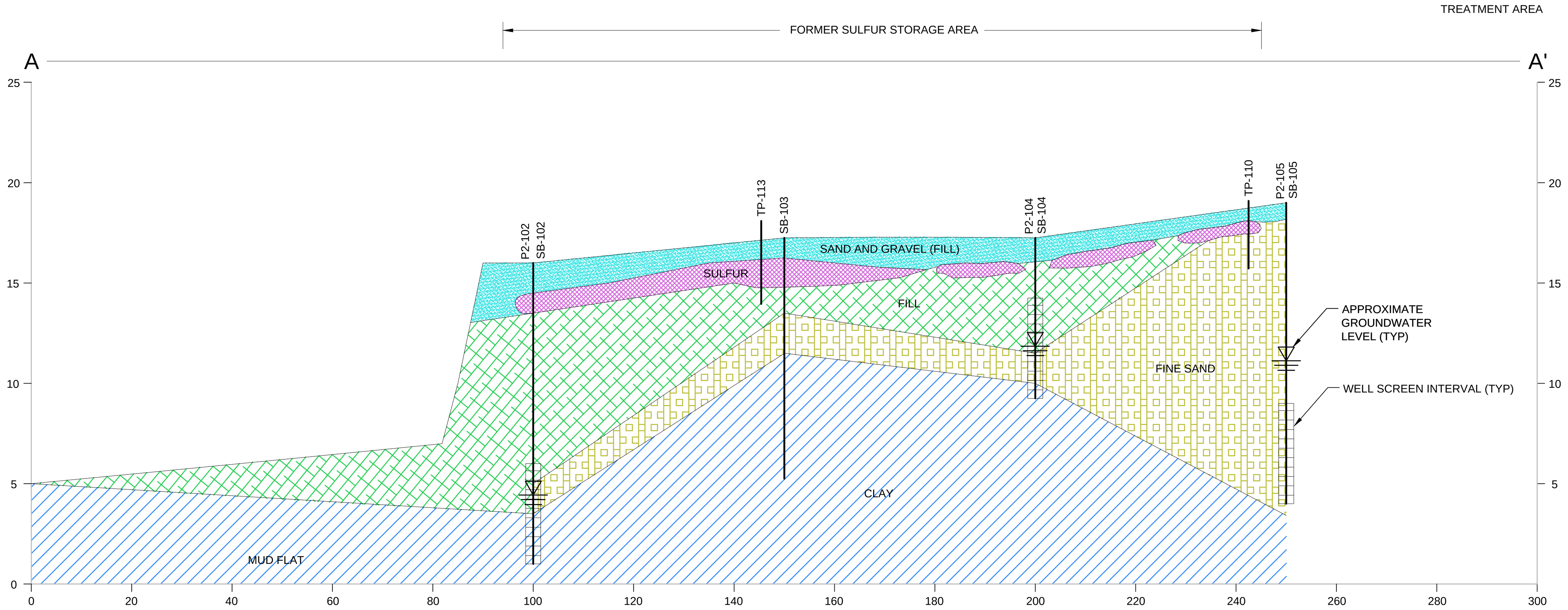


IN-SITU TREATMENT AREA DETAIL

N.T.S.

NOTES:

1. GRADE BOTTOM LEVEL.
2. APPLY ALKALINE PRODUCT IN ACCORDANCE WITH ENGINEERS RECOMMENDATION.
3. PLACE 3" THICK LAYER OF CRUSHED LIMESTONE (1/2" - 2")
4. PLACE TRENCH AROUND PERIMETER OF TREATMENT AREA

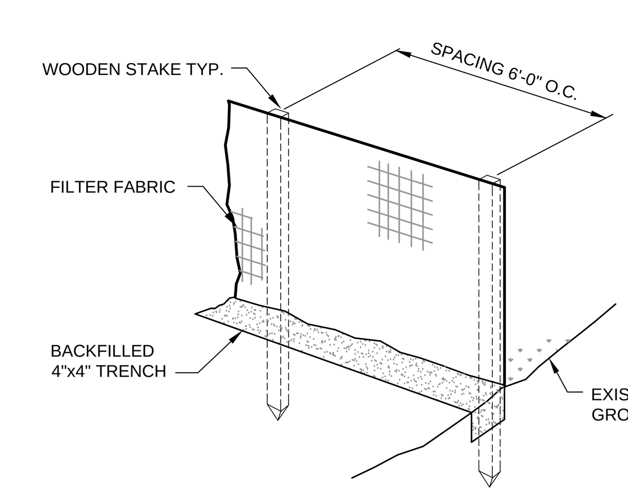


SECTION A-A

SCALE: H = 1:20 / V = 1:5

GENERAL CONSTRUCTION NOTES

1. CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITY WITH OWNER AND ENGINEER.
2. IF UNEXPECTED HAZARDOUS WASTE OR MATERIALS CONTAINING HAZARDOUS WASTE ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY CEASE WORK AND CONTACT THE OWNER, ENGINEER, CONTRACTING OFFICER, AND DEP. WHEN A DEP APPROVED ACTION PLAN IS DETERMINED, WORK SHALL CONTINUE, AND ALL HAZARDOUS WASTE AND MATERIALS CONTAINING HAZARDOUS WASTE SHALL BE DISPOSED OF IN COMPLIANCE WITH THE APPROVED ACTION PLAN AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS.
3. THE CONTRACTOR SHALL PROVIDE ALL LABOR, EQUIPMENT, AND MATERIALS AS REQUIRED TO PERFORM THE WORK AS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE APPLICABLE FEDERAL, STATE AND LOCAL CODES.
4. THE WORK SHALL INCORPORATE EROSION CONTROL MEASURES WHICH ARE COMPLIANT WITH THE LATEST VERSION OF "MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES".
5. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT EQUIPMENT FLUIDS FROM REACHING ANY WATER COURSE. ANY INADVERTENT FLUID DISCHARGES SHALL BE IMMEDIATELY CLEANED FROM THE WATERS USING WHATEVER MEANS NECESSARY, AS DETERMINED BY THE ENGINEER.
6. RESTORE ALL AREA DISTURBED BY CONTRACTOR'S OPERATIONS TO ORIGINAL CONDITION (GRAVEL, PAVEMENT, GRASS, ETC.) UNLESS NOTED OTHERWISE ON PLANS. RESTORATION OF GRAVEL ROAD AND DRIVEWAY SURFACES AND LAWNS DAMAGED BY CONTRACTOR SHALL BE INCIDENTAL TO THE PROJECT.
7. WHENEVER POSSIBLE, EXISTING PLANTINGS SHALL BE PRESERVED BY WHATEVER METHOD NECESSARY INCLUDING TRANSPLANTING AND/OR TEMPORARY RELOCATION.
8. CONTRACTOR TO STOCKPILE GRAVEL CONSTRUCTION MATERIAL IN APPROVED LOCATIONS ONLY.



NOTES:

1. KEY FABRIC IN A 4"x4" TRENCH W/BACKFILL.
2. SILT FENCE SHALL BE A 3' FENCE WITH A MINIMUM GRAB STRENGTH OF 120 LBS.

SILT FENCE DETAIL

N.T.S.

FIGURE 3
REMEDIATION AND SHORELINE STABILIZATION PLAN
FOR
GAC CHEMICAL CORP.
SEARSPORT, MAINE

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

CES INC
Engineers • Environmental Scientists • Surveyors

Brewer
465 South Main Street
PO Box 639
Brewer, ME
T.207-989-4824
F.207-989-4881

Presque Isle
549 Main Street
PO Box 827
Presque Isle, ME
T.207-764-8412
F.207-764-8414

Waterville
44 Main Street
Suite 204
Waterville, ME
T.207-680-2202
F.207-680-2204

Machias
61 Dublin Street
PO Box 587
Machias, ME
T.207-255-3270
F.207-255-8367

Bar Harbor
1366 State Hwy 102
Bar Harbor, ME
T.207-288-0587
F.207-288-0588

Lewiston
640 Main Street
Lewiston, ME
T.207-795-6009
F.207-795-6128

PROJECT TITLE
GAC CHEMICAL CORP.
SEARSPORT, MAINE

SHEET TITLE
FIGURE 3
REMEDIATION AND SHORELINE STABILIZATION PLAN

REV.	DESCRIPTION	DATE	DRAWN BY	CHECKED BY
R1				
R2				
R3				
R4				
R5				
R6				
R7				

SCALE	AS NOTED
DATE	2014-10-24
DRAWN BY	WAB
CHECKED BY	AMD/TRB
DESIGNED BY	TRB/DSP
APPROVED BY	DSP
JOB NUMBER	10060.007
DRAWING NUMBER	FIGURE 3

APPENDIX A

LOWERING THE SOIL PH WITH SULFUR
MICHIGAN STATE UNIVERSITY EXTENSION

Lowering the Soil pH with Sulfur.

Mark Longstroth, Extension Small Fruit Educator

Blueberries prefer acid soils with a pH of 4.5 to 5.5. With the popularity of blueberries many people are interested in quickly adjusting their soil pH. Acidifying soil is not an exact science; this handout is just a guide. The cheapest way to lower the soil pH is to add elemental sulfur to the soil. Soil bacteria change the sulfur to sulfuric acid, lowering the soil pH.

If the soil pH is greater than 5.5, apply elemental sulfur (**S**) to decrease the soil pH to 4.5 (see Table 1). Spring application and incorporation work best. Soil bacteria convert the sulfur to sulfuric acid lowering the soil pH. It is important to note that this is a biological process (slow) and not a chemical reaction (rapid). The bacteria are active, when the soil is moist and warm. The soil temperature needs to be above 55F. The bacteria are not active in the winter so fall applications of sulfur have little effect on the soil pH next spring. In addition, the soil must not be saturated, or flooded (anaerobic) or the sulfur is converted to hydrogen sulfide (rotten egg smell) by anaerobic bacteria. Hydrogen sulfide kills plant roots. Irrigate to maintain soil moisture but do not over irrigate the soil. This causes flooding and anaerobic conditions. Most Michigan irrigation water is high in alkalinity (dissolved lime) and will gradually raise the soil pH.

The amount of sulfur required is dependent on soil texture. Clay and organic matter act as a buffer, absorbing and releasing mineral ions. Relatively little sulfur is needed on sands, whereas soils high in clay or organic matter require much more. It is important to apply and incorporate sulfur at least a year before planting. This allows the sulfur time to react and lower the soil pH before planting. Do not assume that the change can be completed in a short time. If large changes in pH are needed, than the change will that longer than a small change.

Table 1. Elemental sulfur[1] needed to lower pH to 4.5 (lb./acre)

	Soil type		
Current pH	Sand	Loam	Clay
5.0	175	530	800
5.5	350	1030	1600
6.0	530	1540	2300
6.5	660	2020	3030
7.0	840	2560	3830

[1]To substitute ferrous sulfate, multiply by 8.

Sulfur cannot be easily incorporated to the soil after plants are present. Surface-applied sulfur provides the same pH reduction as incorporated material, but takes longer. Check soil pH again before planting and apply additional sulfur if needed. Do not apply more than 400 lb. sulfur per acre at a time to established plantings. When large amounts are needed, spread the application out over several years. Cultivation to aerate the soil and irrigation to maintain soil moisture can speed the process

Ferrous sulfate also decreases soil pH, but it is more costly to use than sulfur. Eight times more ferrous sulfate is needed than elemental sulfur. The ferrous sulfate reaction is quicker, since this salt disassociates into iron and sulfuric acid. The iron binds to the clay or precipitates out of the soil solution leaving the sulfuric acid. Aluminum sulfate also acidifies soils, but there are reports that it can be toxic to blueberries if high rates are applied. Many people want to change the soil pH right now! To do this you need to add acid to the soil. Some growers have even irrigated with dilute sulfuric acid to lower the soil pH. This can cause problems for some irrigation systems. Very acidic water gradually corrodes metal pipes and fittings, and can cause injury if applied directly on plants.

Potential blueberry growers with high pH soils on their potential site need to know the soil texture to determine the amount of sulfur to apply to the site. Soil samples may not give a texture but always give a value for the CEC or Cation Exchange Capacity. The CEC can be used to estimate soil texture. Below are the CEC ranges used to estimate soil texture by the Michigan State University's Soil & Plant Nutrient Laboratory.

The CEC or Cation Exchange Capacity can be used to estimate soil texture

General range of CEC for different soil texture groups:	
Soil Type	CEC
Loamy sand:	< 5 meq/100 g
Sandy loam:	6-8 meq/100 g
Loam:	9-12 meq/100 g
Clay loam:	12-17 meg/100 g

For example, if your soil sample had a soil pH of 6.5 and a CEC of 12-meq/100 g, this suggests a loam soil. Table 1 in indicates over 2000 lb. of S per acre would be needed to reduce the soil pH, 2 pH points, to 4.5. Each pH point is 10 times the value of other points. Two pH points will not double the soil acidity but increase it 100 times. This is a large shift in pH and unlikely to be accomplished quickly. Not a few days or weeks but one or more probably two years.

Ideally, 2,000#/A of sulfur would be applied early in the season the year before planting and the pH would be checked again in the fall and the following spring. If the soil pH was below 5.5 then blueberries could be planted in the spring. If the soil pH was high in the fall and still high in the spring more sulfur should be added before the fall planting of blueberries.

Since more than 400 lb. S should not be applied more than once a year to established plants, correcting the pH here will require 5 years of 400 lb. applications in the spring if the pH was not corrected before planting. I doubt the poor growth of the planting while the pH is being corrected would justify the time saved by planting before the pH was in the 4.5 to 5.5 range.