ALPHA GEOSCIENCE

Geology

Hydrology

Remediation

Water Supply

September 16, 2020

Mr. Robert Call
Deputy Regional Permit Administrator
NYSDEC – Region 8
6274 East Avon-Lima Rd
Avon, New York 14414-9519

Re: Initial Water Withdrawal Permit Application
Eagle Harbor Sand & Gravel, Inc., Eagle Harbor Mine, NYSDEC Mine ID 80171
Town of Barre, Orleans County, New York

Dear Mr. Call:

Alpha Geoscience (Alpha) is pleased to submit this Initial Water Withdrawal Permit Application, on behalf of the Eagle Harbor Sand & Gravel Inc. (Eagle Harbor) to the New York State Department of Environmental Conservation (NYSDEC). The withdrawal permit application is for the proposed mine dewatering system and wash plant at Eagle Harbor's facility in the Town of Barre, Orleans County. This package is also being submitted electronically to your office.

The Applicant Checklist for Water Withdrawal Permit is attached to this transmittal letter. Contact names and information for this permit application are listed below.

Eagle Harbor
Mr. Tom Biamonte, Vice President
Eagle Harbor Sand & Gravel, Inc.
10830 Blair Rd
Medina, NY 14103
585-798-4501

Engineer
Mr. David A. Myers, P.E.
Greystone Engineering, PLLC
24 Ridge Court
Saratoga Springs, NY 12866
518-265-4343

Legal Representative
Mr. Kevin Brown
Brown Duke & Fogel, P.C.
621 West Genesee St.
Syracuse, New York 13204
315-399-4343

Consultant
Mr. Brian Milliman
Geologist
Strategic Mining Solutions
1149 County Highway 27
Richfield Springs, NY 13439
315-725-6259

Consultant
Mr. Steven Trader
Senior Hydrogeologist
Alpha Geoscience
679 Plank Rd
Clifton Park, NY 12065
518-348-6995

The local newspaper is the Batavia Daily News. The newspaper can be contacted by mail at 2 Apollo Drive, Batavia, NY 14020, and by phone at (585) 343-8000. Please contact me with questions regarding this submittal.

Sincerely,
Alpha Geoscience

Steven M. Trader, PG, CPG
Senior Hydrogeologist

Attached Items:

1. Water Withdrawal Permit Application Checklist
2. Joint Application Form
3. Water Withdrawal Application Supplement Form WW-1
4. Water Conservation Program Form (signed)
5. Engineer's Report

cc: Tom Biamonte, Eagle Harbor (electronic)
Brian Milliman, Strategic Mining Solutions (electronic)
David Myers, Greystone Engineering (electronic)

Z:\projects\2015\15121 - 15140\15139 - Eagle Harbor\5_0 Reports\Water Withdrawal Permit\Eagle Harbor Water Withdrawal Permit\Eagle Harbor Water Withdrawal Permit App Transmittal.docx

Attachment 1

Applicant Checklist for Water Withdrawal Permit

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

APPLICANT CHECKLIST FOR WATER WITHDRAWAL PERMIT

Complete this form and include with application

Applicant Name: Eagle Harbor Sand & Gravel, Inc. **Facility Name:** Eagle Harbor Sand and Gravel
Facility Address: 4780 Eagle Harbor Road, Albion, Orleans County, NY 14411 **DEC Region:** 8
Project Type (From WW-1): Water Withdrawal
Water Use (From WW-1): Mine Dewatering **For Department Use: WWA #:**

Item No.	Requirement (*see*, 6 NYCRR § 601.10) http://www.dec.ny.gov/regs/4445.html http://www.dec.ny.gov/lands/94327.html) **	Included or N/A?	Location of Item In Application Package
1	Electronic Copy of Application Package (Recommended)	Included	to be submitted electronically
2	Application Transmittal Letter	Included	Cover Letter of Package
3	Joint Application Form – signed **	Included	Package Attachment 2
4	WW-1 Form **	Included	Package Attachment 3
5	Project Authorization for public water supply (PWS) systems, include legal certification form and proof of transportation corporation formation if applicable **	N/A	N/A
6	General Map - Include location of project and other pertinent features.	Included	Att 5: Eng. Rpt., Plate 1, Figs 1 & 2
7	Watershed Maps – if applicable	Included	Att 5: Engineer's Report, Figure 2
8	Contract plans for non-public water supply systems. Plans for PWS systems should be sent directly to NYS Department of Health (DOH)	N/A	N/A
9	Engineering Report - PE signed and sealed **See Note 1	Included	Att 5: Engineer's Report
10	Water Conservation Program Form – signed **	Included	Package Attachment 4
11	Latest Annual Water Withdrawal Reporting Form (for projects involving existing withdrawals)	N/A	N/A new permit
12	Land Acquisition Maps - if applicable	N/A	N/A
13	Water Analysis - sent directly to DOH if new PWS source	N/A	N/A
14	Project Justification - 8 questions answered	Included	Att 5: Engineer's Report, Section 6.0
15	Canal withdrawal approvals - if applicable	N/A	N/A
16	Great Lakes Basin Diversion - if proposed	N/A	N/A
17	SEQR Form, include Determination if available	N/A	N/A
18	State Historic Preservation Office (SHPO) submission or No Effect Letter from SHPO	N/A	N/A

Note 1: Engineering Report must include hydrologic or hydrogeologic evaluation of water source

Reset Form

Attachment 2

Joint Application Form

New York State Department of Environmental Conservation | Office of General Services | Department of State — US Army Corps of Engineers

JOINT APPLICATION FORM

For Permits for activities activities affecting streams, waterways, waterbodies, wetlands, coastal areas, sources of water, and endangered and threatened species.

You must separately apply for and obtain Permits from each involved agency before starting work. Please read all instructions.

1. **Applications To:**

>NYS Department of Environmental Conservation ☑ Check here to confirm you sent this form to NYSDEC.

Check all permits that apply:

- ☐ Stream Disturbance
- ☐ Excavation and Fill in Navigable Waters
- ☐ Docks, Moorings or Platforms
- ☐ Dams and Impoundment Structures
- ☐ 401 Water Quality Certification
- ☐ Freshwater Wetlands
- ☐ Tidal Wetlands
- ☐ Wild, Scenic and Recreational Rivers
- ☐ Coastal Erosion Management
- ☑ Water Withdrawal
- ☐ Long Island Well
- ☐ Incidental Take of Endangered / Threatened Species

>US Army Corps of Engineers ☐ Check here to confirm you sent this form to USACE.

Check all permits that apply: ☐ Section 404 Clean Water Act ☐ Section 10 Rivers and Harbors Act

Is the project Federally funded? ☐ Yes ☐ No

If yes, name of Federal Agency:

General Permit Type(s), if known:

Preconstruction Notification: ☐ Yes ☐ No

>NYS Office of General Services ☐ Check here to confirm you sent this form to NYSOGS.

Check all permits that apply:

- ☐ State Owned Lands Under Water
- ☐ Utility Easement (pipelines, conduits, cables, etc.)
- ☐ Docks, Moorings or Platforms

>NYS Department of State ☐ Check here to confirm you sent this form to NYSDOS.

Check if this applies: ☐ Coastal Consistency Concurrence

2. **Name of Applicant**

Eagle Harbor Sand and Gravel, Inc.

Taxpayer ID (if applicant is NOT an individual):

Mailing Address: 4780 Eagle Harbor Road

Post Office / City: Albion State: NY Zip: 14411

Telephone: 585-798-4501 Email: shelbystone585@gmail.com

Applicant Must be (check all that apply): ☑ Owner ☑ Operator ☐ Lessee

3. **Name of Property Owner (if different than Applicant)**

Thomas Biamonte

Mailing Address: 10830 Blair Road

Post Office / City: Medina State: NY Zip: 14103

Telephone: 585-798-4501 Email: shelbystone585@gmail.com

For Agency Use Only	Agency Application Number:	

4. **Name of Contact / Agent**

Thomas Biamonte

Mailing Address	Post Office / City	State	Zip
10830 Blair Road	Medina	NY	14103

Telephone: 585-798-4501 Email: shelbystone585@gmail.com

5. **Project / Facility Name**

Eagle Harbor Sand and Gravel

Property Tax Map Section / Block / Lot Number:

Project Street Address, if applicable	Post Office / City	State	Zip
4780 Eagle Harbor Road	Albion	NY	14411

Provide directions and distances to roads, intersections, bridges and bodies of water

☑ Town ☐ Village ☐ City

Town	County	Stream/Waterbody Name
Barre	Orleans	

Project Location Coordinates: Enter Latitude and Longitude in degrees, minutes, seconds:

Latitude: 43 ° 11 ' 4.236 " Longitude: -78 ° 15 ' 42.375 "

6. **Project Description:** Provide the following information about your project. Continue each response and provide any additional information on other pages. **Attach plans on separate pages.**

a. Purpose of the proposed project:

Eagle Harbor has applied to NYSDEC for a modification to its existing mining permit, which is for an above water table sand and gravel mine (ID#8-3422-00003/00001). The proposed modification is for excavation vertically into the underlying limestone bedrock. The purpose of the water withdrawal is to maintain a dry working floor for the proposed limestone bedrock quarry. The Mining Plan Map is included in the Engineer's Report as Attachment 2.

b. Description of current site conditions:

The site is currently a NYSDEC-permitted sand and gravel mine. 149.4 acres of disturbed area have been reclaimed. 85.5 acres are permitted to be mined during the current permit term in accordance with the NYSDEC Mined Land Reclamation Permit. Material is processed at the fixed processing plant (stacker) located on the eastern portion of the property along with the wash pond system, scale, scalehouse and shop building.

c. Proposed site changes:

Sand and gravel will continue to be mined down to the top of bedrock across the proposed footprint of the limestone quarry. A portion of the reclaimed land will also be removed to access the underlying bedrock. A portable processing plant will be used to primary crush the limestone prior to being fed into the existing fixed plant.

d. Type of structures and fill materials to be installed, and quantity of materials to be used (e.g., square feet of coverage, cubic yards of fill material, structures below ordinary/mean high water, etc.):

No new fixed structures or fill materials will be installed.

e. Area of excavation or dredging, volume of material to be removed, location of dredged material placement:

99.7 acre bedrock excavation area within a currently approved 250.6 acre sand and gravel mine area. Approximately 9.5 million cubic yards of limestone will be excavated, processed and sold as construction aggregate.

f. Is tree cutting or clearing proposed? ☐ Yes If Yes, explain below. ☑ No

Timing of the proposed cutting or clearing (month/year):

Number of trees to be cut: Acreage of trees to be cleared:

g. Work methods and type of equipment to be used:

The site will be operated as a traditional sand and gravel mine and crushed stone quarry. Soil stripping in advance of mining will be conducted with bulldozer or equivalent, sand and gravel and shot rock will be mined using excavators, loaders or equivalent, loaded into haul trucks and transported to the processing plant(s). Blasting will be conducted by established industry methods using expert licensed blasters.

h. Describe the planned sequence of activities:

Soil will be stripped back from the advancing faces and the sand overlying the rock will be mined prior to consolidated excavation. Standard drilling and blasting techniques will be used to excavate the rock. Once the rock surface is cleared, blast holes will be drilled in regular patterns in the rock, loaded with explosives in accordance with standards practices in the blasting industry and the explosives detonated. The shot rock will then be loaded by front-end loader, or equivalent, into trucks on the mine floor and hauled to the portable processing plant for crushing. The crushed stone will be then transported to the existing processing plant for sizing. After processing, sized material will be loaded by front-end loader or equivalent into trucks for sale and transportation off-site.

i. Pollution control methods and other actions proposed to mitigate environmental impacts:

Drainage within the quarry area will remain internal as a result of the modification proposal. Grading and perimeter berms will direct all on-site stormwater internally and there will be no off-site discharge of silt laden stormwater. No petroleum-based products will be stored within the quarry area.

j. Erosion and silt control methods that will be used to prevent water quality impacts:

Erosion, siltation and stormwater discharge will be prevented by the use of industry standard erosion and sedimentation controls such as staked hale bales, silt socks or silt fences wherever necessary. Stormwater features will be regularly checked after rain events and maintained to prevent any stormwater from leaving the mine. A sediment basin with a weir will be constructed downline in the ditch that recieves the quarry pumpage.

k. Alternatives considered to avoid regulated areas. If no feasible alternatives exist, explain how the project will minimize impacts:

Water withdrawal is necessary to dewater the bedrock excavation area prior to mining and no feasible alternatives exist. Impacts from water withdrawal will be minimized using increased setbacks from adjacent properties and drawdown impacts will be monitored with monitoring wells.

l. Proposed use: ☑ Private ☐ Public ☐ Commercial

m. Proposed Start Date: ASAP Estimated Completion Date: 50 years

n. Has work begun on project? ☐ Yes If Yes, explain below. ☑ No

o. Will project occupy Federal, State, or Municipal Land? ☐ Yes If Yes, explain below. ☑ No

p. List any previous DEC, USACE, OGS or DOS Permit / Application numbers for activities at this location:

DEC Mine Permit ID#8-3422-00003/00001

q. Will this project require additional Federal, State, or Local authorizations, including zoning changes?

☑ Yes If Yes, list below. ☐ No

Modification to NYSDEC Mining Permit

7. **Signatures.**

Applicant and Owner (If different) must sign the application. If the applicant is the landowner, the **landowner attestation form** can be used as an electronic signature as an alternative to the signature below, if necessary. Append additional pages of this Signature section if there are multiple Applicants, Owners or Contact/Agents.

I hereby affirm that information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief.

Permission to Inspect - I hereby consent to Agency inspection of the project site and adjacent property areas. Agency staff may enter the property without notice between 7:00 am and 7:00 pm, Monday - Friday. Inspection may occur without the owner, applicant or agent present. If the property is posted with "keep out" signs or fenced with an unlocked gate, Agency staff may still enter the property. Agency staff may take measurements, analyze site physical characteristics, take soil and vegetation samples, sketch and photograph the site. I understand that failure to give this consent may result in denial of the permit(s) sought by this application.

False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the NYS Penal Law. Further, the applicant accepts full responsibility for all damage, direct or indirect, of whatever nature, and by whomever suffered, arising out of the project described herein and agrees to indemnify and save harmless the State from suits, actions, damages and costs of every name and description resulting from said project. In addition, Federal Law, 18 U.S.C., Section 1001 provides for a fine of not more than $10,000 or imprisonment for not more than 5 years, or both where an applicant knowingly and willingly falsifies, conceals, or covers up a material fact; or knowingly makes or uses a false, fictitious or fraudulent statement.

Signature of Applicant: [signature] Date: 9/15/20

Applicant Must be (check all that apply): ☐ Owner ☐ Operator ☐ Lessee

Printed Name: THOMAS S. BIAMONTE Title: VICE PRESIDENT

Signature of Owner (if different than Applicant): Date:

Printed Name: Title:

Signature of Contact / Agent: Date:

Printed Name: Title:

For Agency Use Only **DETERMINATION OF NO PERMIT REQUIRED**

Agency Application Number: ____

____ (Agency Name) has determined that No Permit is required from this Agency for the project described in this application.

Agency Representative:

Printed Name: ____ Title: ____

Signature: ____ Date: ____

Required Joint Application Form Attachments

1. Location Map: Engineer's Report, Figure 1 (Package Attachment 5)
2. Project Plans: Engineer's Report, Attachment 2 (Package Attachment 5)
3. Photographs: see following pages

Looking south at freshwater pond #2 from plant

Looking east at shop and scale from plant

Looking west at sediment pond from top of plant

Trough from plant to sediment pond

Looking northwest at plant from shop

Looking southwest at plant from shop

Proposed mining area looking east from Pine Hill Rd.

Proposed mining area looking south on Maple Rd.

Proposed mining area looking west

Proposed mining area looking east

Attachment 3

Water Withdrawal Application Supplement WW-1

May 2013

New York State Department of Environmental Conservation

Water Withdrawal Application Supplement WW-1

Pursuant to 6 NYCRR Part 601

READ THE INSTRUCTIONS ON PAGE 2 BEFORE COMPLETING THIS FORM

FOR DEPARTMENT USE ONLY
Application No.
WWA Number

1. APPLICANT NAME Tom Biamonte

2. FACILITY NAME Eagle Harbor Sand and Gravel, Inc.

3. PROJECT TYPE
- [x] Water Withdrawal
- [ ] Land Acquisition for Public Water Supply
- [ ] New Public Water Supply Service Area or Extension
- [ ] Change in Use of Existing Water Withdrawal

4. WATER USE TYPE
- [ ] Public Water Supply
- [ ] Bottled/Bulk Water
- [ ] Commercial
- [ ] Cooling
- [ ] Industrial
- [ ] Institutional
- [x] Mine Dewatering
- [ ] Oil/Gas Production
- [ ] Power Production
- [ ] Recreational
- [ ] Other:

5. WITHDRAWAL TYPE [ ] Existing [x] New

If this is an existing public water supply, provide the most recent WSA or WWA Number:

If other than public water supply, list other existiing or pending related DEC permits (e.g., SPDES, Mining, Dam): Mining Permit; SPDES

6. WATER WITHDRAWAL SOURCE
- [x] Surface Water — Water Body Name(s): Fresh Water Pond #2
- [x] Groundwater — Nearest Surface Water Body: Fresh Water Pond #1 — Distance From Well (in feet): 175

7. WATER SUPPLY TO OTHER STATES Does this project involve the transport of any fresh water of NYS through pipes, conduits, ditches or canals to any other state?
[x] No [ ] Yes, describe:

8. TRANSPORTATION OF WATER BY VESSEL Does this project involve the transport by vessel of more than 10,000 gallons per day of surface water? (Excludes ballast water necessary for normal vessel activity. A vessel is defined as any floating craft propelled by mechanical power.) [ ] Yes [x] No

9. WATER WITHDRAWAL AMOUNTS This project involves the withdrawal of up to: 1,960,800 gallons per day Source Name: ground water and surface water

Does the project include a MAJOR DRAINAGE BASIN TRANSFER of water? See map at http://www.dec.ny.gov/lands/56800.html [x] No [ ] Yes

If yes, [ ] Existing [ ] New From Basin: To Basin:

10. *REQUIRED EXHIBITS (6 NYCRR Part 601.10)* *Provide the names of the required exhibits applicable to this withdrawal:*

Exhibit	Name
601.10(a) *PROJECT AUTHORIZATION FOR PUBLIC WATER SUPPLY SYSTEMS (e.g. Resolutions, Ordinances)*	N/A
601.10(b) *GENERAL MAP (e.g. Project Location, For Public Water Supplies - water service area boundary)*	Plate 1 - Engineer's report
601.10(c) *WATERSHED MAPS (Topographic map with location of withdrawal and any return flow or interbasin diversions).*	Fig 2 - Engineer's report
601.10(d) *CONTRACT PLANS (Public Water Supplies should submit directly to NYSDOH for review and approval)*	N/A
601.10(e) *ENGINEER'S REPORT (Signed by NYS PE, includes project description, water source yields and demands, etc.)*	Engineer's Report
601.10(f) *WATER CONSERVATION PROGRAM (Completed Water Conservation Program Form)*	Engineer's Report
601.10(g) *ANNUAL REPORTING FORM FOR EXISTING WITHDRAWALS (Most recent submitted annual report)*	N/A
601.10(h) *ACQUISITION MAPS (Map of any lands to be acquired as part of project)*	N/A
601.10(i) *WATER ANALYSES (Public Water Supplies should submit chemical & bacterial analysis directly to NYSDOH)*	N/A
601.10(j) *TREATMENT METHODS (Public Water Supplies - proposed methods to meet NYSDOH standards)*	N/A
601.10(k) *PROJECT JUSTIFICATION (Provide summary statement of answers to the eight justification questions)*	section 6, Engineer's Rpt.
601.10(l) *CANAL WITHDRAWAL APPROVALS (If applicable, provide adequate proof of approval from Canal Authority)*	N/A
601.10(m) *TRANSMITTAL LETTER (Include all contact information for applicant, attorney, engineer, etc.)*	Transmittal Letter
601.10(n) *GREAT LAKES-ST. LAWRENCE RIVER WATER RESOURCES COMPACT PROCESS REQUIREMENTS (Only applicable to Public Water Supply diversions from Great Lakes Basin - no other diversion types are allowed).*	N/A

Clear Form

Applicant Signature: [signature]

Name: THOMAS S. BIAMONTE

Date: 9/15/20

Title: VICE PRESIDENT

Attachment 4

Water Conservation Program Form

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER CONSERVATION PROGRAM FORM

NON-POTABLE WATER WITHDRAWALS

TO BE COMPLETED AND SUBMITTED AS PART OF A
NYSDEC WATER WITHDRAWAL PERMIT APPLICATION
***SEE PAGE 6 FOR FURTHER INTRODUCTION AND INSTRUCTION REGARDING THIS FORM**

If your water facility already has its own written water conservation program, you may submit it as a supplement to this WCPF. If your system is new, indicate the water conservation measures that will be taken when the system is completed (e.g. All sources of withdrawal will be 100% metered).

I. GENERAL SYSTEM INFORMATION

Facility Name: Eagle Harbor Sand & Gravel, Inc.		DEC No. For Dept Use	
Street Address: 4780 Eagle Harbor Road, Albion		WWA No. For Dept Use	
Post Office Box:	**County:** Orleans	**State:** NY	**ZIP:** 14411
Contact Name: Thomas Biamonte			
Street Address: 10830 Blair Road, Medina			
Post Office Box:	**County:** Orleans	**State:** NY	**ZIP:** 14103
Applicant's Telephone: 585 798-4501		**Contact's Telephone:** 585 798-4501	

II. SOURCES OF WATER WITHDRAWAL

[State capacity and withdrawal in gallons per minute (**gpm**), gallons per day (**gpd**), or million gallons per day (**mgd**).]

Source Type: **S** = Surface supply, **G** = Groundwater supply, **P** = Purchased supply
Source Status: **R** = Regular use, **S** = Standby use, **E** = Emergency use, **I** = Inactive, **D** = Decommissioned

Source Name	Source Type	Source Status	Tested Capacity	Actual Current Withdrawal	Start-up Year
Wash Pond	S	S		2,000 gpm	2005
Quarry Dewatering Pump (proposed)	G	R		700 gpm	
(dewatering pump not installed yet)					

III. WATER SOURCES AND METERING

For unmetered systems, please provide your best estimates
for water production and/or consumption.

Are all sources of supply (including major interconnections) equipped with master meters?	No
How often are they read?	the flow meters on the proposed quarry sump discharge will be recording continuously
How often are they calibrated?	it's anticipated that flow meters on proposed quarry sump will be calibrated quarterly
Are there secondary meters located within the facility or system? No	If yes, how many?
Describe secondary metering system if applicable:	

Water Production for Calendar Year		
Total metered water production:	447,120,000	gallons per year
Average day production (total/days of use):	1,968,000	gallons per day
Maximum day production (largest single day):	1,968,000	gallons per day

What are your future goals and schedule for water metering?

The pumping rates and volumes will be closely monitored once the quarry sump pump is installed and operational. The goal is to only pump when necessary to maintain a dry quarry floor for safety and to protect equipment. The results of future water metering may allow for a smaller pump to be installed, along with a lowered pumping rate and withdrawal.

Best Management Practices:

** 100% metering of all sources of water withdrawal.*

** Source and secondary meters must be tested and calibrated annually.*

IV. WATER AUDITING

The process of conducting an audit of a water system will enable the collection of data on how much and where water enters, leaves and is used within a facility or system. Another goal of a water audit is to estimate unaccounted-for water use, which includes: Losses through leaks, improperly-functioning or inoperative system controls and unmetered sources of water. The water audit provides a system with a baseline against which water-conservation measures can be evaluated.

Do you conduct a water audit at least once each year? No If yes, please submit a copy of your latest audit in addition to completing the following section.

** Water Audit for Calendar Year

Total metered water production (from previous section)		Total	447,120,000	
Sources of Water Use	**Metered or Estimated?**			**% of Total**
Process Water	Estimated	subtract		
Cooling Water		subtract		
Wash Water	Estimated	subtract	79,200,000	17.8
Sanitary		subtract		
Incorporation into Product		subtract		
Irrigation		subtract		
Other Quarry Discharge	Estimated	subtract	367,920,000	82.2
Other		subtract		
TOTAL UNACCOUNTED-FOR WATER		Sub-total	**0**	**0**
Unaccounted-for water breakdown	Meter under-registration	subtract		
	Unrepaired leakage	subtract		
	Other:	subtract		
** Water measurement and accounting techniques are available in NYSDEC's Water Conservation Manual, http://www.dec.ny.gov/lands/39346.html			0	

What are your future goals for water system auditing?
No goals for water system auditing in the future. Wash water to be pumped directly from wash pond as needed to the wash plant, with 100' of underground piping. Any leakage would flow back to pond.

Best Management Practices:

** At least once each year, a system water audit must be conducted using metered water production and consumption data to determine unaccounted-for water.*

** Keep accurate estimates of unmetered water use.*

** Quantify all authorized water uses by consumption categories.*

V. LEAK DETECTION AND REPAIR

Do you regularly survey your facility for leakage? Yes
Are leaks repaired in a timely manner? Yes
If applicable, do you regularly survey underground piping for water leakage? Yes

Total length of underground piping	Percent of piping surveyed each year	Length of pipe surveyed each year	Listening equipment used	Year of last survey	Number of leaks found	Number of leaks repaired
100	100	300				

What are your future goals for water system leak detection and repair?
There is 100 feet of underground piping at the site. Leaks would be detected easily as there would be a washout where the leak occurred.

Best Management Practices:

** Check any underground water distribution systems for leaks each year.*

** Fix every detectable leak as soon as possible.*

** Have an on-going system rehabilitation program.*

VI. WATER REUSE, RECYCLING AND DROUGHT PLANNING

Does your facility reuse or recycle primary use water? Yes If yes, describe process:
Wash water that is not evaporated during the wash process will run back into the closed loop surface water system of ditches and ponds, where fines will settle.

Does your facility use reclaimed rainwater, storm water runoff or wastewater? Yes If yes, describe process:
Storm water runoff and ground water that collects in the proposed quarry will be pumped to a surface ditch. A portion of the water will be redirected from the ditch to the primary wash pond as needed (when the water level in the pond is too low).

Describe any equipment or processes that promote the efficient use of water by your facility:
Closed loop wash system with filter fencing. All water not evaporated is reused, with the exception of a portion of wash pond water that also leaves the site in the product. With sand, this could be 2-6% water by weight depending on gradation and how well the pile has drained.

Does your system include storage tanks or ponds to meet short term water demands?
A series of ponds and ditches will be the only source of water to meet the wash water demand. The water pumped from the quarry will be redirected to these ponds and ditches as needed when the water level in the ponds is too low.

Describe any actions that can be taken to reduce water use during times of drought:
Ground water will continue to seep into the quarry during drought. Nothing can be done to reduce the rate that ground water seeps into the quarry. Any water that accumulates in the quarry will be pumped out regardless of the season.

What are your future goals for recycling or reducing water usage?
Attempts to increase water recycling within the closed loop system of ditches and surface water bodies will result in a lesser need to redirect water pumped from the quarry. This would result in more water pumped from the quarry eventually being directed off site as surface water flow.

Best Management Practices:

** Reuse or recycle water whenever possible.*

** Employ efficient irrigation techniques*

** Develop a plan to reduce water use during times of drought.*

VI. SIGNATURE PAGE AND DISCUSSION

Facility Name:	Eagle Harbor Sand & Gravel, Inc.	WWA No. For Dept Use	

Signature:	[signature]	Signatory:	THOMAS S. BIAMONTE
Title:	VICE PRESIDENT	Date:	9/15/20

***DISCUSSION*:**

Effective February 15, 2011, New York State Environmental Conservation Law (§ECL 15-1501) has required that all applications for a NYSDEC Water Withdrawal Permit include a water conservation program. This Water Conservation Program Form (WCPF) is a required submittal of all such applications.

The WCPF has been set up to cover the following basic elements of a water conservation program: Source Water Inventory, Water Usage and Metering, Water Auditing, Leak Detection/Repair, and Water Use Reduction. The Best Management Practices listed at the bottom of each page represent DEC water conservation policy objectives and should be incorporated into your program development. Additional water conservation measures that are specific to your category of water usage should also be incorporated into your individual program.

Water withdrawal permit applicants can consult the NYSDEC publication entitled "A Survey of Methods for Implementing and Documenting Water Conservation in New York".

The American Water Works Association (AWWA) is also an excellent source of information regarding water conservation practices and procedures. Information ranging from technical manuals to online resources and tools can be found at http://www.awwa.org.

Clear Entire Form

Attachment 5

Water Withdrawal Permit Engineer’s Report

WATER WITHDRAWAL PERMIT ENGINEER’S REPORT
as required by
6 CRR-NY Part 601.10 Water Withdrawal Permitting, Application for a Permit
For Eagle Harbor Sand & Gravel, Inc – Eagle Harbor Aggregate Mine
Mined Land ID #80171
DEC PERMIT ID 8-3422-00003/00001

Prepared for

Eagle Harbor Sand & Gravel, Inc
10830 Blair Rd
Medina, New York 14103

September 14, 2020

TABLE OF CONTENTS

1.0 General Description and History of Proposed Project

Eagle Harbor Sand & Gravel, Inc's (Eagle Harbor) Eagle Harbor Mine (MLR# 80171) is a NYSDEC-permitted mine (site) for the mining and processing of sand and gravel from lands leased by the permittee. The site is located on the west side of Eagle Harbor Rd and south of Maple St, approximately three miles west of the Hamlet of Barre Center, in the Town of Barre, Orleans County, New York (Figure 1). The currently approved life-of-mine (LOM) area is 250.6 acres, of which 149.4 acres have been reclaimed and 85.5 acres are permitted to be mined during the current permit term in accordance with the NYSDEC Mined Land Reclamation Permit.

Eagle Harbor has applied for a permit modification to excavate a 99.7-acre bedrock quarry within the currently approved 250.6-acre sand and gravel mine. Sand and gravel will continue to be mined with front end loaders down to the top of bedrock across the proposed footprint of the limestone quarry. A portion of the reclaimed land will also be removed to access the underlying bedrock. A portable primary crusher will be used to crush the limestone prior to being fed into the existing fixed plant, where the aggregate is sorted and washed. Once the overburden has been stripped, the quarry will use drilling and blasting technology to develop the limestone quarry. Mining will occur below the water table; consequently, dewatering in the active quarry area will be necessary. The DEC is requiring Eagle Harbor to apply for a water withdrawal permit as part of the mine permit modification.

Processing for the existing, permitted, sand and gravel mine occurs at a fixed stacker plant located on the eastern portion of the property (Plate 1), where the material is washed and segregated into different piles based upon size. The source of water for the plant is a closed loop system of interconnected ponds and ditches. Water from the nearest pond is pumped to the plant to wash fines from the sand and gravel. The wash water is then returned to the closed loop system. There is no surface water inflow or outflow from the closed loop system, which is illustrated on Figure 2. Plate 1 provides a wider view of the closed loop system of interconnected ponds and ditches relative to the Life of Mine (LOM) boundary, the limestone quarry limits and the other features at the mine.

During the operations in the limestone quarry portion of the site, precipitation, groundwater seepage, and seasonal snow melt will accumulate in the quarry sump, which is located near the southeast corner of the proposed limestone quarry portion of the site (Plate 1). Water will be removed from the sump in order to dewater the quarry area throughout the year. This water will be pumped to a ditch that will lead northward to a sediment pond for further settling (Plate 1). This pond will be outfitted with a weir that will direct overflow from this pond through the surface water system in the northeastern portion of the LOM and then off the site through the culvert at Maple St (Outfall 001). This is the same outfall documented in Eagle Harbor's existing Storm Water Pollution and Prevention Plan.

It is anticipated that a portion of the water pumped from the quarry will be used to supplement the closed loop surface water system, as needed, during dry conditions and for dust control. This supplemental water will be added to the closed loop system through a gated side ditch that is connected to Fresh Water Pond #1, as illustrated on Figure 2. The gate will be opened only when additional water is needed.

The site will be reclaimed by regrading areas above the water table with stockpiled topsoil at the end of mining. The open quarry pit will be allowed to fill naturally to the elevation of the water table.

2.0 General Map of Project

Plate 1 is a general map of the project and its features, including the LOM, the quarry outline, sump, buildings, processing plant, and other features. The sump area is in the southeast corner of the proposed quarry area. The map shows the proposed ditch to which water from the quarry sump will be pumped. The ditch leads to the sediment basin that will be outfitted with a weir. The closed loop system of wash ponds and ditches is shown on Plate 1 and further detailed on Figure 2. No land acquisition is associated with the project. Plate 2 presents the Mining Plan Map that was included with the application for the mining permit.

3.0 Water Sources

The existing water sources at the site consist of a pond (Fresh Water Pond #2, and an on-site water supply well (Shop Well; See Plate 1). Each of these sources is discussed in the following Section 3.1. The quarry sump is the only proposed additional source of water and it is discussed in Section 3.2. A public water supply system in the area is discussed in Section 3.3.

3.1 Existing Water Sources

3.1.1 Fresh Water Pond #2

Fresh Water Pond #2 is the water source for the sand and gravel processing plant and is part of the existing closed loop system of ponds and ditches that have been used for over 40 years. The plant pumps run about 660 hours per year at a rate of approximately 2,000 gpm during hours of operation, or about 79,200,000 gallons per year. The plant operates for about 6 months during the year, which equates to approximately 13,200,000 gallons per month. Two pumps are used simultaneously to supply the plant with water from Fresh Water Pond #2 at a total rate of 2000 gpm (one at 1200 gpm and one at 800 gpm). The maximum daily withdrawal is approximately 960,000 gallons, based on 8 hours of continuous operation at 2,000 gpm.

The water from the pond is used to wash fines from the sand and gravel that is run through the plant and for dust control. The wash water is then returned to the closed loop system where it passes through wide ditches for further settling and then to Fresh Water Pond #1 for further settling. A map of the water flow within the closed loop system is provided in Figure 2. Most of the ditches and ponds are connected by culverts beneath haul roads. Fresh Water Pond #1, however, is connected to Fresh Water Pond #2 via a coarse gravel bed beneath a haul road. There are no streams or diversions of surface water that feed the closed loop system and there are no surface outlets of the system. The ponds are expressions of the water table and are maintained by ground water.

Development of the proposed limestone quarry is not anticipated to cause an increase in water use at the plant since the current average production will be maintained in the future by replacing the sand and gravel, as it is diminished, with limestone as bedrock quarrying commences.

3.1.2 Private Water Supply Well

Eagle Harbor uses a private well (Shop Well) to supply water for the scale house bathroom and the shop. The well was present when Eagle Harbor purchased the operation in 2005. It is not known when the well was installed or its capacity. Water use from this well is minor and occurs only during operating hours. The location of the well is off the southeast corner of the shop building (Plate 1). No additional uses for this well are proposed.

3.2 Proposed Water Source

3.2.1 Description

The quarry sump is the only proposed additional water source. The quarry sump will receive water from ground water that seeps out of the quarry walls, direct precipitation to the quarry surface that becomes storm water runoff, and surface runoff from the area between the quarry and the perimeter berm that will surround the quarry. All of this water will drain to the sump, which is in the lowest part of the limestone quarry.

A full hydrogeologic analysis of the Eagle Harbor site was conducted by Alpha Geoscience (Alpha) and the results are presented in the report Hydrogeologic Evaluation of the Proposed Eagle Harbor Aggregate Mine (Alpha, December 2018) that is part of the current permit modification before the DEC. As part of that evaluation, a water budget analysis was conducted using precipitation and temperature normals from 1981-2010 and accounting for evapotranspiration losses. The results indicated an annualized pumping rate of 288 gpm to maintain a dry quarry. Higher pumping rates would be anticipated during the wet season and lower rates during the dry season. Eagle Harbor intends to install a pump capable of pumping 700 gpm from the sump in order to maintain a dry quarry floor. This will give Eagle Harbor the ability to pump the quarry dry more quickly during more intense precipitation periods. There is no operational demand from the sump other than the need to maintain a dry quarry floor.

The DEC requested that a 72-hr pumping test be performed to simulate the effects of pumping from the quarry sump. The monitoring wells at the site were not conducive for such a pumping test; consequently, an 8-in diameter test well was installed near the proposed sump location to a depth approximating the depth of the final quarry floor. A test pump was selected and installed that would maximize the yield from the well. The well was installed specifically as a test well and will not be used as a potable or non-potable source. The well will be removed as mining commences in that area.

A 72-hr pumping test was performed on the test well in February 2020. The objective of the pumping test was to provide an onsite assessment of hydrogeologic conditions, verify drawdown with distance, and evaluate the potential impact on the wetlands to the southeast and east. The pumping test report entitled *Analysis of the February 2020 Pumping Test at the Proposed Eagle Harbor Aggregate Mine* is attached herein as Attachment 1. The well was pumped at the maximum rate the pump could achieve throughout the test. The average pumping rate was approximately 300 gpm. The test procedures followed a pumping test protocol that was approved by the DEC. The report includes an evaluation of hydrogeologic conditions during the test, data on drawdown with distance from the pumping well, and the results of monitoring potential water level drawdown impacts to the wetlands to the southeast and east of the quarry.

Water pumped from the proposed quarry sump will be diverted to the closed loop system as needed during dry periods to maintain a higher level in Fresh Water Pond #2. The proposed side ditch that will lead to Fresh Water Pond #1, which is in the closed loop wash water system, is shown just east of the sump on Plate 1 and Figure 2. The occasional diversion of quarry water to the closed loop wash pond system will replenish the water table in that area and maintain an eastward limit to the extent of drawdown within the surficial aquifer. This is further explained in the pumping test report in Appendix A. The amount of water diverted from the quarry discharge ditch will depend upon precipitation patterns and water usage at the wash plant. Eagle Harbor reports that the current seasonal fluctuation in Fresh Water Pond #2 is approximately nine feet and depends upon precipitation and water use at the processing plant.

3.2.2 Withdrawal Rates

The proposed maximum rate of withdrawal from the quarry sump is 700 gpm and is based on the reported maximum capability of the pump that will be installed at the sump. Section 4.0, General Design Features, describes the pumping system in more detail. The pump will be operating at up to 700 gpm, 24 hours per day, all year round. The maximum daily withdrawal will be 1,008,000 gallons, which equates to 30,240,000 gallons per month. The pump will be operated on an automatic level control system; consequently, the pump will only be engaged when the water level in the sump is above a certain level (see Section 4.0). It is likely that the pump will not need to be operating continuously. The pump will be cycling more frequently during the wet season or after storm events. It will cycle less frequently during extended dry periods.

3.3 Public Water Supply Systems

There is no public water supply at the site. The Town of Barre has created Water District #9 and has extended a public water supply lines along Maple St (along the northern boundary of the site); along Kams Rd; and along Pine Hill Rd (along the western boundary of the site) (Figure 1). The line has been commissioned by the Town of Barre and residents along these roads have begun to hook up to the public water supply. There will be no public water system demands at the Eagle Harbor mine facility.

3.4 Annual Water Withdrawal Reporting Form

This is the first Water Withdrawal Permit Application for the mine; consequently, no annual reporting form is available.

4.0 General Design Features

The limestone quarry floor will slope gently southward and toward the quarry sump, which is located in the southeast corner. All ground water seepage and surface water runoff from direct precipitation will be directed toward the sump. The quarry floor at the lip of the sump will eventually will be at an elevation of approximately 575 feet above mean sea level (amsl). The operating water level in the sump when the floor is at its final depth is expected to be approximately 573 feet amsl. The primary crusher will be on top of the pit wall to the east of the sump area at an elevation of approximately 673 feet amsl. The center of the pump intake will be at an elevation of approximately 578 feet amsl, just above the top of the sump. The quarry floor will likely not be at the final floor elevation for at least 10 years based upon anticipated customer demand for the product.

The pump that will be used to dewater the quarry during the initial phases is a diesel engine-drive, close-coupled, centrifugal pump with an anticipated maximum continuous performance rated at 2,200 revolutions per minute (rpm) and 700 gpm at up to 55 ft of total dynamic head. The pump may be throttled down to suit conditions in the quarry, or downsized in the future if operational use indicates a smaller pump will suffice to maintain a dry quarry. The 55 ft of total dynamic head takes into account the vertical heads and friction losses throughout the system. A solid, 4-in diameter pipe will extend from the diesel pump up to the top of the quarry. A 90-degree elbow in the piping at the top of the quarry will direct the water to 20 feet of 6-in diameter collapsible hose. The collapsible hose will carry the water to the discharge ditch. The discharge ditch will lead north to the sediment pond where fines will continue to settle (Plate 1). The sediment pond will be outfitted with a weir so that water release is delayed during heavy precipitation events.

A diversion ditch will be installed with a gate to allow some of the water pumped from the sump to enter the closed loop system at Fresh Pater Pond #1 as needed during dry periods (Figure 2). This also will help to maintain a higher level in Fresh Water Pond #2, limit the eastern extent of drawdown within the surficial aquifer, and reduce the amount of flow directed off site at SPDES Outfall 001 (Maple St Culvert on Plate 1).

5.0 Evaluation of Alternatives

There are no practical alternatives which would allow the applicant to mine the limestone bedrock at the site. The applicant must dewater the quarry to mine limestone below the water table.

6.0 Project Justification

The quarry cannot be developed without mining below the water table. The primary purpose of the water withdrawal at the proposed Eagle Harbor Aggregate Mine is to dewater the quarry and maintain a dry quarry floor as it is developed. Most of the withdrawn water ultimately will be discharged at the existing SPDES outfall; however, some of the water will be diverted to supplement the closed loop wash water system as needed during the dry season to maintain the water level at Fresh Water Pond #2 (see Section 4.0). Maintaining the water level at Fresh Water Pond #2 will limit the eastward extent of drawdown within the water table caused by dewatering the quarry. Water from Fresh Water Pond #2 will be used to wash the mined aggregate and for dust suppression on the site as necessary. Diverting some of the water pumped from the quarry to the closed loop wash system during dry periods will also reduce the amount of water ultimately discharged off site.

The proposed project is just and equitable to nearby residences in regards to present and future needs for sources of potable water. The Town of Barre has created Water District #9 and extended its water supply lines to residents along Maple St (north side of the site) and along Pine Hill Rd (west side of the site). The pumping test report (Appendix A) concluded that most of the drawdown impacts within the surficial aquifer were observed within 500 feet of the test well and that most of the drawdown impacts within the bedrock aquifer were observed within 1300 feet of the test well. There are nine residential wells within 1300 ft of the proposed quarry on Pine Hill Rd west and southwest of the site. One residential well on Maple St north of the proposed quarry is within 1300 ft of the proposed quarry. All ten of these residences currently have a reliable public water supply available to them. No other residential wells are that close east and south of the proposed quarry.

The proposed project is just and equitable to other municipalities in regards to present and future needs for sources of potable water. There are no municipalities nearby that currently obtain water from the surficial or bedrock aquifers at or near the site. The Town of Barre obtains its water from the Village of Albion, NY and the source of the Albion water supply is Lake Ontario. All other local municipalities obtain their water from the Village of Albion.

7.0 Water Conservation

An unsigned copy of the Water Conservation Program Form is included in this report as Appendix A. The signed copy of the form is included in the Application Package as Attachment 4.

Water withdrawn from the sump area will be measured with a flow meter that continuously measures the discharge rate. The sump pump will be operated on an automatic level control system. The sump pump will only engage when the water level in the sump rises to 573ft amsl. No other conservation measures are possible in relation to keeping the quarry floor dry.

Water pumped from Fresh Water Pond #2 only occurs during hours of operation when the stacker plant is running. This will remain consistent as the plant converts from sand and gravel to limestone aggregate. The water used at the stacker plant is returned to the closed loop system of ponds and ditches with a minor loss to evaporation. There is a portion of wash pond water that also leaves the site in the product; with sand, it could be 2-6% water by weight depending on gradation and how well the pile has drained.

8.0 Other Approvals or Requirements

The majority of water to be pumped from the quarry sump will leave the site via SPDES Outfall 001 at Maple Street on the north side of the site; consequently, Eagle Harbor's SPDES permit will need to be modified. Some water will be diverted from the quarry discharge ditch as necessary to maintain the water level in Fresh Water Pond #2. Eagle Harbor will update its Storm Water Pollution Prevention Plan accordingly to accommodate the anticipated maximum of 700 gpm that will be pumped from the quarry sump. The water will not be used as a potable source. The water will not be withdrawn from the New York State Canal system or the Great Lakes – St. Lawrence River Basin. Other than the Mining Permit Modification, there are no other necessary approvals.

9.0 PROFESSIONAL ENGINEER CERTIFICATION, SIGNATURE, AND SEAL

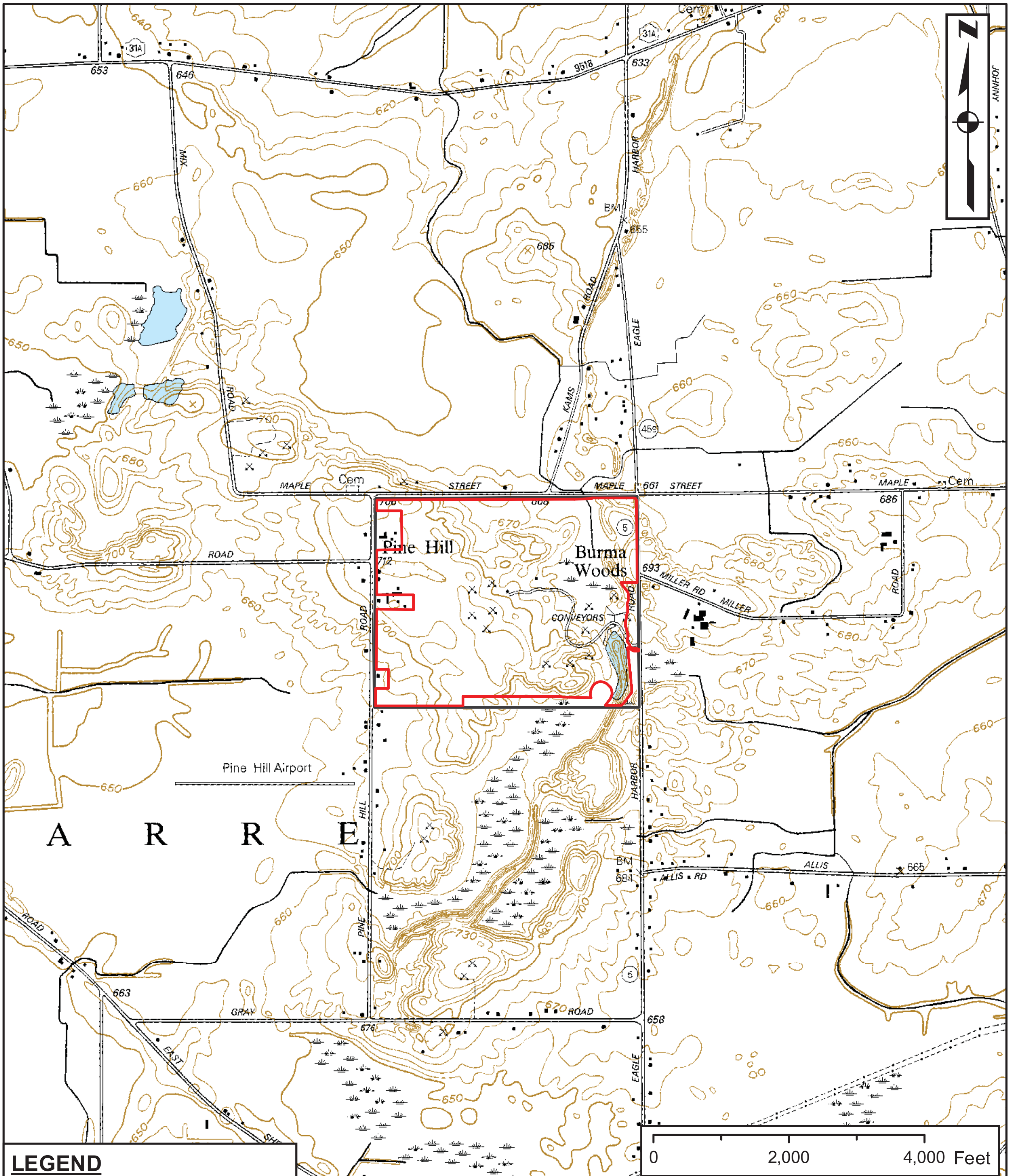
I certify that this engineer's report has been prepared in accordance with good engineering practices and fulfills the requirements of the Water Withdrawal Permit as set forth in 6 NYCRR Part 601.10.

Name: David A. Myers, P.E. Registered Professional Engineer

Signature: DA Myers Date: 9/18/20

Registered Professional Engineer Number: 061989 • State of Registration: New York

FIGURES

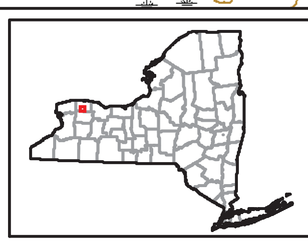


LEGEND

Property Boundary

Life of Mine Boundary

Source:
-NYSDOT 7.5-minute topographic map (Kowlesville and Albion quadrangles).
-Elevations are shown in feet above mean sea level.
-Contour interval is 10 feet.



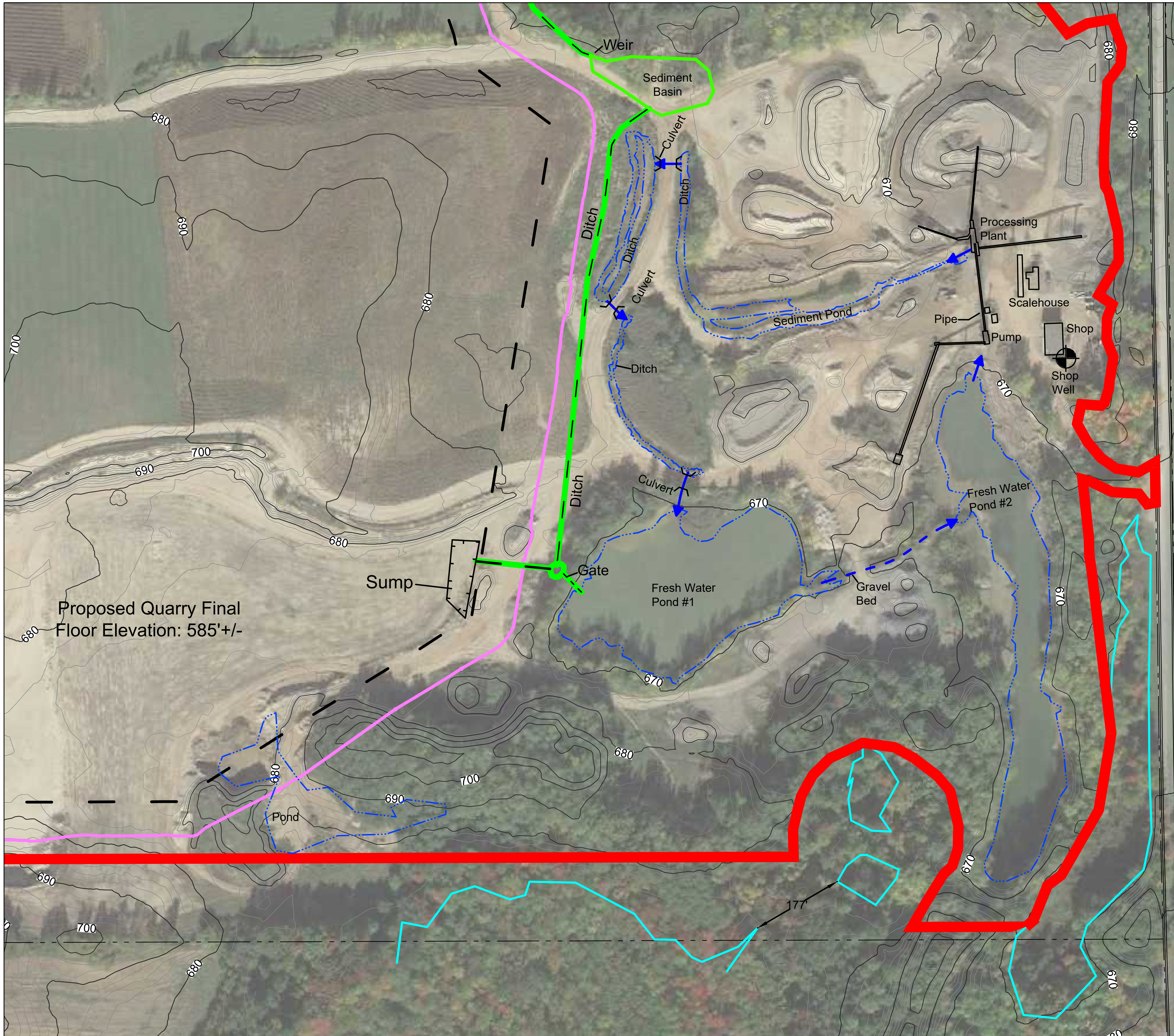
ALPHA GEOSCIENCE

Proj. No. 18109

FIGURE 1
Site Location Map

Eagle Harbor Sand & Gravel Mine
Town of Barre
Orleans County, New York

Path: Z:\projects\2015\15121 - 15140\15139 - Eagle Harbor\15_0 GIS\Fig 1 - Site_Location_Map_LTR.mxd
Date Saved: 11/2/2018 11:20:39 AM



LEGEND

- Property Line
- Life of Mine Boundary
- 10' Contour Line (700)
- 2' Contour Line
- Stream/Edge of Water
- Limit of Future Bedrock Excavation
- Top of Future Graded Stripping Slope
- Proposed Discharge Route
- Direction of Flow within Closed Loop Wash System
- Delineated Federal Wetland Boundary

SCALE

200 0 200 400 600

NOTES

Base Maps & Background Information
1. Base Map provided by Strategic Mining Solutions, Mining and Reclamation Plan Map.

DETAILS

Topographic Survey Date: June 5, 2018
Horizontal Scale: 1" = 200'
Datum: Mean Sea Level
Contour Interval: 2 feet

ALPHA GEOSCIENCE
Project #15139

FIGURE 2

Water Flow Diagram

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.

Town of Barre, Orleans County, New York

Z:\projects\2015\15121-15140\15139 - Eagle Harbor\15_0 GIS\Data\CAD\Water Flow Diagram.dwg

APPENDIX A

Water Conservation Program Form

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER CONSERVATION PROGRAM FORM

NON-POTABLE WATER WITHDRAWALS

TO BE COMPLETED AND SUBMITTED AS PART OF A
NYSDEC WATER WITHDRAWAL PERMIT APPLICATION
***SEE PAGE 6 FOR FURTHER INTRODUCTION AND INSTRUCTION REGARDING THIS FORM**

If your water facility already has its own written water conservation program, you may submit it as a supplement to this WCPF. If your system is new, indicate the water conservation measures that will be taken when the system is completed (e.g. All sources of withdrawal will be 100% metered).

I. GENERAL SYSTEM INFORMATION

Facility Name: Eagle Harbor Sand & Gravel, Inc.		DEC No. For Dept Use	
Street Address: 4780 Eagle Harbor Road, Albion		WWA No. For Dept Use	
Post Office Box:	**County:** Orleans	**State:** NY	**ZIP:** 14411
Contact Name: Thomas Biamonte			
Street Address: 10830 Blair Road, Medina			
Post Office Box:	**County:** Orleans	**State:** NY	**ZIP:** 14103
Applicant's Telephone: 518 798-4501		**Contact's Telephone:** 518 798-4501	

II. SOURCES OF WATER WITHDRAWAL

[State capacity and withdrawal in gallons per minute (**gpm**), gallons per day (**gpd**), or million gallons per day (**mgd**).]

Source Type: **S** = Surface supply, **G** = Groundwater supply, **P** = Purchased supply
Source Status: **R** = Regular use, **S** = Standby use, **E** = Emergency use, **I** = Inactive, **D** = Decommissioned

Source Name	Source Type	Source Status	Tested Capacity	Actual Current Withdrawal	Start-up Year
Wash Pond	S	S		2,000 gpm	2005
Dewatering Pump (Quarry)	G	R			
(dewatering pump not installed yet)					

III. WATER SOURCES AND METERING

For unmetered systems, please provide your best estimates
for water production and/or consumption.

Are all sources of supply (including major interconnections) equipped with master meters?	No
How often are they read?	the flow meters on the quarry sump discharge will be recording continuously
How often are they calibrated?	it is anticipated that the flow meters will be calibrated quarterly
Are there secondary meters located within the facility or system? No	If yes, how many?
Describe secondary metering system if applicable:	

Water Production for Calendar Year		
Total metered water production:	79,200,000	gallons per year
Average day production (total/days of use):	440,000	gallons per day
Maximum day production (largest single day):	720,000	gallons per day

What are your future goals and schedule for water metering?

The pumping rates and volumes will be closely monitored once the pump is installed and operational. The goal is to only pump when necessary to maintain a dry quarry floor for safety and to protect equipment. The results of future water metering may allow for a smaller pump to be installed, along with a lowered pumping rate and withdrawal.

Best Management Practices:

** 100% metering of all sources of water withdrawal.*

** Source and secondary meters must be tested and calibrated annually.*

IV. WATER AUDITING

The process of conducting an audit of a water system will enable the collection of data on how much and where water enters, leaves and is used within a facility or system. Another goal of a water audit is to estimate unaccounted-for water use, which includes: Losses through leaks, improperly-functioning or inoperative system controls and unmetered sources of water. The water audit provides a system with a baseline against which water-conservation measures can be evaluated.

Do you conduct a water audit at least once each year? No If yes, please submit a copy of your latest audit in addition to completing the following section.

** Water Audit for Calendar Year

Total metered water production (from previous section)			Total	79,200,000	
Sources of Water Use		**Metered or Estimated?**			**% of Total**
Process Water		Estimated	subtract		
Cooling Water			subtract		
Wash Water		Estimated	subtract	79,200,000	
Sanitary			subtract		
Incorporation into Product			subtract		
Irrigation			subtract		
Other			subtract		
Other			subtract		
TOTAL UNACCOUNTED-FOR WATER			Sub-total	**0**	
Unaccounted-for water breakdown	Meter under-registration		subtract		
	Unrepaired leakage		subtract		
	Other:		subtract		
** Water measurement and accounting techniques are available in NYSDEC's Water Conservation Manual, http://www.dec.ny.gov/lands/39346.html				0	

What are your future goals for water system auditing?
No goals for water system auditing in the future. Wash water to be pumped directly from wash pond as needed to the wash plant, with 100' of underground piping. Any leakage would flow back to pond.

Best Management Practices:

** At least once each year, a system water audit must be conducted using metered water production and consumption data to determine unaccounted-for water.*

** Keep accurate estimates of unmetered water use.*

** Quantify all authorized water uses by consumption categories.*

V. LEAK DETECTION AND REPAIR

Do you regularly survey your facility for leakage? Yes
Are leaks repaired in a timely manner? Yes
If applicable, do you regularly survey underground piping for water leakage? Yes

Total length of underground piping	Percent of piping surveyed each year	Length of pipe surveyed each year	Listening equipment used	Year of last survey	Number of leaks found	Number of leaks repaired
100	100	300				

What are your future goals for water system leak detection and repair?
There is 100 feet of underground piping at the site. Leaks would be detected easily as there would be a washout where the leak occurred.

Best Management Practices:

** Check any underground water distribution systems for leaks each year.*

** Fix every detectable leak as soon as possible.*

** Have an on-going system rehabilitation program.*

VI. WATER REUSE, RECYCLING AND DROUGHT PLANNING

Does your facility reuse or recycle primary use water? Yes If yes, describe process:

Wash water that is not evaporated during the wash process will run back into the closed loop surface water system of ditches and ponds, where fines will settle.

Does your facility use reclaimed rainwater, storm water runoff or wastewater? Yes If yes, describe process:

Storm water runoff and ground water that collects in the proposed quarry will be pumped to a surface ditch. A portion of the water will be redirected from the ditch to the primary wash pond as needed (when the water level in the pond is too low).

Describe any equipment or processes that promote the efficient use of water by your facility:

Closed loop wash system with filter fencing. All water not evaporated is reused, with the exception of a portion of wash pond water that also leaves the site in the product. With sand, this could be 2-6% water by weight depending on gradation and how well the pile has drained.

Does your system include storage tanks or ponds to meet short term water demands?

A series of ponds and ditches will be the only source of water to meet the wash water demand. The water pumped from the quarry will be redirected to these ponds and ditches as needed when the water level in the ponds is too low.

Describe any actions that can be taken to reduce water use during times of drought:

Ground water will continue to seep into the quarry during drought. Nothing can be done to reduce the rate that ground water seeps into the quarry. Any water that accumulates in the quarry will be pumped out regardless of the season.

What are your future goals for recycling or reducing water usage?

Attempts to increase water recycling within the closed loop system of ditches and surface water bodies will result in a lesser need to redirect water pumped from the quarry. This would result in more water pumped from the quarry eventually being directed off site as surface water flow.

Best Management Practices:

** Reuse or recycle water whenever possible.*

** Employ efficient irrigation techniques*

** Develop a plan to reduce water use during times of drought.*

VI. SIGNATURE PAGE AND DISCUSSION

Facility Name:	Eagle Harbor Sand & Gravel, Inc.	WWA No. For Dept Use

Signature:	Signatory:
Title:	Date:

DISCUSSION:

Effective February 15, 2011, New York State Environmental Conservation Law (§ECL 15-1501) has required that all applications for a NYSDEC Water Withdrawal Permit include a water conservation program. This Water Conservation Program Form (WCPF) is a required submittal of all such applications.

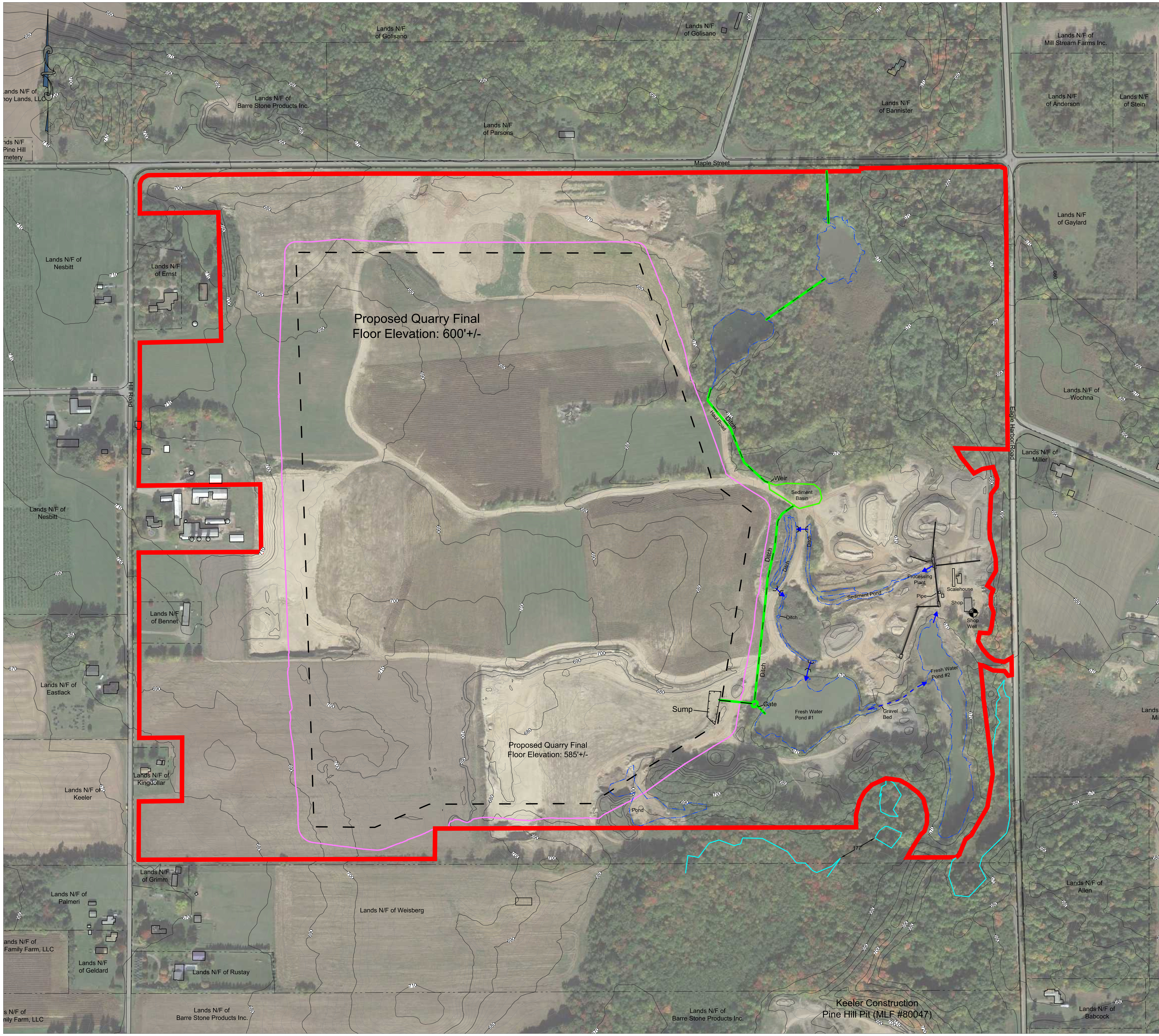
The WCPF has been set up to cover the following basic elements of a water conservation program: Source Water Inventory, Water Usage and Metering, Water Auditing, Leak Detection/Repair, and Water Use Reduction. The Best Management Practices listed at the bottom of each page represent DEC water conservation policy objectives and should be incorporated into your program development. Additional water conservation measures that are specific to your category of water usage should also be incorporated into your individual program.

Water withdrawal permit applicants can consult the NYSDEC publication entitled "A Survey of Methods for Implementing and Documenting Water Conservation in New York".

The American Water Works Association (AWWA) is also an excellent source of information regarding water conservation practices and procedures. Information ranging from technical manuals to online resources and tools can be found at http://www.awwa.org.

Clear Entire Form

PLATE 1



LEGEND

- Property Line
- Life of Mine Boundary
- 10' Contour Line
- 2' Contour Line
- Stream/Edge of Water
- Structure
- Paved Road
- Proposed Limit of Bedrock Excavation
- Proposed Top of Stripping Slope
- Delineated Wetland Boundary
- Culvert
- Direction of Flow within Closed Loop Wash System

SCALE

200 0 200 400 600 800

NOTES

Base Maps & Background Information
1. Base Map provided by Strategic Mining Solutions, Mining and Reclamation Plan Map.

DETAILS

Topographic Survey Date: August 17, 2016
Horizontal Scale: 1" = 200'
Datum: Mean Sea Level
USGS Quad:
Contour Interval: 2 feet

ALPHA GEOSCIENCE
Project # 15139

PLATE 1

SITE MAP

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.
Town of Barre, Orleans County, New York

Z:\projects\2015\15121-15140\15139 - Eagle Harbor\15_0 GIS\Data\CAD\Plate 1 Site Map.dwg

ATTACHMENTS

ATTACHMENT 1

Analysis of the February 2020 Pumping Test at the Proposed Eagle Harbor Aggregate Mine

ANALYSIS OF THE FEBRUARY 2020 PUMPING TEST
AT THE PROPOSED
EAGLE HARBOR AGGREGATE MINE

Prepared for:

Eagle Harbor Sand & Gravel, Inc.
10830 Blair Road
Medina, New York 14103

July 2020

ALPHA GEOSCIENCE

ALPHA
GEOSCIENCE

Geology
Hydrology
Remediation
Water Supply#

ANALYSIS OF THE FEBRUARY 2020 PUMPING TEST AT THE PROPOSED EAGLE HARBOR AGGREGATE MINE

Prepared for:

Eagle Harbor Sand & Gravel, Inc.
10830 Blair Road
Medina, New York 14103

Prepared by:
Alpha Geoscience
679 Plank Road
Clifton Park, New York 12065

July 2020

679 Plank Road • Clifton Park, New York 12065 • (518) 348-6995 • FAX (518) 348-6966

www.alphageoscience.com

Table of Contents

FIGURES

PLATES

APPENDICES

1.0 INTRODUCTION

This report was prepared by Alpha Geoscience (Alpha) for Eagle Harbor Sand and Gravel, Inc. (Eagle Harbor) to present a hydrogeologic analysis of a pumping test conducted at the proposed Eagle Harbor Aggregate Mine in the Town of Barre, NY (Figure 1). The test was requested by the NYSDEC in its NOIA that was issued in 2019. Alpha's protocol for the pumping test was submitted to the NYSDEC and, after several revisions, was approved in an email from Dan Sek (NYSDEC) to Tom Biamonte (President, Eagle Harbor) on January 28, 2020. The objective of the pumping test was to provide an onsite assessment of hydrogeologic conditions, evaluate the potential impact on the wetland to the southeast, and verify drawdown with distance.

2.0 FIELD METHODS

The pumping test was conducted for 72 hours from February 3 (5:47 PM) through February 6 (5:47 PM) and was in accordance with the NYSDEC-approved protocol (Appendix A), with a few minor exceptions, which are discussed below within the appropriate sections. The following sections describe the methods used during the pumping test and the collection of data.

2.1 Pump Setup and Discharge Monitoring

Eagle Harbor, after discussions with its pump vendor, obtained the highest capacity submersible pump that will fit within the 8-inch diameter, bedrock well, PW-1A. PW-1A was drilled and installed after the installation of well PW-1, which is a 6-inch diameter, bedrock well. The well construction logs for both wells are included in Appendix B, and the data are summarized in Table 1. The pump in PW-1A was theoretically capable of achieving 350-400 gpm; however, the actual maximum yield of the pump depends upon the amount of head above the pump and the resistance caused by the discharge hose/piping. The pump was installed in well PW-1A at a depth of 75 feet below grade, which is equivalent to approximately 69.6 feet below the static (non-pumping) water level in the well at the start of the pumping test.

Photograph 1 (Appendix C) shows the setup of the discharge PVC pipe atop PW-1A. The 3-in diameter PVC pipe coming up the well from the pump was connected to 60 feet of 4-in diameter, PVC pipe at the well head. The PVC pipe was connected to 270 feet of 4-in collapsible (Lay Flat) hose, which was connected to 200 feet of 6-in diameter collapsible hose. The collapsible hose was directed to a ditch (Photograph 2) excavated by Eagle Harbor to convey the discharge water northward and further away from the pumping well. The discharge water flowed along the ditch (Photograph 3) and through two corrugated plastic culverts (under access roads) to an outfall approximately 1500 feet north-northeast of the pumping well (Photograph 4). The discharge water entered the surface water features of the northeast portion of the site and ultimately left the site via the culvert beneath Maple Street (Photograph 5). The discharge route is shown on Plate 1.

The discharge rate was measured by recording the time it took to fill a 55-gallon plastic drum from the end of the 6-in hose. Measuring the discharge rate required three people to accomplish: one to hold the drum, one to lift and direct the discharge hose, and one to operate the timer. As a result, the discharge rate was not measured as frequently as indicated in the protocol, nor was it measured at night. Maintenance of the tight schedule of water level measurements was deemed more important than recording the discharge rate every hour for the first 24 hours, especially since adjusting the pumping rate was not an option due to the fact that the pump was operating at maximum capacity. The discharge rate was measured when the opportunity arose throughout the test. The well was pumped at the maximum rate the pump can yield, which started at approximately 326 gpm and averaged approximately 300 gpm over the duration of the test (Table 2).

The flow in the ditch downstream was measured during the test to allow for evaluation of the potential recirculation through the overburden and back to the pumping well. The ditch flow measurements were made at a location approximately 570 feet downstream from the hose discharge location (Plate 1). A Global 200 Flow Probe (Flow Probe) was used to measure flow velocity at several stations along a single transect of the ditch. The flow rate was then calculated by multiplying the velocity measurements at each station by their representative areas, and then totaling the sum of the rates calculated for each station along the transect. Table 2 presents the flow rates that were calculated for the ditch. These calculated flow rates were similar, or greater than, the pumping rate; consequently, it is apparent that recirculation back to the well was negligible since the ditch was dry prior to the start of the test and there are no tributaries to the ditch upstream from the measuring location.

Additional flow measurements were made at the Maple Street Culvert (Plate 1, Photograph 5), which is the outlet for the surface water in the northeastern portion of the site to which the pump discharge was directed. The pre-test measurements were made with a 5-gal bucket and stopwatch. Once the flow became too great to measure accurately with a 5-gal bucket, especially without two people, the Flow Probe was used to measure the flow velocity through the culvert. An online engineering calculator (HawsEDC Calculators) was then used to calculate the flow (gpm) through the culvert. The calculation pages are included in Appendix D. The known parameters (water depth, slope of the pipe, percent of full depth flowing through pipe) were entered into the calculator. The Manning roughness coefficient was then adjusted until the calculated velocity equaled the velocity measured in the field. The corresponding calculated flow, Q, is the flow through the culvert that is shown in Table 2 where indicated. The two calculated flow rates (358 gpm to 368 gpm) are very reasonable given that the pre-test measured flow though the Maple Street Culvert was 63.6 gpm and the pumping rate was around 300 gpm for most of the test. This is also a good indication that there was negligible recirculation of flow back toward the well.

2.2 Monitoring Network for Water Levels

Plate 1 shows the locations of all the wells and staff gauges that were monitored during the pumping test, and Figure 2 is a larger scale map that shows the monitoring locations and features around pumping well PW-1A. Water levels were monitored at all six of the site bedrock wells (PW-1, PW-1A and MW-1 through MW-4); three residential bedrock wells that include: the Barn well (which is not in use), the Parsons well on Maple Street, and the Miller well east of the site; the five shallow overburden (water table) wells (MW-1S through MW-5S); USGS water table well OL-20 (labeled as “USGS Well” on Plate 1 and Figure 2); and, surface water monitoring locations (SG-1, PG-1, WP-1, Maple Street culvert, and Kams Road culvert). All of the water level data are included in Appendix E.

Several new monitoring locations were added for the pumping test after the December 2018 hydrogeologic evaluation report (Alpha, 2018). Shallow overburden monitoring well MW-5S is a two-inch diameter well that was installed on December 19, 2019 in response to comments from the NYSDEC following the November 20, 2019 meeting. Well MW-5S is located between the pumping well and the southeastern wetland (Photograph 6), as requested in the December 12, 2019 NOIA. The driller’s log for MW-5S is included in Appendix B and summarized on Table 1.

Staff gauge PG-1 was installed in the shallow pond that is located approximately 75 feet southeast of pumping well PW-1A. A new staff gauge SG-1 was installed in the process water pond to replace one that had previously been at that location.

Upon arrival at the site on the day of the pump test, it was discovered that wetland well point WP-1 southeast of MW-5S had been broken. The stand pipe was lying on the ground and the subsurface portion of the well point was submerged under water and ice. The submerged portion of the well point was not found. The stand pipe was installed into the wetland to refusal and was used as a staff gauge during the pumping test (Photograph 7). Water was present in the wetland at the time of installation. Temperatures dropped below freezing during the overnight between 2/4/20 and 2/5/20 and a layer of ice formed on the open water bodies (wetland, PG-1 pond, SG-1 pond) that persisted through the end of the test. The ice around the staff gauges (SG-1, PG-1 and WP-1) was broken manually as necessary to maintain open water around the gauges.

No staff gauge was installed in the wetland area to the east of the SG-1 pond; consequently, SG-1 served as a sentinel for water level change in that wetland. Similarly, staff gauges PG-1 and SG-1 served as sentinels for water level change in the SG-3 pond (the SG-3 staff gauge had been damaged). The water exiting the site at the Maple Street culvert is directly connected to the standing water monitored at SG-2 in the northeastern part of the site; consequently, measuring water levels at the Maple Street culvert was deemed sufficient to reflect the water level changes at SG-2.

2.3 Monitoring Frequency

A full round of water levels was obtained by Alpha and Eagle Harbor personnel on the day of the test, prior to starting the 72-hr pumping test to serve as background (static) water levels (Table 3).

Water levels were monitored in pumping well PW-1A frequently during the first hour (approximately one- to ten-minute intervals); approximately every hour for the next seven hours; and every three to four hours until the end of the test (Table 4). A round of water levels from all monitoring points (wells and staff gauges) was obtained approximately every 4 hours (6 times per day); except for the residential wells. The residential wells were not measured during the overnight period for safety reasons. Water level data for the observation wells and staff gauges are contained in Appendix E.

The USGS automatically records water levels at water table well OL-20 every 15 minutes. Alpha obtained the OL-20 water level data from the USGS for the period covering 1/28/20 to 2/18/20. The numerical water level data for OL-20, which cover the period of the pumping test, are presented in Appendix F. The remainder of the data prior to and after the test are shown in graphic form on the hydrograph of USGS Well OL-20 that is contained within Appendix G.

After the pump was shut off at 72 hours, the water level recovery in the pumping well was monitored every minute for the first 10 minutes, and every 10 minutes for the next 50 minutes. The water level had recovered to 95% of its static level at the start of the test by approximately one hour after pump shutdown; consequently, the frequency of water level measurements was eased. A full round of water levels at the monitoring wells was obtained within two hours of pump shutdown, and additional water level measurements were made in some wells during the night. A final round of water levels at all points, including the pumping well, was made the day following pump shutdown (Appendix E).

2.4 Water Quality Monitoring

A water quality sample was collected from the pump discharge near the end of the pumping period and submitted by Eagle Harbor to ALS Environmental laboratory for the following analyses: TCL VOCs via Method 8260, NYSDEC Petroleum SVOCs (CP 51) via Method 8270, EPA 8081 Organochlorine Pesticides, Total Metals (Na, Ca, Mg, Mn, Fe, K and Al), nitrate, nitrite, hardness, alkalinity, sulfide, chloride and total suspended solids. The sample was collected from the end of the discharge pipe at 3:25 PM on 2/6/2020, approximately two hours prior to the end of the pumping test. The laboratory report with the results of analyses is included in Appendix H.

Alpha monitored the following water quality parameters approximately every four hours in the discharge water during the test: temperature, pH, total dissolved solids, and conductivity. These same field parameters were measured approximately every four hours in the water flowing through the Maple Street culvert, except during the overnight period for safety reasons. The results of field water quality monitoring are presented in Table 5.

2.5 Weather Data

Weather data from the NOAA weather station at Albion, NY (NOAA Station ID 300055) indicate that no significant precipitation had occurred near the site for at least a week prior to the test (Table 5). Precipitation in the form of snowfall began at approximately 11:00 pm on February 5, 2020, the final evening of the test, and ended at approximately 9:30 am the next day. A total of approximately 3 inches of snow accumulation was measured at the site. This is consistent with the Albion weather station, which reported that 2 inches of snow fell on February 6, 2020. During the test, the temperature typically got below freezing in the evenings and rose above freezing during the days. The temperature did not drop much below freezing until the night of February 5, when it dropped into the low 20s (°F) and ice began to form on the ponds at the site. Additional snow accumulation, totaling 4.8 inches, was reported at Albion for the two days after the pump was shut down, and the temperatures plummeted below 0 °F (Table 5).

3.0 RESULTS

A total drawdown of 27 feet occurred in the pumping well by the end of the 72-hr test. The drawdown was initially as much as 31 feet when the pumping rate started out at 326 gpm, but as the head dropped, the pumping rate decreased (Table 4; Appendix G Hydrographs). The pumping rate throughout the test was always at the maximum that the pump could sustain with the loss of head in the well and along the discharge line. The pumping rate averaged above 300 gpm. There were fluctuations in the water level throughout the test, but the total drawdown was between 27 and 28 feet for the last two-thirds of the test (Appendix G Hydrographs). This amount of drawdown in the bedrock aquifer potentiometric surface corresponds to a water level that was approximately five feet below the top of bedrock. In contrast, the water table aquifer was drawn down an estimated 3.5 feet near the wellhead. The overburden and the bedrock are connected through fractures in the top of bedrock, but not along the wellbore since the well was grouted into the top 10 feet of the bedrock. This formed a good seal around the well casing.

A series of ground water contour maps was produced to evaluate the changes in the water table and the bedrock potentiometric surface that occurred during the test and to assess the drawdown impacts to the surrounding area. The following sections will discuss these maps and the interpretations derived from them.

3.1 Water Table

The water table aquifer (surficial aquifer) occurs within the unconsolidated sand and gravel deposits at the site. The surficial aquifer is recharged via direct precipitation on the sand and gravel. The depth to water in the surficial aquifer ranges from several feet to over 30 feet at the site. The response of the water table aquifer during the pumping test is discussed in the following sections.

3.1.1 Water Table – Pre-Test

The pre-test static water levels were used to construct a ground water elevation contour map that represents the water table just prior to the pumping test (Plate 2). The map indicates that there is a local water table high in the southwestern portion of the site, with most of the ground water flow directed northward, eastward and southeastward, which is toward the southern wetland. This is consistent with the topographic high that is associated with the kame terrace deposits in the same area (Figure 1; Plate 1). There is some ground water flow within the surficial aquifer to the southwest off the topographic high.

3.1.2 Water Table – End of Test

The last round of measurements in the water table wells, prior to pump shut down (Table 3), were used to construct a ground water contour map representing the water table at the end of the test (Plate 3). Drawdown of approximately 1.3 feet was observed at Wells MW-1S and MW-5S, which are nearly equidistant from pumping well PW-1A. No drawdown was observed in any of the other water table wells (Appendix E, Appendix G), including MW-4S, which is the next closest monitoring well. The hydrographs of MW-1S and MW-5S indicate that the water levels in those wells had not stabilized by the end of the test and were still declining at the end of the test.

The Pre-Test and End-of-Test water table maps were overlain to generate a water table drawdown map (Plate 4). Although there was no shallow monitoring well at the pumping well, the amount of drawdown closer to the well is assumed to have been between three and four feet, based on the maximum sustained gradients observed on the pre-test water table map. The majority of the water table drawdown impact, i.e., greater than one foot of drawdown, was within approximately 500 feet from the pumping well. Beyond 500 feet, the water table configuration was relatively unchanged. The following sections address the impact, or lack of impact, on the surface water bodies, which are surface expressions of the water table.

3.1.2.1 SG-1 Pond

The SG-1 pond exhibited no decline in water levels and was not impacted by the pumping test (Table 3); consequently, the delineated wetland area east of the SG-1 pond (adjacent to Eagle Harbor Road on Plate 1), also was not impacted. Three inches of snow fell at the site during the early morning hours of the final day of the test, with several more inches of snow falling over the next two days, as discussed in Section 2.5. The snowfall resulted in a 0.11-foot rise in the SG-1 pond water level over the next two days after the pump was shut off.

3.1.2.2 PG-1 Pond

Pond gauge PG-1, which is only 83 feet away from the pumping well, showed an apparent drawdown of approximately 0.27 feet during the test. This is interpreted to be actual drawdown and not a natural water level decline. This interpretation is predicated on the fact that no water level decline was observed in pond gauge SG-1 and the PG-1 pond level also showed an apparent rebound after the test was over

The PG-1 pond is only about one foot deep and is also an expression of the water table. The PG-1 pond exists as the result of exploratory mining by Eagle Harbor that revealed that the material in that area was too fine to be a saleable product. The less permeable material beneath the pond is the reason the pond level did not decrease at the same rate or magnitude as the water level in wells MW-1S and MW-5S, which are screened directly across the water table in more permeable materials and further away from the pumping well. Given continued pumping, it is anticipated that the PG-1 pond level would have eventually completely drained. The material beneath the pond is a very fine sand that is more permeable than the material beneath the southern wetland, which is described by Bradford et al. (1977) as the Carlisle Muck. The Carlisle Muck is indicated to be poorly drained and underlain by silt that limits, or retards, percolation.

The water level in PG-1 dropped slightly for over an hour after the pump was shut down. The total drawdown was 0.27 feet at end of test and was 0.29 feet over an hour after test (Appendix E). Based on the monitoring well data, the water table had actually dropped to an elevation beneath the pond and had not yet fully recovered by that time; consequently, the PG-1 pond level continued to drop (drain) until the water table returned close to its pre-test elevation.

3.1.2.3 WP-1 Wetland

The water level data from staff gauge WP-1 indicates that the water level dropped 0.14 feet in the southern wetland during the test (Table 3; Appendix E; Appendix G). The fact that there was an apparent water level recovery in the wetland subsequent to shutting off the pump suggests that there was a very slight impact to the surface water within the wetland; however, it is difficult to assess this potential impact due to the weather effects. Several inches of snow accumulated at the site on the last day of the pumping test, as well as several more over the next two days after the test (Table 6). As a result, it is hard to differentiate water level recovery from water level rise from the snow. The SG-1 pond appeared to rise 0.11 feet in response to the snow accumulation, so a large portion of the apparent recovery at WP-1 could be attributed to the snow. Regardless, the apparent drawdown is very minor and had stabilized by the end of the test, with only 0.01 feet of change over the last 24 hours of the test. The northern edge of the wetland is located at the limit of the pumping test drawdown impact within the surficial aquifer (Plate 4).

The southern wetland drains toward the south and southeast and eventually leads to an unnamed stream where it abuts Pine Hill Rd (Figure 1). The topography of the northern part of the wetland is very flat (Figure 1); consequently, the local drawdown from the quarry may induce minor northward flow from the northern part of the wetland to replace the amount that was lost to drawdown. This may result in a concomitant seasonal reduction in flow to the unnamed stream at Pine Hill Rd. The flow reduction will be negligible because the wetland is sustained by direct precipitation and runoff from the higher topography directly to the east and west (Figure 1). Unlike the PG-1 pond, the wetland is not sustained by flow from the mine site area on the north side of the wetland.

3.1.2.4 Eastern Wetland

The NYSDEC expressed concern about the potential impact of the quarry on the wetland alongside Eagle Harbor Rd, east of the SG-1 pond (Plate 2). The NYSDEC staff consider this 1.58-acre wetland to be the headwaters of a stream east of Eagle Harbor Rd (Figure 1). The stream is an unnamed tributary to Otter Creek; however, it is noted that there is no culvert beneath the road connecting the wetland to that unnamed tributary. Any connection to the stream would have to be through the subsurface as ground water.

The SG-1 Pond, which is between the pumping well and the quarry, was not impacted by the pumping at PW-1A; consequently, it is reasonable to assume that the eastern wetland, which is further away from PW-1A, was also not impacted during the test.

Eagle Harbor will need to maintain water in the SG-1 Pond in order to continue its use as the source of water for the wash plant as the quarry is developed. This will be accomplished by diverting quarry discharge to the pond as necessary. The continued replenishment of the SG-1 pond will establish an eastward limit to the drawdown of the surficial aquifer; consequently, the wetland east of the SG-1 pond will not be impacted and neither will the unnamed stream to the east.

3.2 Bedrock Aquifer

The bedrock aquifer receives most of its recharge from the overlying sand and gravel aquifer where it is in contact with the bedrock. This recharge from the overburden is much less in those areas where discontinuous or patchy silty/clayey layers occur and can limit, or retard, recharge and result in a confined, or semi-confined bedrock aquifer. There is a downward vertical gradient from the sand and gravel aquifer to the bedrock aquifer, as evidenced by water levels in the well pairs at the site (Alpha, 2018). The response of the bedrock aquifer during the pumping test is discussed in the following sections.

3.2.1 Bedrock Aquifer – Static

The pre-test static water levels from the bedrock wells were used to construct a ground water elevation contour map representing the bedrock aquifer potentiometric surface just prior to the pumping test (Plate 5). The map indicates that there is a local ground water high in the southern portion of the site, with ground water flow directed outward toward the northeast, northwest, and southwest. This is generally consistent with the original topographic high that is associated with the kame terrace deposits in the same area (Figure 1; Plate 1).

3.2.2 Bedrock Drawdown

The drawdown values for the bedrock aquifer wells on Table 3 were plotted on graphs to help evaluate drawdown with distance from pumping well PW-1A. Figure 3 is a plot of the drawdown at wells located along a northeast and southwest line through PW-1A. Figure 4 is a plot of the drawdown at wells along a northwest-southeast line through PW-1A, roughly orthogonal to the plot in Figure 3. Figure 4 indicates a steeper drawdown curve compared to that shown in Figure 3. This indicates there is lower storage in the northwest-southeast oriented fractures than in the northeast-southwest direction. This is consistent with published information in Tepper et al., 1990 that indicates that the "two main systematic fracture sets within the Lockport Group are an east-northeast calcite vein set and an east-northeast joint set." The joint set is the relevant feature, not the calcite vein set, because the joints are open fractures which can transmit water. The study included measurements from Lockport Group outcrops at the Shelby quarry eight miles west of the site.

The distance-drawdown graphs were used to help draw a map of ground water drawdown contours for the bedrock aquifer (Plate 6). The contours reflect an asymmetry of drawdown within the bedrock aquifer that is interpreted to be reflective of the underlying preferential drawdown along the northeast trending fracture sets. Most of the bedrock aquifer drawdown impact (greater than 5 feet) was within 600 feet of the pumping well in the northwest-southeast direction and within 1300 feet in the northeast-southwest direction from the pumping well.

The lateral extent of drawdown impact away from the pumping well was greater than the extent of drawdown that was predicted from the proposed quarry face in the 2018 Hydrogeological Evaluation (Alpha 2018). The Hydrogeological Evaluation indicated that most of the drawdown impacts would be within 400 ft of the quarry face.

3.2.3 Bedrock Aquifer End of Test

The last round of water levels from the bedrock wells prior to pump shut down (Table 3) was used to construct a ground water contour map representing the bedrock aquifer at the end of the test (Plate 7). The bedrock aquifer drawdown contours in Plate 6 were overlain with the pre-test static water level contours of Plate 5 to help guide the end-of-test ground water contours represented on Plate 7. The end-of-test ground water contours for the bedrock aquifer indicate an asymmetric drawdown “trough” around the pumping well that stretches further in the northeast-southwest direction than it does in the opposite direction. This indicates that most of the water was being pulled from along the northeastern oriented bedrock fracture system. A remnant of the pre-test ground water “ridge” is still present in the northwestern part of the site.

Bedrock wells MW-1, MW-2, MW-3, MW-4, and Barn all were impacted to varying extents during the tests, but their hydrographs indicate that the drawdown had stabilized in those wells approximately half way through the test (Appendix G). The Parsons well was in use off and on throughout the test, and the data from that well indicate that either there was no impact, or that the impact was negligible. The Miller well was unaffected.

3.3 Water Quality

The results of laboratory analysis on the water quality samples collected from the pump discharge near the end of the test are included in Appendix H. The results are mostly unremarkable, with two exceptions. Iron was reported at 680 µg/L, which is above the NYS DOH standard (or MCL – maximum contaminant level) of 300 µg/L for public water supplies. This MCL is also recommended for individual residential water supply wells. The lab report also indicates that the total of nitrate plus nitrite was 10.9 mg/L. The drinking water standards for nitrate and nitrite are 10 mg/L and 1 mg/L, respectively. These results indicate that either nitrate or nitrite was at, or above, the recommended standard in the discharge water from PW-1A.

The results of field water quality monitoring of the PW-1A pump discharge and the Maple Street culvert are presented in Table 5. The pump discharge stabilized at 600 µS/cm specific conductivity, 300 ppm total dissolved solids (TDS), and a pH of 7.5. The Maple Street culvert conductivity, TDS and pH started at 497 µS/cm, 247 ppm and 8.4, respectively. Each of these parameters increased or decreased as expected due to the influence of 300 gpm from PW-1A, but all had stabilized by the end of the test.

4.0 DISCUSSION

The pumping test was conducted at approximately 300 gpm for most of the test and the drawdown in the pumping well was approximately 27 feet (Table 3). The pump setting was approximately 75 feet below grade, or at an equivalent elevation of approximately 600 feet. The PW-1A water level elevation at the end of the test was at an elevation of 642.78 feet, which is approximately 4.5 feet below the top of bedrock. The base of the proposed quarry at that location would be 580 feet in elevation. Eagle Harbor, Alpha and the NYSDEC were all aware prior to the test that the pump would not be able to draw the water level down to the pump, despite the fact that the pump was the largest capacity pump that could be obtained for the 8-in diameter well. Still, the objectives of the pumping test were to assess the onsite hydrogeologic conditions, evaluate the potential impact on the wetland to the southeast, and to verify drawdown with distance.

The hydrogeologic conditions and drawdown with distance were evaluated through a series of graphs and ground water contour maps, as discussed in Section 3. The impact to the southeastern wetland (ACOE wetland on Plate 1) during the test was minor (0.14 feet) since it had stabilized over the last 24 hours of the test. The behavior of the wetland and the rebound in PG-1 pond that was much slower than the water levels in the bedrock and water table wells after pump shutoff, are consistent with the interpretation that there are semi-perched areas within the unconsolidated deposits.

Given that the pumping test could only be run at about 300 gpm, and the drawdown in the pumping well was only a fraction of the available drawdown, it is important to try to understand how much of the water was coming from the bedrock and how much was coming from the surficial aquifer (sand and gravel). It is Alpha's interpretation that most of the water was actually coming from the surficial aquifer and not the bedrock aquifer. The bedrock wells had all stabilized by the end of the test, whereas the impacted water table wells (MW-1 and MW-5) were still declining at the end of the test. If most of the water is coming from the sand and gravel aquifer, then the flow from that aquifer will drop significantly once the local aquifer has been drained and removed above the proposed quarry area during mining.

A hydrogeologic analysis using Darcy's Law was conducted on the surficial aquifer to estimate how much of the pump discharge water might have been coming from the surficial aquifer. Darcy's Law governs fluid flow through porous media and can be expressed as $Q = kiA$, where Q= discharge (flow), k = hydraulic conductivity of the aquifer, i = hydraulic gradient of the water table (rise over run), and A = saturated cross-sectional area perpendicular to the hydraulic gradient.

Hydraulic Gradient, i

Five hydraulic gradient lines were chosen to represent the ground water flowing toward the pumping area. These lines are labeled A through E on Figure 5 and are perpendicular to the ground water contours. The hydraulic gradient (i) along each of these lines was calculated in Table 7 by dividing the difference in head along the lines by the lengths of the lines (rise over run).

Cross-Sectional Area, A

The cross-sectional area associated with each gradient line is the representative area that the flow along each gradient line is passing through (orthogonal to the flow direction). The centers of the hydraulic gradient lines were joined by a curvilinear line to represent an entire cross-sectional area that the flow is passing through on the way to the pumping area (Figure 5). The total cross-sectional area was subdivided by establishing "midpoints" to separate segments of the drawdown that are representative of differences in gradient around the pumping well. These midpoints were selected between the hydraulic gradient lines. For example, the midpoint between hydraulic gradient lines A and B is *AB*, and hydraulic gradient line A is associated with the cross-sectional area line *EA* to *AB*. The representative length of each cross-sectional area line, midpoint to midpoint, is shown on Table 7.

The average saturated thickness along the cross-sectional lines was determined by subtracting the top of bedrock elevation from the ground water elevation along each of the lines, midpoint to midpoint. A structural map of the top of bedrock was created based on the known depth to bedrock at the monitoring wells (Plate 8). Other wells or historical borings, which did not encounter bedrock, were also used to project a depth if the original grade and total depth were known. The average water table elevations and average bedrock elevations for each cross-sectional area line segment, midpoint to midpoint, are shown on Table 7. The cross-sectional areas for each line segment were calculated by multiplying the saturated thickness by the length of the line segment (Table 7).

Hydraulic Conductivity, k

The sediments at the site were discussed in Alpha, 2018, and are mapped as kame deposits, which could include kames, eskers, kame terraces, or kame deltas (Cadwell, 1988). Lacustrine silt and clay are mapped adjacent to the site on the northwest and east. Freeze and Cherry (1979) describe kame and esker deposits as coarse, water sorted glacial materials that can have very high hydraulic conductivities, generally ranging from 2.8 to 2835 feet per day (ft/day). A range of hydraulic conductivity (k) was chosen for this analysis. A reasonable value of k would result in a flow (Q) that is not more than the average pumping rate during the test. Table 7 indicates that a k of 146.4 feet per day produces a Q that matches the average pumping rate. All of the water clearly did not come from the surficial aquifer, since bedrock water levels were also drawn down; consequently, the actual contribution from the surficial aquifer was less than 300 gpm and the average k of the surficial aquifer is less than 146.4 ft/day. It is Alpha's opinion that a reasonable k for the surficial aquifer is on the order of tens of feet per day, and that the contribution to the pumping discharge was likely more than 150 gpm, or at least half the average pumping rate.

The drawdown in the bedrock well (27 feet) during the test was subdued by the large influx of water to the well from the surficial aquifer via shallow fractures near the top of bedrock. The sand and gravel aquifer will be dewatered locally as the quarry expands. The hydraulic conductivity within the bedrock rock mass of the Lockport Formation is much less than the glacially deposited sand and gravel. The yield supplied from the surficial aquifer will decrease as it is dewatered and mined out; consequently, the drawdown gradients within the bedrock aquifer will increase, compared with the pumping test drawdown. The hydrogeologic evaluation (Alpha 2018) indicated approximately 40 to

50 feet of drawdown at the quarry edge. This will result in a steeper ground water gradient near the edge of the quarry than was seen near pumping well PW-1 during this pumping test.

5.0 CONCLUSIONS

The objective of the pumping test was to provide an onsite assessment of hydrogeologic conditions, verify drawdown with distance, and evaluate the potential impact on the wetland to the southeast. The following are the key conclusions from the pumping test.

5.1 Hydrogeologic Conditions

- The results of the pumping test indicate that most of the water discharged during the test was from the surficial aquifer.
- The fact that the water levels in surficial wells MW-1S and MW-5S were declining at a steady rate at the end of the test is an indication that the water in the sand and gravel deposits can be drained during quarry development.
- The fact that the kame and esker deposits are limited, and terminate laterally against lacustrine silt and clay deposits, indicates that the lateral extent of saturated conditions within the deposits is also limited.
- The inflow to the quarry from the sand and gravel deposits will drop significantly as the aquifer above the mine footprint is drained and removed.
- The connection of the surficial aquifer to the underlying bedrock is through fractures in the surface of the bedrock that are more prevalent in the top few feet of the rock.
- As the sand and gravel is dewatered, the impact will extend outward and the inflow rate to the quarry from the surficial aquifer will drop significantly.
- Drawdown in the bedrock aquifer adjacent to the quarry will be greater than the drawdown observed in the pumping test because the influx of water from the surficial aquifer will diminish.

5.2 Drawdown with Distance

- Most of the drawdown impacts (greater than 1 foot) within the surficial aquifer were observed within 500 feet of the pumping well.
- Most of the bedrock aquifer drawdown impact (greater than 5 feet) was within 600 feet of the pumping well in the northwest-southeast direction and within 1300 feet in the northeast-southwest direction from the pumping well.
- If the asymmetric nature of the bedrock drawdown indicated by the pumping test holds true for the quarry at full expansion, the residential wells along the northern portion of Pine Hill

Rd would experience less drawdown impact than wells along the southern portion of the road.

- The drawdown gradients within the bedrock aquifer next to the quarry will be steeper than the gradients observed during the pumping test because the hydraulic conductivity within the bedrock mass of the Lockport Formation is much less than the surficial sand and gravel aquifer

5.3 Potential Impact to the Wetland to the Southeast

- The water level in the southeastern wetland during the pumping test had dropped 0.14 feet and appeared to stabilize during the last two hours of the test.
- The wetland receives its recharge from direct precipitation and runoff from surrounding upland areas. None of these sources of recharge to the wetland will be removed by the mining.
- The water that recharges the wetland gradually flows to the south to an unnamed drainage channel that drains out of the wetland to the west.
- If the extent of ground water drawdown impacts during quarry development reaches the northern edge of the southeastern wetland, it will result in some backflow to the north and a slight reduction in the flow to the unnamed drainage channel.

5.4 Potential Impact to the Wetland to the East

- The wetland between the SG-1 pond and Eagle Harbor Rd was not impacted during the pumping test.
- The wetland will not be impacted by dewatering at the quarry in the future because the SG-1 pond will continue to be replenished with quarry discharge water in order to supply the wash plant. This SG-1 pond replenishment will recharge the water table and maintain an eastward limit to the extent of drawdown within the surficial aquifer.

6.0 REFERENCES

Alpha Geoscience; December, 2018; Hydrogeologic Evaluation of the Proposed Eagle Harbor Aggregate Mine; consulting report for Eagle Harbor Sand & Gravel; 16 p.

Bradford, A.H., P.S. Puglia, and T.D. Yoakum; 1977; Soil Survey of Orleans County, New York; USDA, Soil Conservation Service, in cooperation with Cornell University Agricultural Experiment Station; 140 p.

Cadwell, D.H.; 1988; Surficial Geologic Map of New York – Niagara Sheet; New York State Museum, Map and Chart Series 40; 1:250,000.

Freeze, R.A., and Cherry, J.A., 1979, Groundwater; Prentice Hall, Englewood Cliffs, NJ; 604 p.

Tepper, D.H., et al., 1990, Stratigraphy, Structure, and Hydrogeology of the Lockport Group; Niagara Falls Area, New York; New York State Geological Association; 62nd Annual Meeting of the New York State Geological Association, Fredonia, NY, Guidebook No. 62.

Z:\projects\2015\15121 - 15140\15139 - Eagle Harbor\5_0 Reports\Pumping Test Report\Pumping Test Evaluation.docx

TABLES

TABLE 1
Summary of Well Construction Data
PW-1A Pumping Test
Eagle Harbor Mine

	Well ID	Measuring Point for (MP) Water Levels	MP Elevation (ft amsl)	Well Stickup (ft)	Overburden thickness (ft)	Elevation of Top of Bedock (ft amsl)	Depth to Top of Rochester Shale Below Grade (ft)	Screened Interval (ft)	Total Depth Below Grade (ft)
Bedrock Aquifer	MW-1	TOC[1]	679.33	0.85	35.9	642.58	94.2	open corehole	115.9
	MW-2	TOC	687.44 [2]	10.83	26.8	649.81	86.3	open corehole	108
	MW-3	TOC	670.25	2.46	34.5	633.29	70	open corehole	80.5
	MW-4	TOC	709.67	2.23	59.7	647.74	124.6	open corehole	128.4
	PW-1	TOC	676.2	1.6	28	646.6	unknown	bedrock 28-33	95
	PW-1A	TOC	677 [5]	1.8	28	647.2	unknown	bedrock 38-86	86
	Parsons	TOC	668	1.5	unknown	unknown	unknown	bedrock	unknown
	Miller	TOC	699.01	1	unknown	637.5(est.)	unknown	open borehole	70
	Barn	Top of Concrete	714.42	0	unknown	657.8 (est)	unknown	open borehole	66.1
Surficial Aquifer	MW-1S	TOC	679.41	1.02	>11.94	<667.47	Not Encountered	9.44-11.94	11.94
	MW-2S	TOC	681.57	3.21	>12	<666.36	Not Encountered	~9.5-12	12
	MW-3S	TOC	670.29	2.44	>18	<649.85	Not Encountered	8-18	18
	MW-4S	TOC	709.98	2.46	>40.3	<667.22	Not Encountered	28.5-38.5	40.3
	MW-5S	TOC	677.9	2.96	>25	<649.94	Not Encountered	5-25	25
	USGS OI-20	Grade	695	NM	>54.2	<640.8	Not Encountered	39.1-48.9	54.2
Surface Water	SG-1	top of post	668	NA[4]	NA	NA	NA	NA	NA
	PG-1	top of stake	672.2	NA	NA	NA	NA	NA	NA
	WP-1	top of pipe	672.5	NA	NA	NA	NA	NA	NA
	Kam's Rd	top of culvert	not measured	NA	NA	NA	NA	NA	NA
	Maple St	top of culvert (Lower Lip)	661.34	NA	NA	NA	NA	NA	NA

Notes:
1. TOC = Top of Casing
2. Top of Casing elevation is currently 10.83 ft higher than grade at time of well installation; a 10.83-ft casing extension was added to top of well so that it would not be buried by reclamation fill; grade elevation at time of MW-2 installation was approximately 676.61 ft
3. Top of Barn well casing is in a vault below ground; measurements are made from the top of the concrete slab vault cover, just above grade.
4. NA = Not applicable; surface water monitoring location
5. Measuring point for water levels during February 2020 pumping test was top of stilling tube at elevation 677.8

TABLE 2
Flow Measurements
PW-1A Pumping Test
Eagle Harbor Mine

Date & Time	PW-1A Discharge	Downstream Ditch	Maple St. Culvert	Measurement Method
2/3/2020 17:17			63.6	direct, 5-gal bucket
2/3/2020 18:16	326			direct, 55-gal drum
2/4/2020 8:15			195	direct, 5-gal bucket
2/4/2020 13:10	301			direct, 55-gal drum
2/4/2020 13:18			273	direct, 5-gal bucket
2/4/2020 15:30	294			direct, 55-gal drum
2/4/2020 16:30		325		flow meter, cross-sectional area
2/5/2020 9:30			306	direct, 5-gal bucket
2/5/2020 12:34	311			direct, 55-gal drum
2/5/2020 15:30			368	flow meter, calculated
2/6/2020 10:55			358	flow meter, calculated
2/6/2020 15:34		334		flow meter, cross-sectional area

Note: all measurements in gallons per minute

TABLE 3
Water Level Summary
PW-1A Pumping Test
Eagle Harbor Mine

	Well ID	Measuring Point Elevation (ft amsl)	Pre-Test Static Water Level: Depth to Water (ft)	Pre-Test Static Water Level: Ground Water Elevation	End-of-Test Water Level: Depth to Water (ft)	End-of-Test Water Level: Ground Water Elevation	Drawdown (ft)
Bedrock Aquifer	PW-1	676.20	5.84	670.36	32.16	644.04	26.32
	PW-1A	677.80	7.98	669.82	35.02	642.78	27.04
	MW-1	679.33	10.09	669.24	18.58	660.75	8.49
	MW-2	687.44	22.33	665.11	23.15	664.29	0.82
	MW-3	670.25	10.00	660.25	10.24	660.01	0.24
	MW-4	709.67	42.50	667.17	52.81	656.86	10.31
	PARSONS	669.5	10.90	658.60	11.01	658.49	0.11
	BARN	710.18	45.70	664.48	46.32	663.86	0.62
	MILLER	699.01	36.94	662.07	36.86	662.15	-0.08
Surficial Aquifer	MW-1S	679.41	4.49	674.92	5.80	673.61	1.31
	MW-2S	681.57	14.17	667.40	14.15	667.42	-0.02
	MW-3S	670.29	8.60	661.69	8.60	661.69	0.00
	MW-4S	709.98	32.05	677.93	31.80	678.18	-0.25
	MW-5S	677.77	6.96	670.81	8.28	669.49	1.32
	USGS OL-20	695.00	19.52	675.48	19.54	675.46	0.02
Surface Water	SG-1	668.00	0.75	667.25	0.75	667.25	0.00
	PG-1	672.20	0.58	671.62	0.85	671.35	0.27
	WP-1	672.50	2.27	670.23	2.41	670.09	0.14
	MAPLE	661.34	0.77	660.57	0.47	660.87	-0.3
	KAMS	NM	1.30	NM	1.09	NM	-0.21

TABLE 4
PW-1A Water Levels
PW-1A Pumping Test
Eagle Harbor Mine

Date and Time	Elapsed Time (minutes)	Water Level (ft below MP)	Drawdown (ft)	Water Level Elevation (ft amsl)	Remarks
2/3/20 17:46		7.98		669.82	Static water level
2/3/20 17:47	0	7.98	0	669.82	Pump on
2/3/20 17:49:30	2.5	34.7	26.72	643.1	
2/3/20 17:51	4	38.4	30.42	639.4	
2/3/20 17:52	5	39.3	31.32	638.5	
2/3/20 17:54	7	38.7	30.72	639.1	
2/3/20 17:58	11	36.8	28.82	641	
2/3/20 18:03	16	35.98	28	641.82	
2/3/20 18:06	19	34.85	26.87	642.95	
2/3/20 18:27	40	35.75	27.77	642.05	
2/3/20 18:58	71	34.82	26.84	642.98	
2/3/20 19:00	73	34.24	26.26	643.56	
2/3/20 20:06	139	32.97	24.99	644.83	
2/3/20 21:06	199	32.83	24.85	644.97	
2/3/20 22:00	253	32.94	24.96	644.86	
2/3/20 22:30	283	33.05	25.07	644.75	
2/3/20 23:25	338	32.86	24.88	644.94	
2/4/20 0:30	403	32.81	24.83	644.99	
2/4/20 1:15	448	33.16	25.18	644.64	
2/4/20 2:00	493	32.97	24.99	644.83	
2/4/20 6:00	733	33.39	25.41	644.41	
2/4/20 9:00	913	37.95	29.97	639.85	
2/4/20 10:08	981	36.41	28.43	641.39	
2/4/20 11:59	1092	35.28	27.3	642.52	
2/4/20 13:57	1210	35.31	27.33	642.49	
2/4/20 16:09	1342	34.6	26.62	643.2	
2/4/20 17:57	1450	36.05	28.07	641.75	
2/4/20 20:00	1573	35.48	27.5	642.32	
2/4/20 22:00	1693	35.26	27.28	642.54	
2/4/20 23:30	1783	35.9	27.92	641.9	
2/5/20 1:45	1918	35.98	28	641.82	
2/5/20 5:30	2143	35.38	27.4	642.42	
2/5/20 11:13	2486	36.31	28.33	641.49	
2/5/20 14:27	2680	35.8	27.82	642	
2/5/20 16:55	2828	34.19	26.21	643.61	
2/5/20 18:51	2944	34.78	26.8	643.02	
2/5/20 22:00	3133	35.35	27.37	642.45	
2/6/20 2:00	3373	34.89	26.91	642.91	
2/6/20 6:00	3613	35.17	27.19	642.63	
2/6/20 9:27	3820	34.6	26.62	643.2	
2/6/20 13:37	4070	34.75	26.77	643.05	
2/6/20 17:37	4310	35.05	27.07	642.75	
2/6/20 17:46	4319	35.02	27.04	642.78	Pump Off; Begin Recovery
2/6/20 17:47	4320	20.09	12.11	657.71	
2/6/20 17:48	4321	16.95	8.97	660.85	
2/6/20 17:49	4322	15.23	7.25	662.57	
2/6/20 17:50	4323	14.47	6.49	663.33	
2/6/20 17:51	4324	13.9	5.92	663.9	
2/6/20 17:52	4325	13.39	5.41	664.41	

2/6/20 17:53	4326	12.96	4.98	664.84	
2/6/20 17:54	4327	12.6	4.62	665.2	
2/6/20 17:55	4328	12.34	4.36	665.46	
2/6/20 17:56	4329	12.08	4.1	665.72	
2/6/20 18:06	4339	10.89	2.91	666.91	
2/6/20 18:16	4349	10.3	2.32	667.5	
2/6/20 18:26	4359	9.91	1.93	667.89	
2/6/20 18:36	4369	9.64	1.66	668.16	
2/6/20 18:46	4379	9.43	1.45	668.37	
2/6/20 19:46	4439	9	1.02	668.8	
2/6/20 21:10	4523	8.75	0.77	669.05	
2/7/20 18:57	5830	8.48	0.5	669.32	
2/18/20 12:00	21253	8.17	0.19	669.63	

Notes:
MP = Measuring Point = Stilling Tube, 0.8 ft above steel casing
GPM = gallons per minute

TABLE 5
Field Water Quality Results
PW-1A Pumping Test
Eagle Harbor Mine

PW-1A					
Date	Time	Temperature (°C)	Specific Conductivity (mS)	TDS (ppm)	pH
2/3/2020	23:36	12.1	617	308	7.5
2/4/2020	2:50	11.3	616	308	7.5
2/4/2020	6:54	11.5	618	309	7.5
2/4/2020	10:15	10.6	595	297	7.5
2/4/2020	16:14	10.6	598	300	7.5
2/4/2020	19:45	10.8	591	296	7.6
2/4/2020	22:44	9.2	592	296	7.6
2/5/2020	2:26	10.1	591	295	7.5
2/5/2020	6:08	11	610	305	7.5
2/5/2020	11:24	10.2	608	304	7.5
2/5/2020	14:30	10.1	599	300	7.5
2/5/2020	18:45	10	602	301	7.5
2/5/2020	22:33	9.8	612	306	7.5
2/6/2020	3:30	9.5	600	300	7.5
2/6/2020	6:50	10	607	304	7.6
2/6/2020	10:10	10.8	600	300	7.6
2/6/2020	14:00	10.5	599	298	7.6

Maple Street Culvert					
Date	Time	Temperature (°C)	Specific Conductivity (mS)	TDS (ppm)	pH
2/3/2020	17:30	3.4	497	247	8.4
2/4/2020	8:05	2.6	494	243	7.6
2/4/2020	11:36	2.1	501	250	7.7
2/4/2020	15:18	2.1	500	253	7.5
2/5/2020	17:28	0.9	512	255	7.8
2/5/2020	12:05	1.3	527	263	7.8
2/5/2020	15:17	1.7	533	266	7.7
2/5/2020	17:47	1.4	521	276	7.7
2/6/2020	7:54	0.8	554	277	7.9
2/6/2020	10:50	1.2	545	273	7.9
2/6/2020	14:32	1.4	549	275	7.9

TABLE 6
Weather Data
NOAA Station ID 300055 - Albion, NY
PW-1A Pumping Test
Eagle Harbor Mine

Date	ALBION, NY Station: Maximum Temperature (°F)	Minimum Temperature (°F)	Precipitation (in)*	Snowfall (in)	
1/15/2020	46	23	0	0	
1/16/2020	39	26	0.08	0	
1/17/2020	39	8	0	0	
1/18/2020	37	8	0.37	2.5	
1/19/2020	42	14	0.1	1	
1/20/2020	19	-1	0	0	
1/21/2020	29	4	T	T	
1/22/2020	33	20	0	0	
1/23/2020	45	17	0	0	
1/24/2020	47	30	0	0	
1/25/2020	47	34	S	0	
1/26/2020	38	33	0.74A	0	
1/27/2020	36	33	0.16	0	
1/28/2020	34	31	0.11	0	
1/29/2020	32	20	0	0	
1/30/2020	28	14	0	0	
1/31/2020	32	17	0	0	
2/1/2020	29	18	0	0	
2/2/2020	35	17	0.2	T	
2/3/2020	45	31	0.01	0	Pumping Test
2/4/2020	38	30	0	0	
2/5/2020	35	22	0	0	
2/6/2020	31	21	0.23	2	
2/7/2020	26	21	0.35	2.3	
2/8/2020	26	-2	0.03	2.5	
2/9/2020	39	-2	0	0	
2/10/2020	41	33	0.1	0	
2/11/2020	41	30	0	0	
2/12/2020	38	22	0	0	
2/13/2020	38	24	0.16	1.5	
2/14/2020	38	-2	0.03	1.3	
2/15/2020	38	-2	0.01	0	

* Precipitation: Rain and liquified equivalent of snowfall.

T: Trace amount- Less than 0.01" precipitation; less than 0.1" snowfall; less than 1" snow depth.

S: Subsequent- Indicates the observation is missing, but is included in a subsequent value.

A: Accumulated- Indicates an accumulated value which includes the current day and any immediately preceeding missing days (starting with a day flagged by "S").

M: Indicates missing data.

TABLE 7

Calculations for Q = kiA
PW-1A Pumping Test
Eagle Harbor Mine

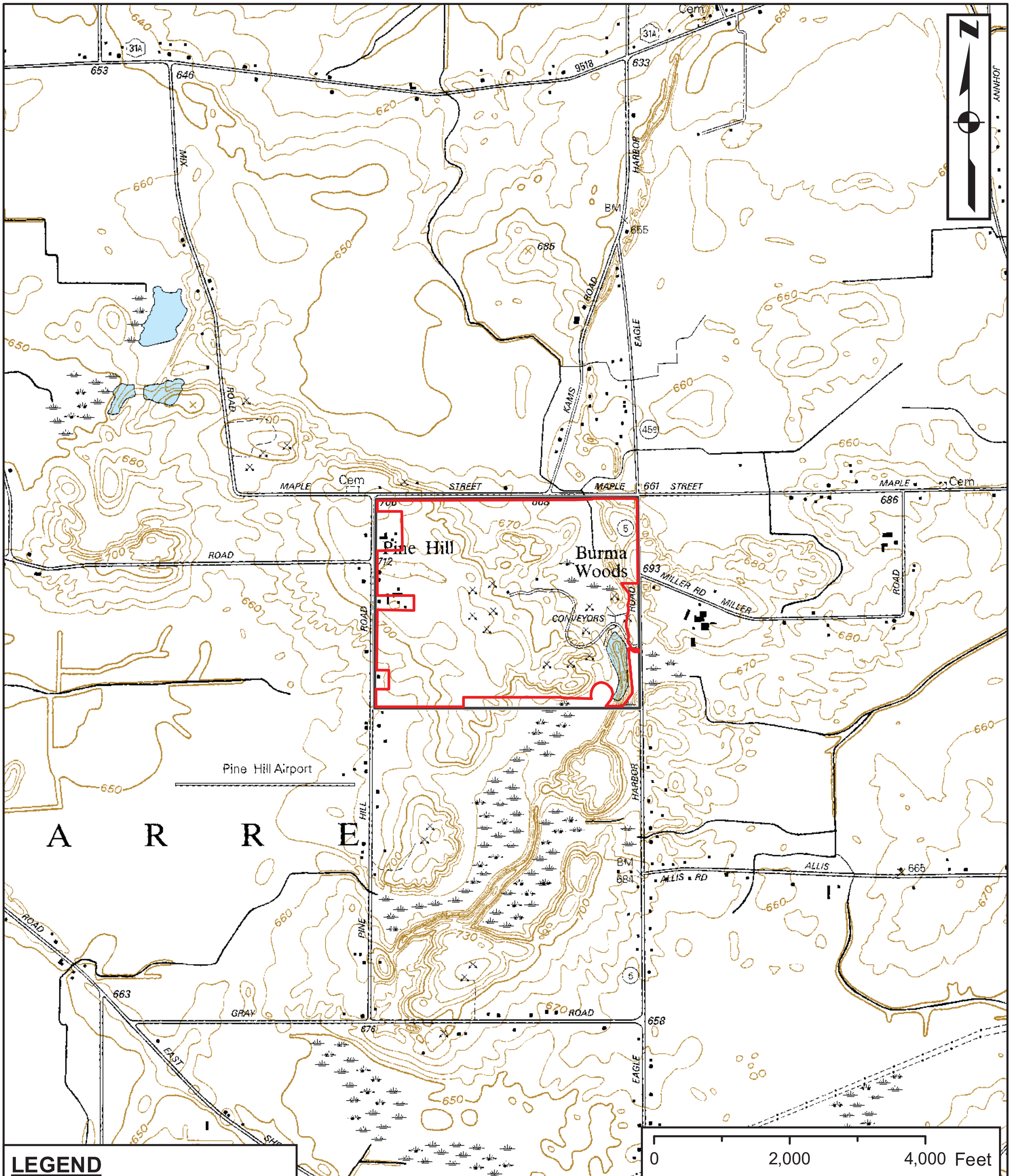
Refer to Figure 5

	Hydraulic Gradient (*i*)			Area (A)						Discharge (Q = k*iA*) in gpm if:				
Flow Line	Change in Water Level (d)	Length (l)	*i* = d/l	Water Table Elev (WT)	Top of Bedrock Elevation (TOR)	Saturated Thickness (h = WT-TOR)	Representative Length, Midpoint to Midpoint (L)		Cross-Sectional Area (A = L x h)	k = 2.8 ft/day	k = 28 ft/day	k = 146.4 ft/day	k = 280 ft/day	k = 2800 ft/day
A	3	159.69	0.019	670.95	646.55	24.4	269.82	EA to AB	6583.6	1.7989	17.9889	94.0563	179.8890	1798.8901
B	3	220.1	0.014	670.7	643.6	27.1	311.26	AB to BC	8435.1	1.6722	16.7221	87.4327	167.2211	1672.2105
C	1	215.28	0.005	669.55	642.4	27.15	340.44	BC to CD	9242.9	0.6245	6.2446	32.6503	62.4459	624.4589
D	0.49	201.6	0.002	669.6	645.3	24.3	319	CD to DE	7751.7	0.2740	2.7403	14.3279	27.4031	274.0310
E	3	240.48	0.012	670.3	648.3	22	342.77	DE to EA	7540.9	1.3682	13.6825	71.5398	136.8248	1368.2483
									Total Discharge (gpm) from Surficial Aquifer =	5.7	57.4	300.0	573.8	5737.8

All measurements in feet, except where indicated
WT = average water table elevation between midpoints (see Figure 5)
TOR = average bedrock elevation between midpoints (see Figure 5)

Total gallons pumped during test, assuming average pumping rate of 300 gpm = 1,296,000 gal

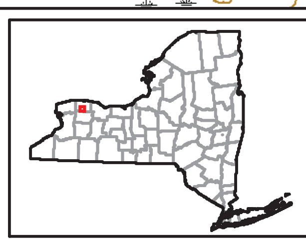
FIGURES



LEGEND

Property Boundary

Life of Mine Boundary



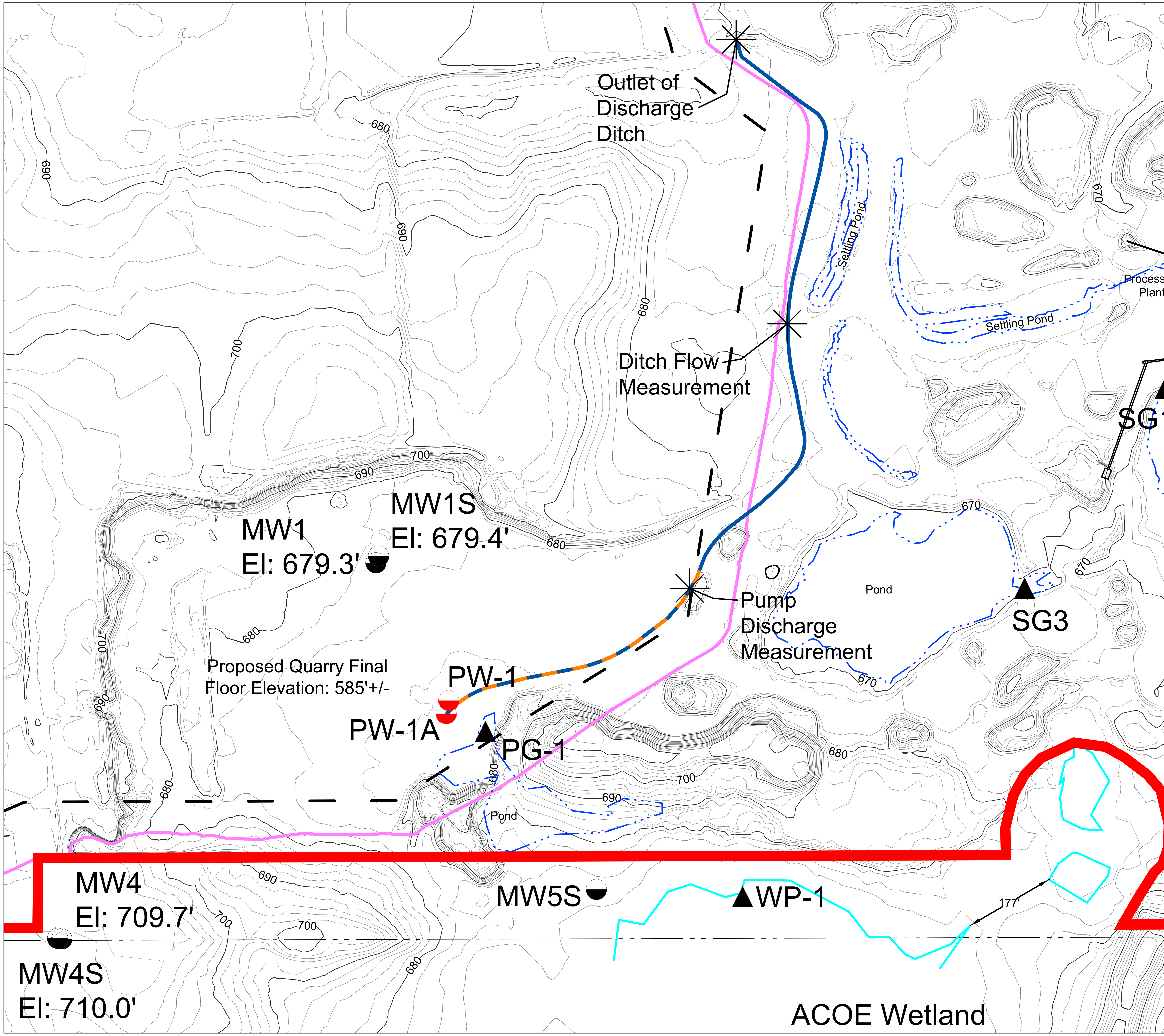
Source:
-NYSDOT 7.5-minute topographic map (Kowlesville and Albion quadrangles).
-Elevations are shown in feet above mean sea level.
-Contour interval is 10 feet.

ALPHA GEOSCIENCE
Proj. No. 18109

FIGURE 1
Site Location Map

Eagle Harbor Sand & Gravel Mine
Town of Barre
Orleans County, New York

Path: Z:\projects\2015\15121 - 15140\15139 - Eagle Harbor\15_0 GIS\Fig 1 - Site_Location_Map_LTR.mxd
Date Saved: 11/2/2018 11:20:39 AM



LEGEND

	Property Line
	Life of Mine Boundary
700	10' Contour Line
	2' Contour Line
	Stream/Edge of Water
	Limit of Future Bedrock Excavation
	Top of Future Graded Stripping Slope
	Ditch for Pumping Well Discharge
	Pumping Well Discharge Hose
	Delineated Federal Wetland Boundary
▲	Staff Gauge
	Monitoring Well
	Pumping Well
	Residential Well
	Well Point

SCALE

200 0 200 400 600

NOTES

Base Maps & Background Information

1. Base Map provided by Strategic Mining Solutions, Mining and Reclamation Plan Map
2. Shallow water table monitoring wells are denoted with an "S" e.g. "MW-1S"

DETAILS

Topographic Survey Date: June 5, 2018
Horizontal Scale: 1" = 500'
Datum: Mean Sea Level
USGS Quad:
Contour Interval: 2 feet

ALPHA GEOSCIENCE
Project #15139

FIGURE 2
EAGLE HARBOR PUMPING TEST
Monitoring Locations
Near Pumping Well

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.
Town of Barre, Orleans County, New York

Z:\projects\2015\15121-15140\15139 - Eagle Harbor\15_0 GIS\Data\CAD\Figure 2 Site Map - Zoom In 11x17.dwg

FIGURE 3
Distance-Drawdown
Northeast and Southwest from PW-1A
PW-1A Pumping Test

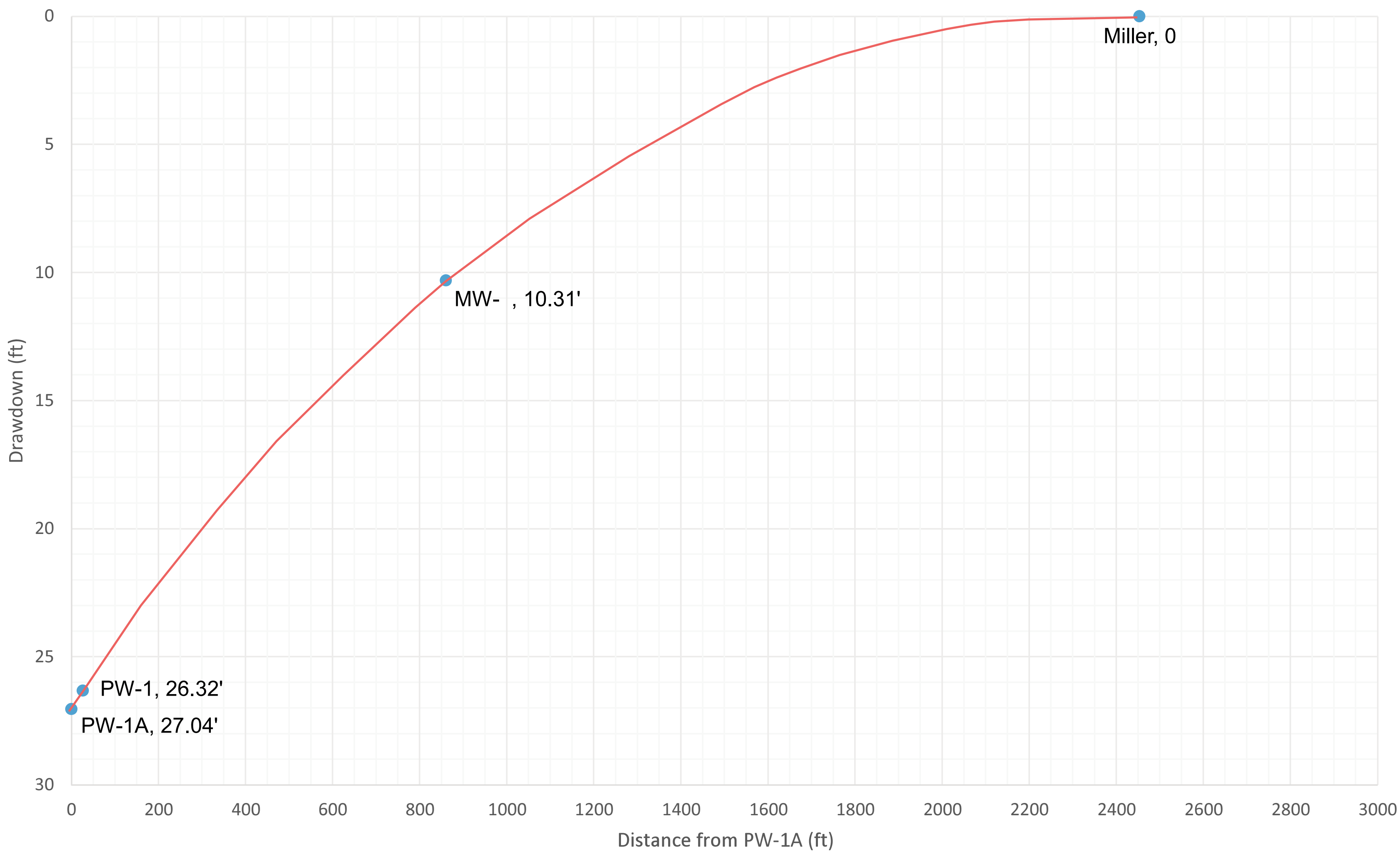
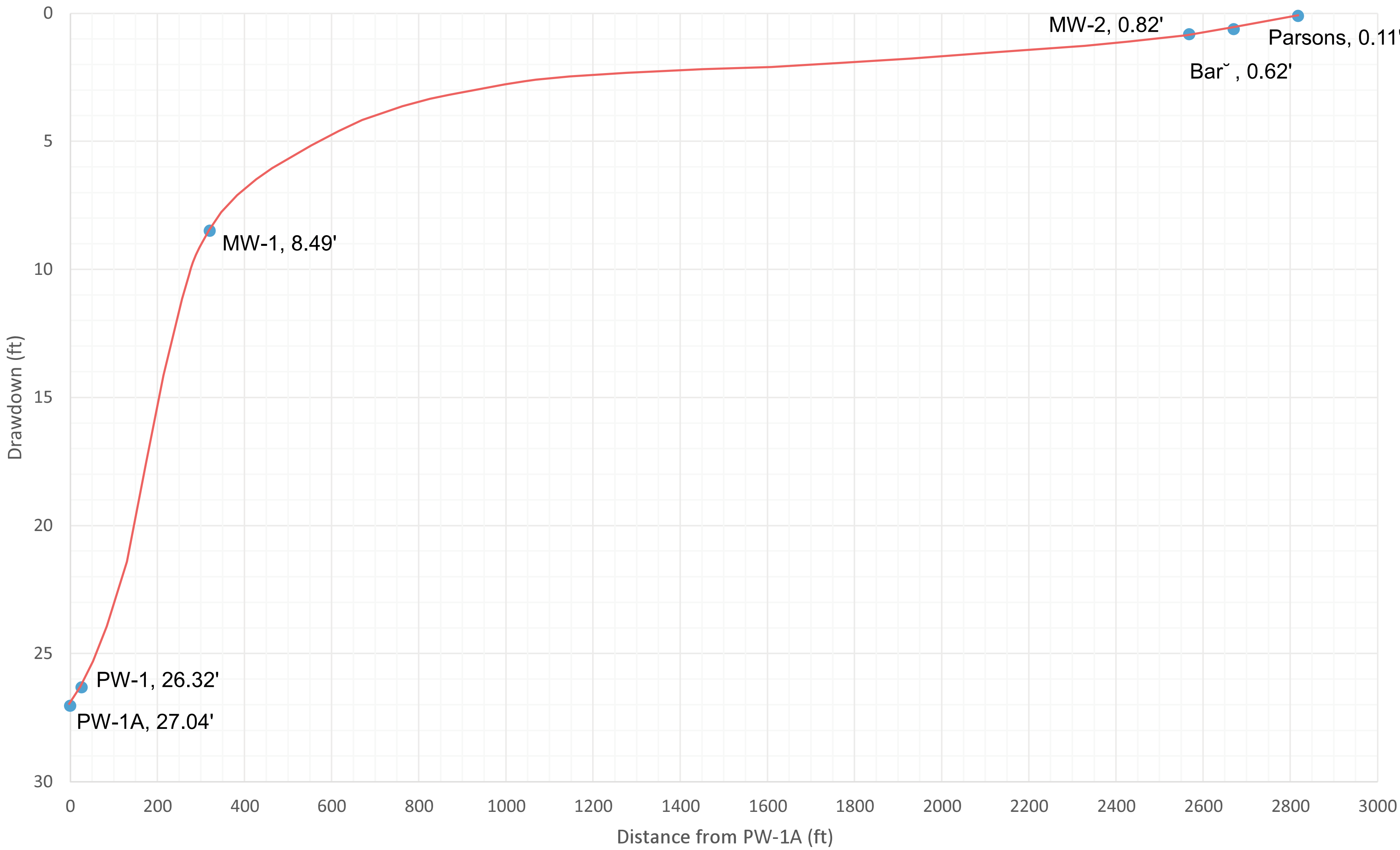
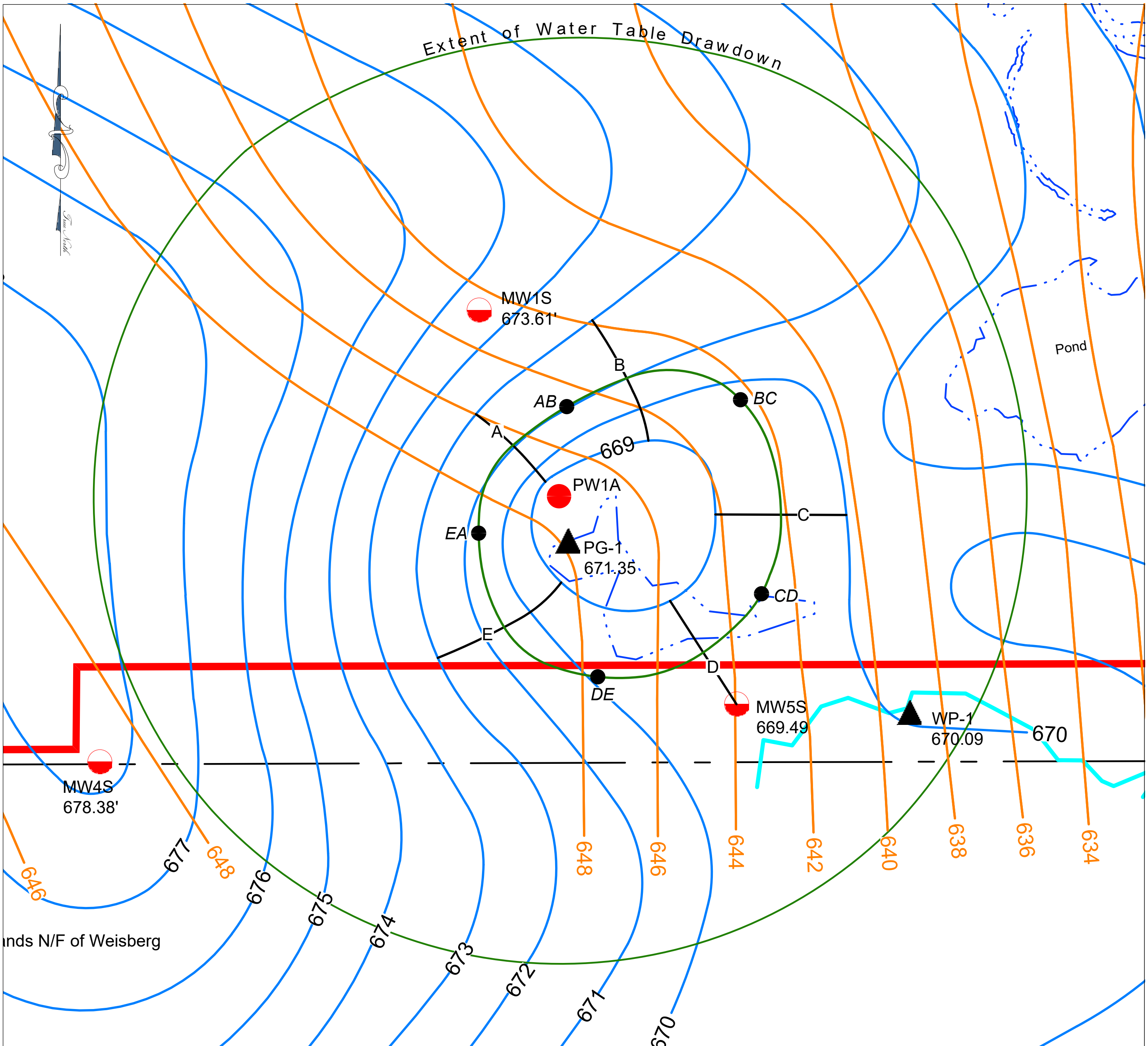


FIGURE 4
Distance-Drawdown
Northwest and Southeast from PW-1A
PW-1A Pumping Test





LEGEND

	Property Line
	Life of Mine Boundary
	Stream/Edge of Water
	ACOE Delineated Wetland Boundary
680	Top of Bedrock Elevation Contour (ft AMSL)
668	Water Table Elevation Contour, with elevation (ft AMSL)
CD	Midpoint Between Hydraulic Gradient Lines
C	Hydraulic Gradient Line
BC CD	Cross-sectional Area Line Between Midpoints
PW-1A	Pumping Well
MW-4S 677.93	Shallow Monitoring Well, with ID and ground water elevation (ft AMSL)
SG-1 667.25	Staff Gauge, with ID and ground water elevation (ft AMSL)

SCALE

250 0 250

ALPHA GEOSCIENCE
Project # 15139

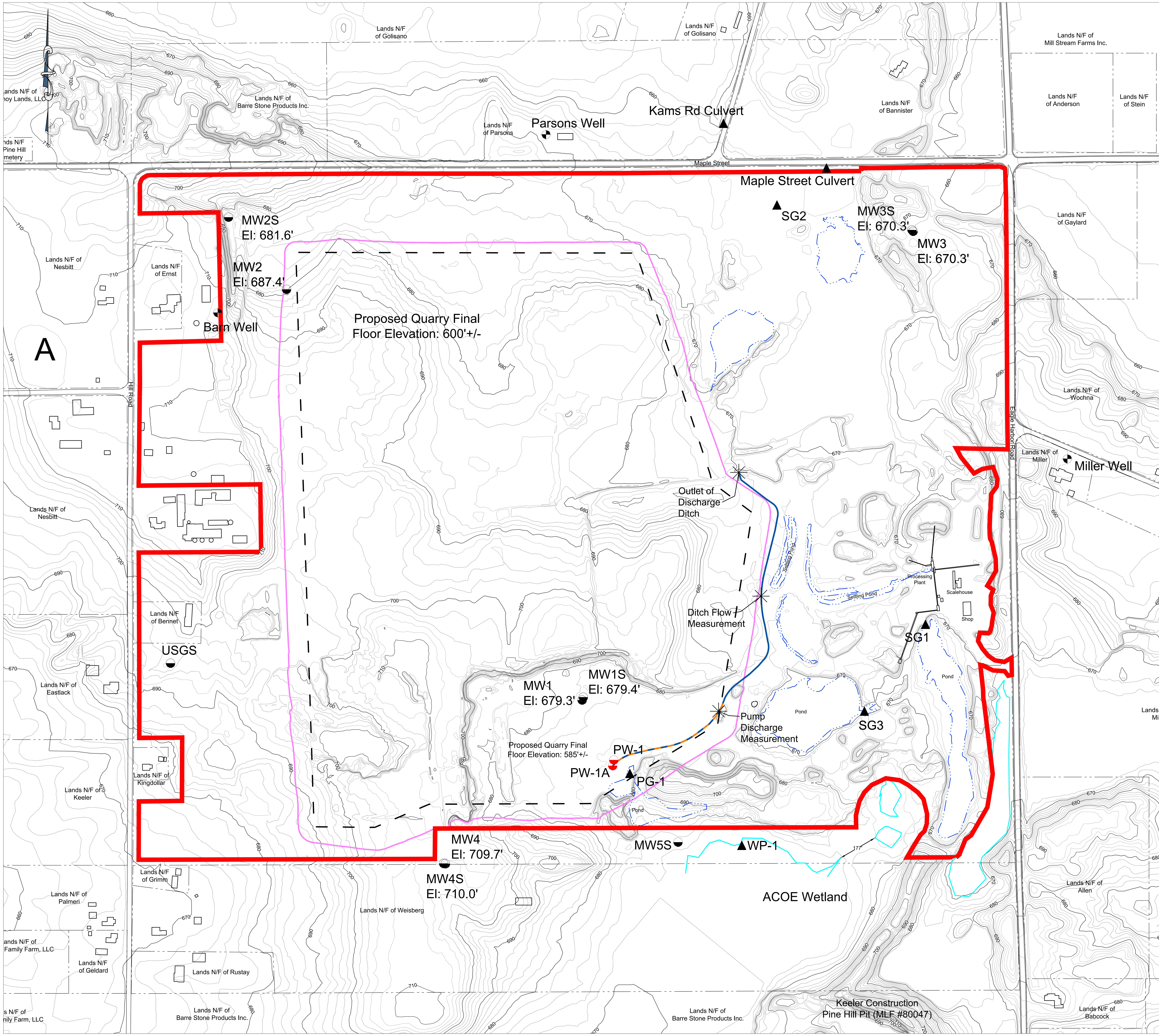
FIGURE 5

REFERENCE MAP FOR HYDRAULIC GRADIENT AND CROSS-SECTIONAL AREA CALCULATIONS

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.

Town of Barre, Orleans County, New York

PLATES



Z:\projects\2015\15121-15140\15139 - Eagle Harbor\15_0 GIS\Data\CAD\Plate 1 Site Map.dwg

LEGEND

- Property Line
- Life of Mine Boundary
- 10' Contour Line
- 2' Contour Line
- Stream/Edge of Water
- Structure
- Paved Road
- Proposed Limit of Bedrock Excavation
- Proposed Top of Stripping Slope
- Delineated Wetland Boundary
- Ditch for Pumping Well Discharge Pipe/Hose
- Pumping Well Discharge Pipe/Hose
- Staff Gauge, with ID (SG-1)
- Monitoring Well, with ID and grade (ft AMSL) (MW-4 El: 709.7)
- Residential Well, with ID (Miller Well)

SCALE

200 0 200 400 600 800

NOTES

Base Maps & Background Information
1. Base Map provided by Strategic Mining Solutions, Mining and Reclamation Plan Map.
2. Shallow water table monitoring wells are denoted with an "S" e.g. "MW-1S"

DETAILS

Topographic Survey Date: August 17, 2016
Horizontal Scale: 1" = 200'
Datum: Mean Sea Level
USGS Quad:
Contour Interval: 2 feet

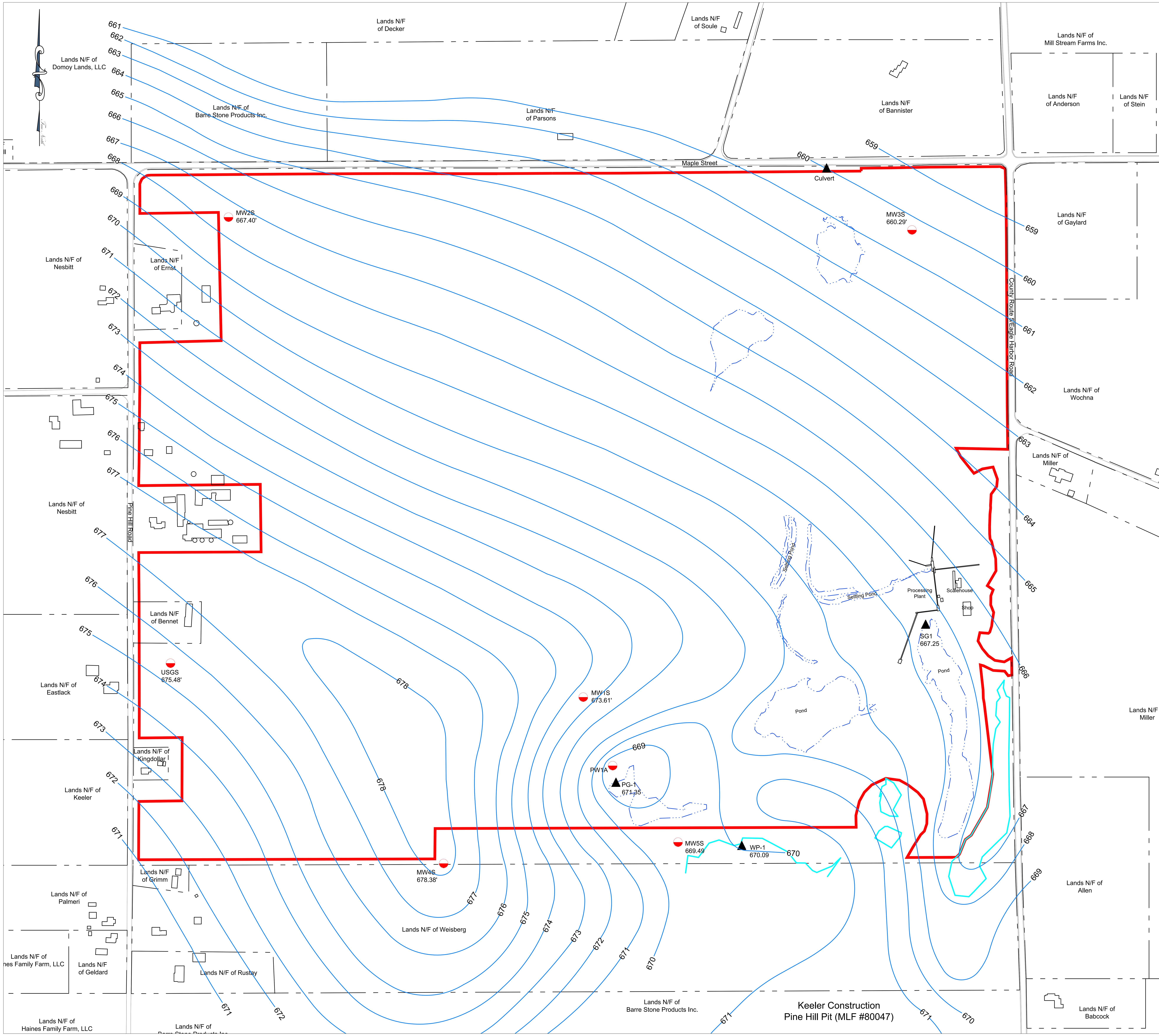
ALPHA GEOSCIENCE
Project # 15139

PLATE 1

SITE MAP WITH
MONITORING LOCATIONS

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.
Town of Barre, Orleans County, New York

Z:\projects\2015\15121-15140\15139 - Eagle Harbor\15_0 GIS\Data\CAD\Water Table Aquifer GW Contours - pretest.dwg



LEGEND

Symbol	Description
	Property Line
	Life of Mine Boundary
	Stream/Edge of Water
	ACOE Delineated Wetland Boundary
	Structure
	Paved Road
668	Ground Water Elevation Contour, with elevation (ft AMSL)
MW-4S 677.93	Shallow Monitoring Well, with ID and ground water elevation (ft AMSL)
SG-1 667.25	Staff Gauge, with ID and ground water elevation (ft AMSL)

SCALE

200 0 200 400 600 800

NOTES

Base Maps & Background Information
1. Base Map provided by Strategic Mining Solutions.

DETAILS

Horizontal Scale: 1" = 200'
Datum: Mean Sea Level
USGS Quad:

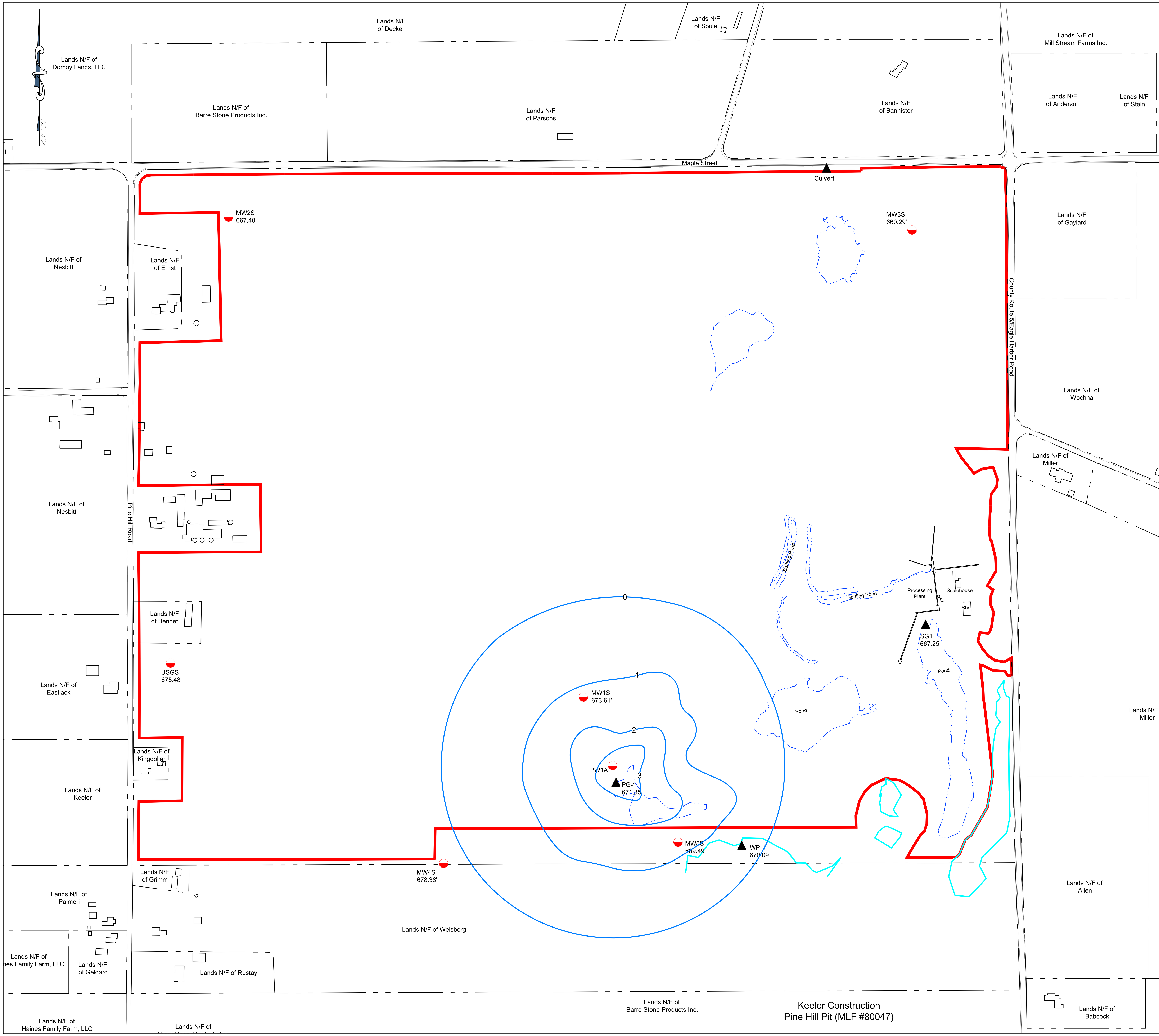
ALPHA GEOSCIENCE
Project # 15139

PLATE 3

WATER TABLE
(END OF TEST)

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.
Town of Barre, Orleans County, New York

Z:\projects\2015\15121-15140\15139 - Eagle Harbor\15_0 GIS\Data\CAD\Water Table Aquifer GW Contours - End of Test.dwg



LEGEND

- Property Line
- Life of Mine Boundary
- Stream/Edge of Water
- ACOE Delineated Wetland Boundary
- Structure
- Paved Road
- Ground Water Drawdown Contour, with drawdown (ft)
- MW-4S 677.93 — Shallow Monitoring Well, with ID and ground water elevation (ft AMSL)
- SG-1 667.25 — Staff Gauge, with ID and ground water elevation (ft AMSL)

SCALE

200 0 200 400 600 800

NOTES

Base Maps & Background Information
1. Base Map provided by Strategic Mining Solutions.

DETAILS

Horizontal Scale: 1" = 200'
Datum: Mean Sea Level
USGS Quad:

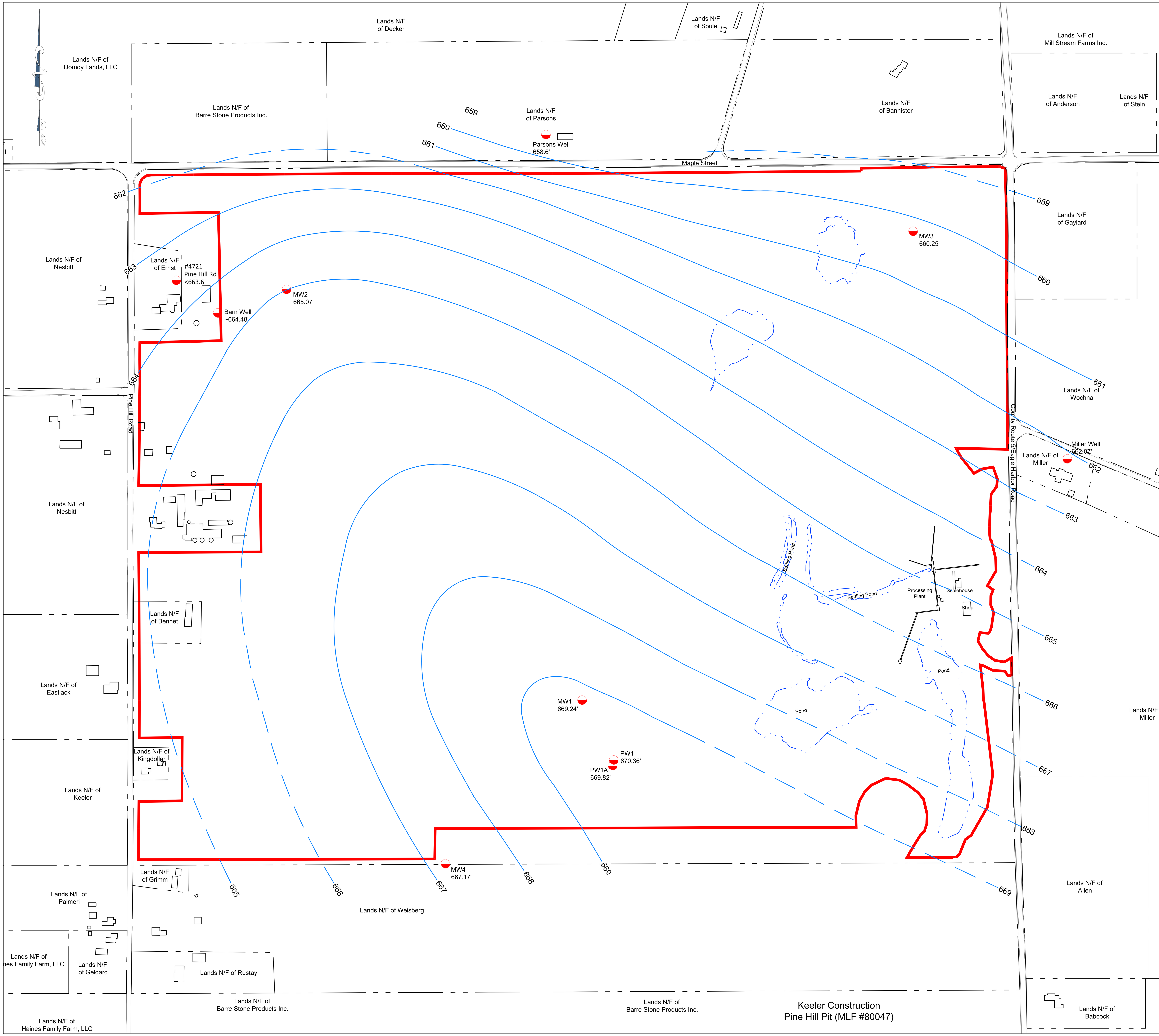
ALPHA GEOSCIENCE
Project # 15139

PLATE 4

WATER TABLE DRAWDOWN

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.
Town of Barre, Orleans County, New York

Z:\projects\2015\15121-15140\15139 - Eagle Harbor\15_0 GIS\Data\CAD\Water Table Drawdown GW Contours.dwg



LEGEND

- Property Line
- Life of Mine Boundary
- Stream/Edge of Water
- Structure
- Paved Road
- Ground Water Elevation Contour, with elevation (ft AMSL) — 668
- Monitoring Well, or Residential Well, with ID and ground water elevation (ft AMSL) — MW-4 667.17

SCALE

200 0 200 400 600 800

NOTES

Base Maps & Background Information
1. Base Map provided by Strategic Mining Solutions.

DETAILS

Horizontal Scale: 1" = 200'
Datum: Mean Sea Level
USGS Quad:

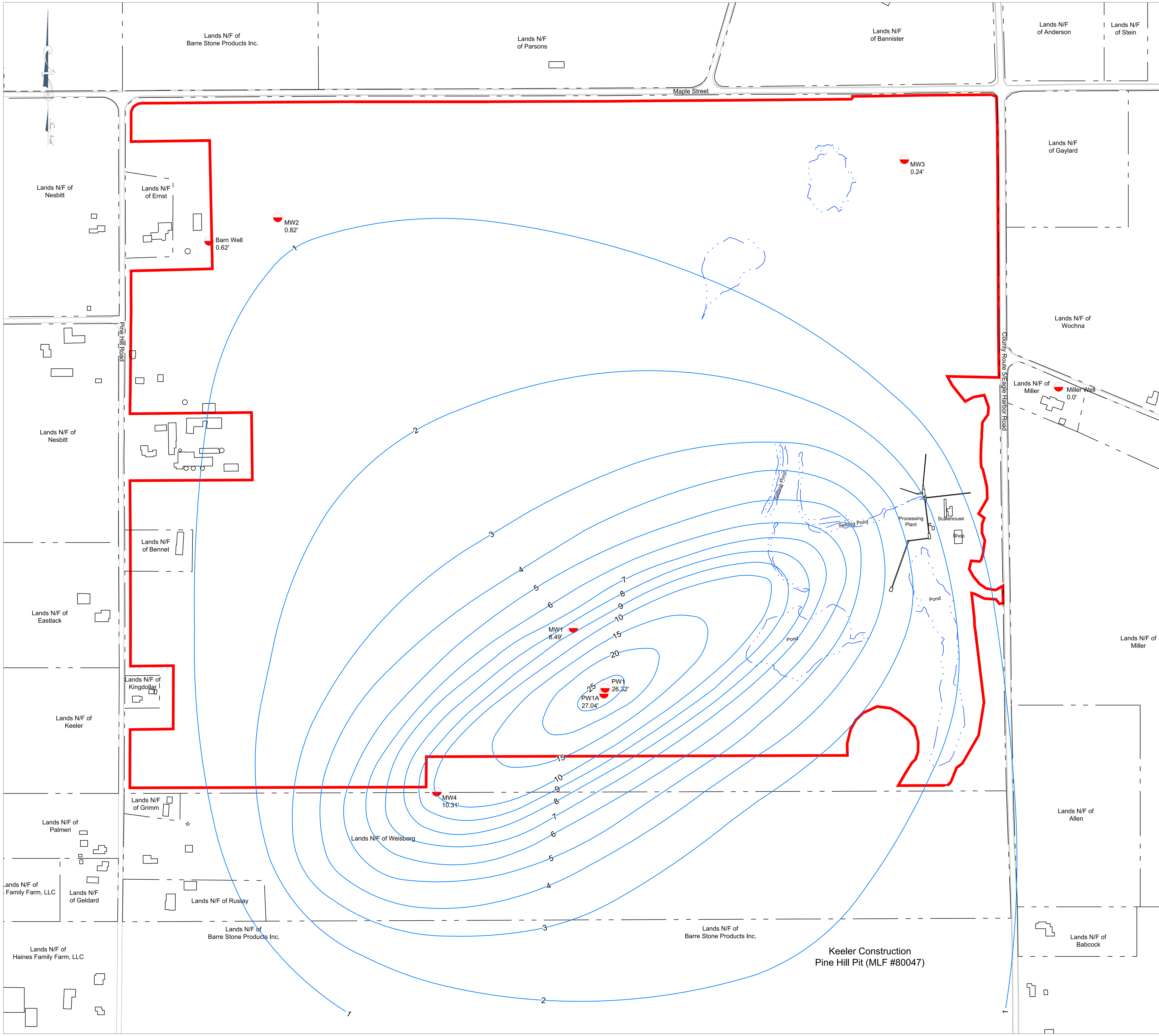
ALPHA GEOSCIENCE
Project # 15139

PLATE 5

BEDROCK
POTENTIOMETRIC SURFACE
(PRE-TEST)

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.
Town of Barre, Orleans County, New York

Z:\projects\2015\15121-15140\15139 - Eagle Harbor\15_0 GIS\Data\CAD\Bedrock Aquifer - Pretest.dwg



LEGEND

- Property Line
- Life of Mine Boundary
- Stream/Edge of Water
- Structure
- Paved Road
- Drawdown Contour (ft)
- Monitoring Well, or Residential Well, with ID and Drawdown (ft)

SCALE

200 0 200 400 600 800

NOTES

Base Maps & Background Information
1. Base Map provided by Strategic Mining Solutions.

DETAILS

Horizontal Scale: 1" = 200'
Datum: Mean Sea Level
USGS Quad:

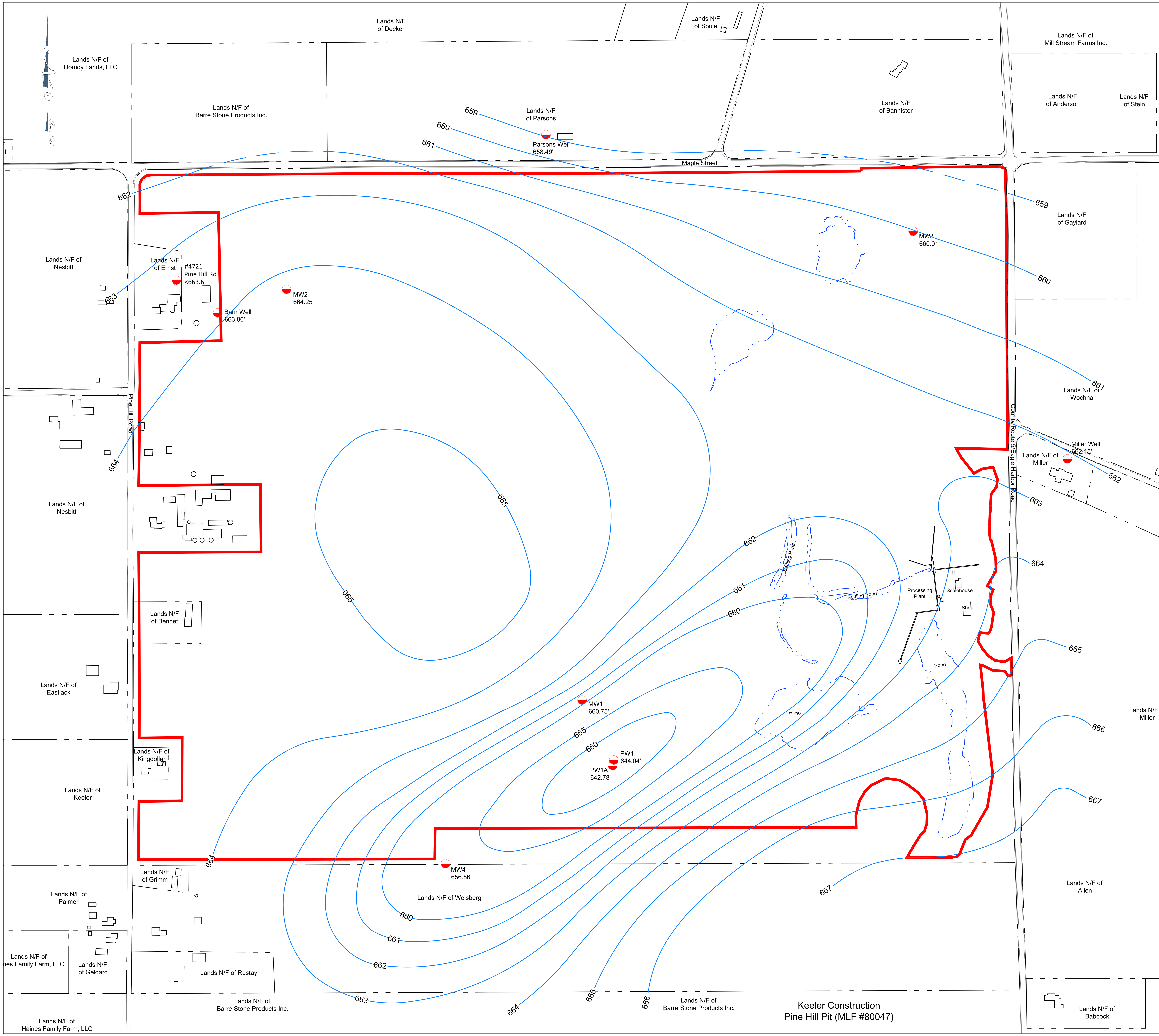
ALPHA GEOSCIENCE
Project # 15139

PLATE 6

BEDROCK
DRAWDOWN

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.
Town of Barre, Orleans County, New York

Z:\projects\2015\15121-15140\15139 - Eagle Harbor\15_0 GIS\Data\CAD\Bedrock Aquifer Drawdown for Eagle Harbor.dwg



LEGEND

- Property Line
- Life of Mine Boundary
- Stream/Edge of Water
- Structure
- Paved Road
- 660 Ground Water Elevation Contour, with elevation (ft AMSL)
- MW-4 667.17 Monitoring Well, or Residential Well, with ID and ground water elevation (ft AMSL)

SCALE

200 0 200 400 600 800

NOTES

Base Maps & Background Information
1. Base Map provided by Strategic Mining Solutions.

DETAILS

Horizontal Scale: 1" = 200'
Datum: Mean Sea Level
USGS Quad:

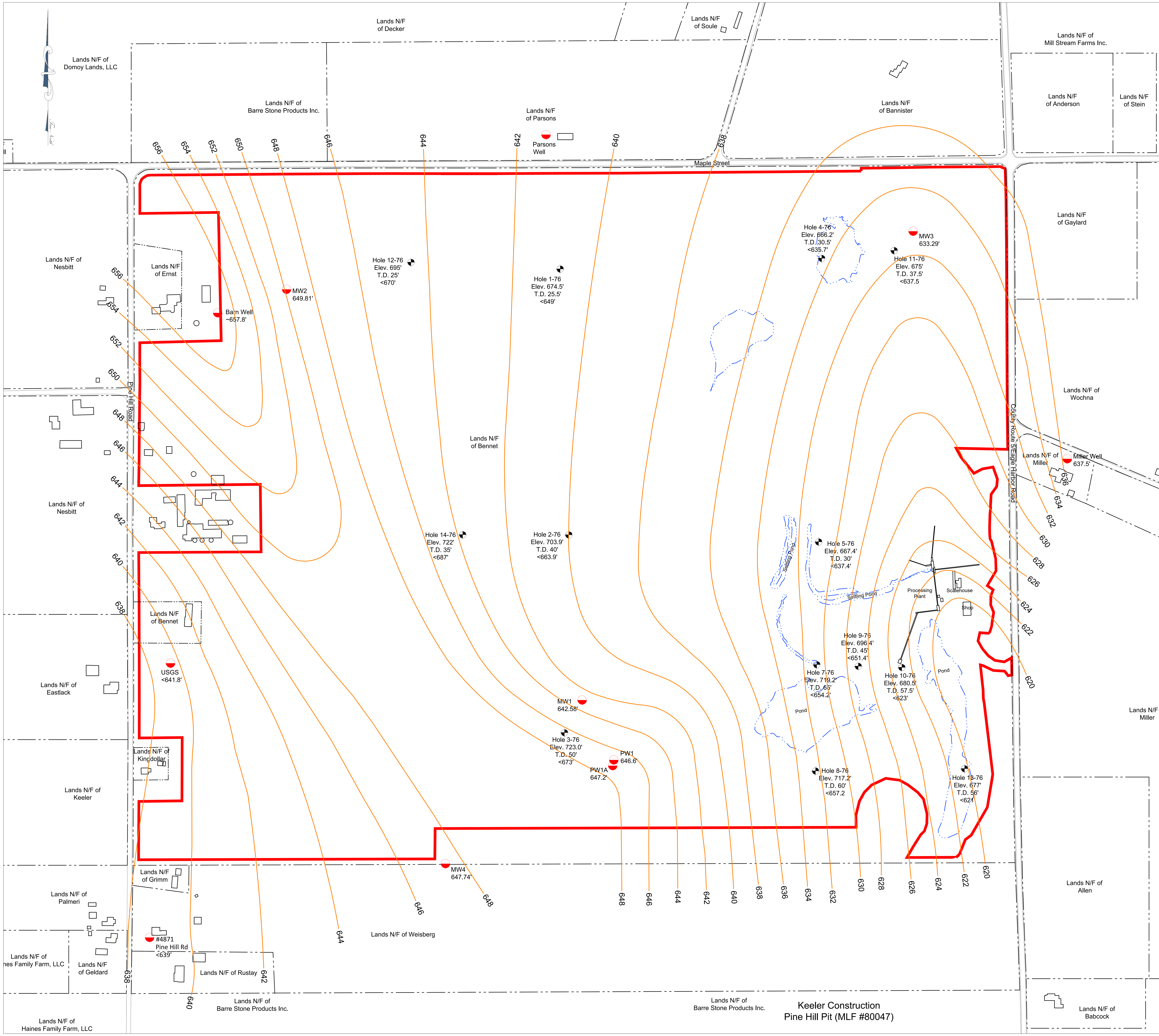
ALPHA GEOSCIENCE
Project # 15139

PLATE 7

BEDROCK
POTENTIOMETRIC SURFACE
(END OF TEST)

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.
Town of Barre, Orleans County, New York

Z:\projects\2015\15121-15140\15139 - Eagle Harbor\15_0 GIS\Data\CAD\Bedrock Aquifer - End of Test.dwg



Keeler Construction
Pine Hill Pit (MLF #80047)

LEGEND

- Property Line
- Life of Mine Boundary
- Stream/Edge of Water
- Structure
- Paved Road
- 680 Top of Bedrock Elevation Contour (ft AMSL)
- MW-4 647.74 Monitoring Well, or Residential Well, with ID and bedrock elevation (ft AMSL)
- Hole 2-76 Elev. 703.9' T.D. 40' <663.9' Historical Exploratory Hole, with ID, grade, total depth, and bedrock elevation

SCALE

200 0 200 400 600 800

NOTES

Base Maps & Background Information
1. Base Map provided by Strategic Mining Solutions.

DETAILS

Horizontal Scale: 1" = 200'
Datum: Mean Sea Level
USGS Quad:

ALPHA GEOSCIENCE
Project # 15139

PLATE 8

TOP OF BEDROCK STRUCTURAL CONTOURS

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.
Town of Barre, Orleans County, New York

APPENDICES

Appendix A
Pumping Test Protocol

Pumping Test Protocol (Revised 1-17-2020)
Eagle Harbor Sand & Gravel

This Eagle Harbor Sand & Gravel pumping test protocol was prepared by Alpha Geoscience, D.P.C., (Alpha) and is the second revision to the protocol that was previously forwarded to the NYSDEC in August, 2019. This revision is due to the results of preliminary testing on pumping wells that were recently installed at the site, a meeting with the NYSDEC on November 20, 2019, and comments provided by the NYSDEC in a January 14, 2020 letter to Tom Biamonte. As a result of the meeting, Eagle Harbor obtained a new pump and installed a new monitoring well. The well installations and testing to date are discussed in the following sections, followed by the Revised Well Testing Plan.

Drilling and Preliminary Testing

Well PW-1

Pumping well PW-1 was installed in September 2019 to a total depth of 95 feet below grade. The well was constructed of 6-inch diameter steel casing that was cemented five feet into the top of bedrock. Bedrock was encountered at 28 ft below grade. It was anticipated that the well would produce between 10 and 25 gallons per minute (gpm), based on the results of the residential well survey that was conducted in the area. Blow tests conducted with the drill rig just after well installation indicated the well yield was approximately 13 gpm; however, drawdown could not be measured during this test. Eagle Harbor Sand & Gravel (Eagle Harbor) purchased a submersible pump and installed it in the well to a depth of approximately 85 feet below grade.

A pumping test was begun on September 23, 2019 at the maximum pumping rate that the pump was capable of producing. The drawdown achieved after nearly 3 hours of pumping at 37 gpm was just over 16 ft (27 ft below the top of casing) and the water level appeared to have stabilized. In order to bring the pumping level down to within 10 feet of the pump, a drawdown of 76 feet would be necessary. It was clear that the existing pump would not be capable of producing this result in a reasonable time frame; consequently, the PW-1 pumping test was ended.

Analysis of the limited drawdown data indicated that at least 200-300 gpm would be necessary to draw down the pumping level sufficiently to complete the test in accordance with the pumping test protocol. A pump capable of yielding 200-300 gpm would not fit within a 6-inch diameter well; consequently, Eagle Harbor drilled a larger, 8-inch diameter well and purchased a pump that was capable of yielding 200-300 gpm.

Well PW-1A

A second pumping well, well PW-1A, was drilled approximately 25 feet south of well PW-1. Pumping well PW-1A was installed in October 2019 to a total depth of 86 feet below grade. The well was constructed of 8-inch diameter steel casing that was cemented ten feet into the top of bedrock. Bedrock was encountered at 28 ft below grade. Eagle Harbor installed the larger submersible pump in the well to a depth of approximately 83 feet below grade.

Eagle Harbor began a preliminary pumping test on October 24, 2019 to see if the new pump would be capable of drawing the water level in the well down to 73 ft (an equivalent drawdown of 64 ft). The test was run at approximately 265 gpm for nearly two days and the total drawdown was stabilized at only 23.7 ft. The water level was lowered to a depth approximately 2.5 feet below the top of the rock and was still within the casing. Limited water level monitoring at other wells was conducted during this test. The water level in bedrock wells MW-1 and MW-4 dropped approximately 5-6 feet during the test and rebounded completely within a couple hours after pump shutdown. None of the shallow wells (MW-1S through 4S) exhibited any drawdown; however, the water level in a nearby shallow pond approximately 75 feet to the east of PW-1A dropped a few inches during the test.

The results of the preliminary pumping test indicate there is a likely connection between the bedrock aquifer and the unconsolidated overburden east of PW-1A and explains the extraordinarily high pumping rates achievable at PW-1 and PW-1A. This connection appears to be limited elsewhere as evidenced by the lack of drawdown in the shallow wells, as well as the strong downward vertical gradients exhibited historically at the bedrock/shallow well pairs. A pumping test under these conditions may not be able to assist in the evaluation of potential impacts to bedrock residential wells located west of the site on Pine Hill Rd due to their distance.

It will, however, be able to help evaluate potential impacts on the wetland to the south and southeast of the site. It is proposed here to conduct the pumping test on PW-1A to assess the potential impact to the wetland due to excavation of the quarry.

Revised Well Testing Plan

A 72-hr well constant head test will be conducted on pumping well PW-1A. The NYSDEC asked in its December 10, 2019 NOIA that Eagle Harbor look into obtaining a pump capable of achieving a higher yield to better draw down the bedrock aquifer. Eagle Harbor, after discussions with its pump vendor, obtained a submersible pump that will fit within the 8-inch diameter well and is theoretically capable of achieving 350-400 gpm. The maximum yield of the pump will depend upon the amount of head above the pump and the resistance caused by the discharge hose/piping. Eagle Harbor will be utilizing approximately 530 feet of discharge pipe/hose and the discharge will be directed to a ditch that was excavated northward to a location approximately 1,500 feet north-northeast from the pumping well (Figures 1 and 2).

The well will be pumped at the maximum rate the pump can yield, which is anticipated to be over 350 gpm. The test pump will be set three to five feet off the bottom of the well. The discharge rate will be measured from the pipe approximately every hour for the first 24-hrs, then periodically until the end of the test. The flow in the ditch will be measured at two locations at least once each day during the test to allow for evaluation of the potential recirculation through the overburden and back to the pumping well. The discharge from the pumping well will eventually flow through the Maple Street culvert to the north. The Maple Street culvert is a 1.25-ft inner diameter HDPE culvert that can handle flow well over 3000 gpm.

Water Level Monitoring

Figure 1 shows the locations of all the wells and staff gauges to be monitored during the test. Figure 2 is a smaller scale map showing the monitoring locations and features around pumping well PW-1A. Water levels will be monitored at all six of the site bedrock wells (PW-1, PW-1A and MW-1 through MW-4); the five shallow overburden wells (MW-1S through MW-5S); well point WP-1; and, surface water monitoring locations (SG-1, SG-2, SG-3, SG-P, Maple Street culvert, Kams Rd culvert). Shallow overburden monitoring well MW-5S is a two-inch diameter well that was installed on December 19, 2019 in response to comments from the NYSDEC following the November 20, 2019 meeting. Well MW-5S is located between the pumping well and the southeastern wetland, as requested in the December 12, 2019 NOIA. Staff gage SG-P was installed in the shallow pond that is located approximately 75 ft south of pumping well PW-1A. If surface water is present in the southeastern wetland and the wetland directly east of the SG-1 pond at the time of the pumping test, staff gauges will be installed at those locations. Water levels will also be monitored at three residential wells, including the Barn well (which is not in use), the Parsons well on Maple St and the Miller well east of the site, all of which are bedrock wells. Water levels at the USGS well OL-20, which is west of the proposed quarry and completed in sand and gravel, are measured automatically every 15 minutes. Daily water levels are available online for well OL-20; however, the 15-minute data (if available) will be obtained from the USGS after the test.

A full round of water levels will be obtained within an hour or two prior to starting the 72-hr pumping test to serve as background water levels. Water levels will be monitored in pumping well PW-1A frequently during the first hour (probably every one to five minutes). Once the pumping level in PW-1A has become relatively stable, water levels in PW-1A will be measured every 30 to 60 minutes during the first 8 hrs, and every four hours after that. A round of water levels from all monitoring points (including staff gauges) will be obtained approximately every 4 hours (6 times per day); except for the residential wells. The residential wells will not be measured during the overnight period for safety reasons.

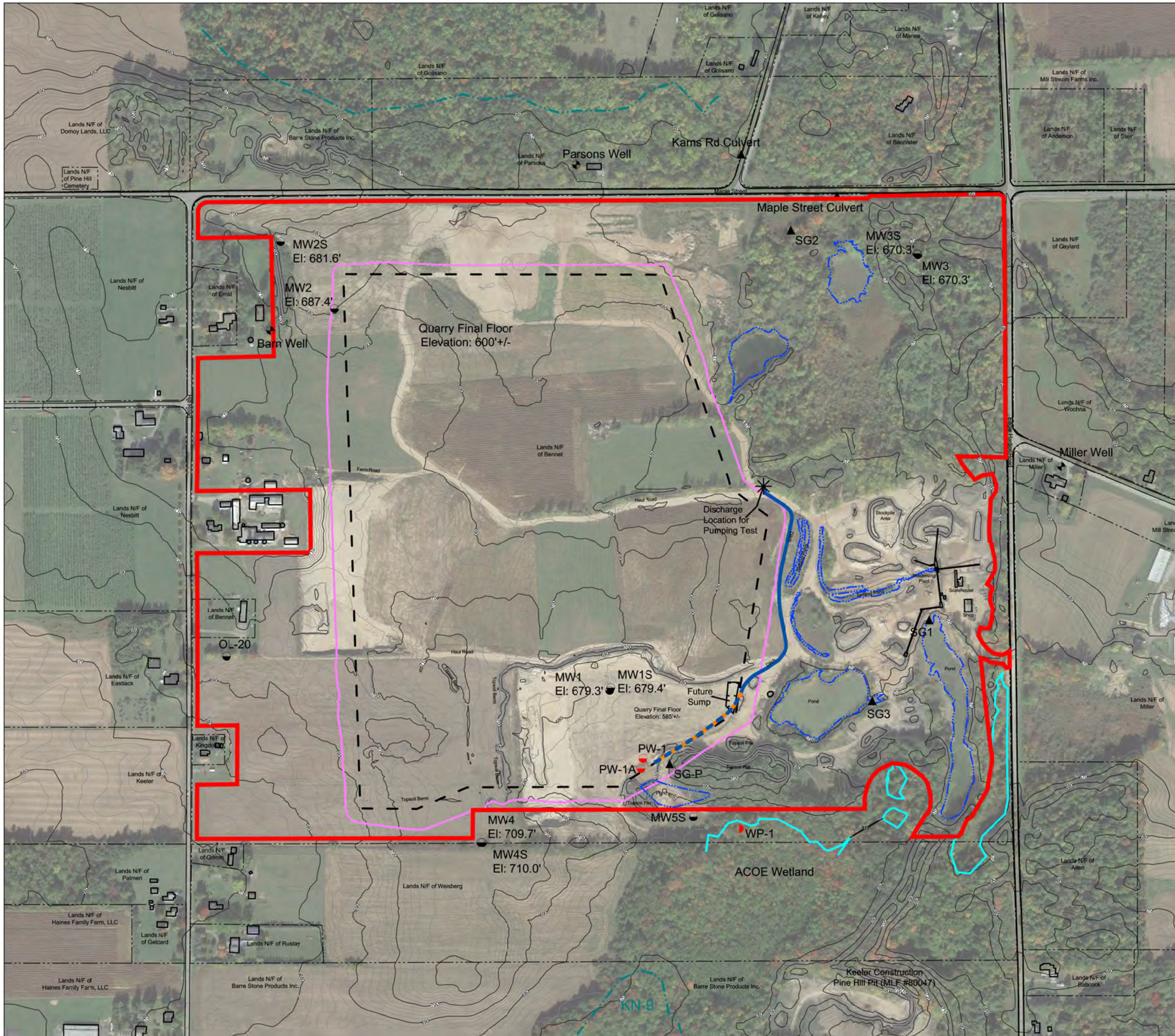
After pump shut off at 72 hours, the water level recovery in the pumping well will be monitored every minute for the first 10 minutes; every 10 minutes for the next 50 minutes; every 30 minutes for the next two hours; and every hour after that for at least 3 hours. A full round of water levels at the monitoring wells will be obtained two to four hours after pump shut down. A final round of water levels at all points, including the pumping well, will made the day following pump shutdown.

Water Quality Monitoring

A water quality sample will be collected from the pump discharge near the end of the pumping period and submitted to a laboratory for the following analyses: TCL VOCs via Method 8260, NYSDEC Petroleum SVOCs (CP 51) via Method 8270, EPA 8081 Organochlorine Pesticides, Total Metals (Na, Ca, Mg, Mn, Fe, K and Al), hardness, alkalinity, sulfide, chloride and total suspended solids. The sample will be collected from the end of the discharge pipe, or from a tap in the discharge pipe near the well head. Additionally, Alpha will monitor the following water quality parameters every four hours in the discharge water during the test: temperature, pH, total dissolved solids, and conductivity. These same field parameters will be measured every four hours in the water flowing through the Maple St culvert; however, the water quality at the Maple Street culvert will not be measured during the overnight period for safety reasons.

Data Analysis and Reporting

A well installation and testing report will be prepared by Alpha and submitted to the NYSDEC for review. The report will describe the test procedures, present the data collected from the test, and provide interpretations and conclusions. The report will include drilling logs and well completion logs for pumping well PW-1A and observation wells PW-1 and MW-5S. The results of field water quality measurements and laboratory water quality analysis will be included. Discharge rates and water level data collected in the field during well testing will be presented in tables and/or graphs as appropriate. A presentation of drawdown versus distance from the pumping well will be included.



LEGEND

- Property Line
- Life of Mine Boundary
- 700 — 10' Contour Line
- 2' Contour Line
- Stream/Edge of Water
- Limit of Bedrock Excavation
- Top of Graded Stripping Slope
- Ditch for Pumping Well Discharge
- Pumping Well Discharge Hose
- Delineated Federal Wetland Boundary
- Approximate State Wetland Boundary
- Staff Gauge
- Monitoring Well
- Pumping Well
- Residential Well
- Well Point

SCALE

500 0 500 1000 1500

NOTES

Base Maps & Background Information

1. Base Map provided by Strategic Mining Solutions, Mining and Reclamation Plan Map
2. Shallow water table monitoring wells are denoted with an "S" e.g. "MW-1S"

DETAILS

Topographic Survey Date: June 5, 2018
Horizontal Scale: 1" = 500'
Datum: Mean Sea Level
USGS Quad:
Contour Interval: 2 feet

ALPHA GEOSCIENCE
Project #15139

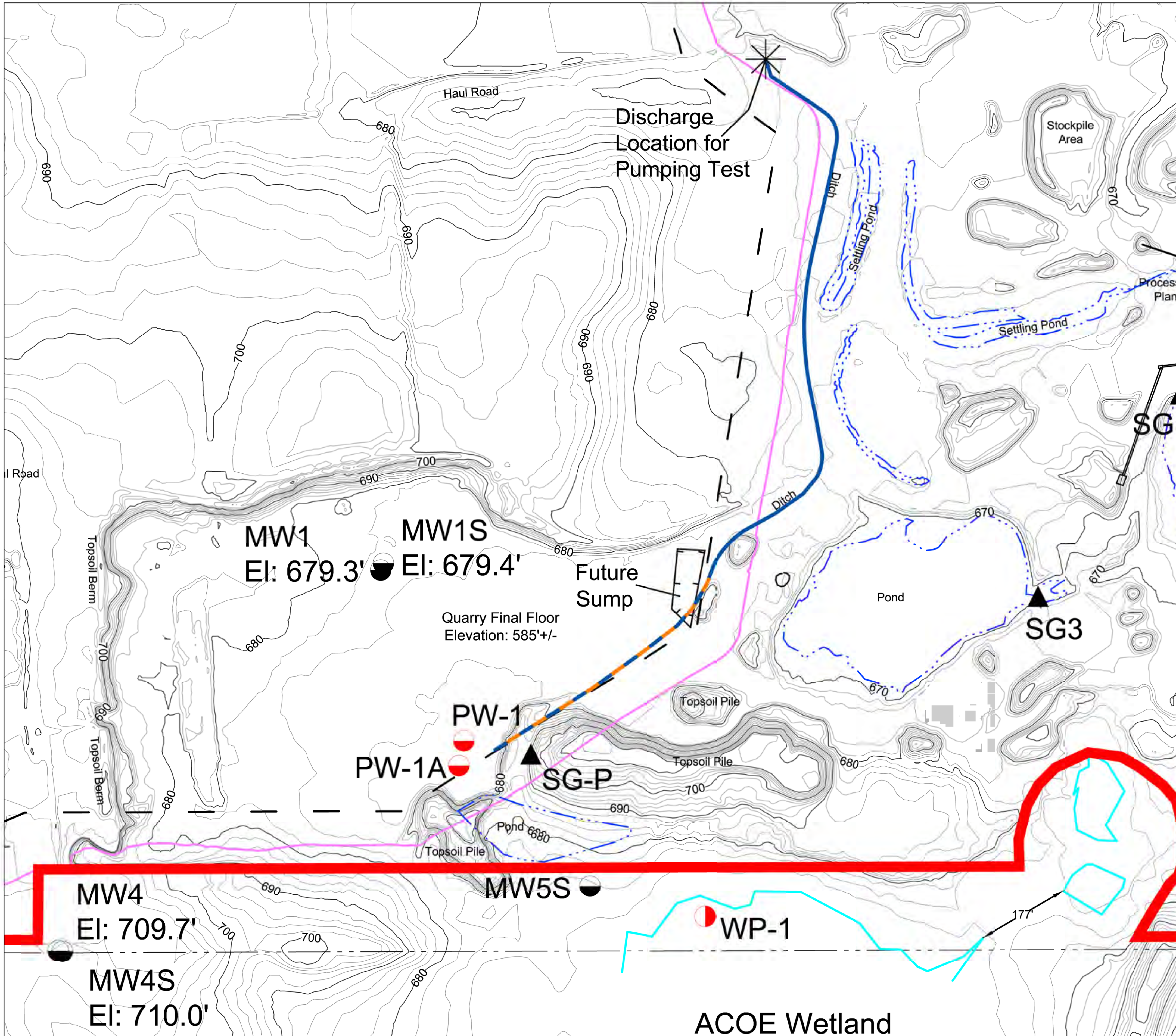
FIGURE 1

EAGLE HARBOR PUMPING TEST

Monitoring Locations

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.
Town of Barre, Orleans County, New York

Z:\projects\2015\15121-15140\15139 - Eagle Harbor\15_0 GIS\Data\CAD\Plate 1 Site Map.dwg



LEGEND

- Property Line
- Life of Mine Boundary
- 700 — 10' Contour Line
- 2' Contour Line
- Stream/Edge of Water
- Limit of Future Bedrock Excavation
- Top of Future Graded Stripping Slope
- Ditch for Pumping Well Discharge
- Pumping Well Discharge Hose
- Delineated Federal Wetland Boundary
- Staff Gauge
- Monitoring Well
- Pumping Well
- Residential Well
- Well Point

SCALE

200 0 200 400 600

NOTES

Base Maps & Background Information

1. Base Map provided by Strategic Mining Solutions, Mining and Reclamation Plan Map
2. Shallow water table monitoring wells are denoted with an "S" e.g. "MW-1S"

DETAILS

Topographic Survey Date: June 5, 2018
Horizontal Scale: 1" = 500'
Datum: Mean Sea Level
USGS Quad:
Contour Interval: 2 feet

ALPHA GEOSCIENCE
Project #15139

FIGURE 2
EAGLE HARBOR PUMPING TEST
Monitoring Locations
Near Pumping Well

Eagle Harbor Mine - Eagle Harbor Sand & Gravel, Inc.
Town of Barre, Orleans County, New York

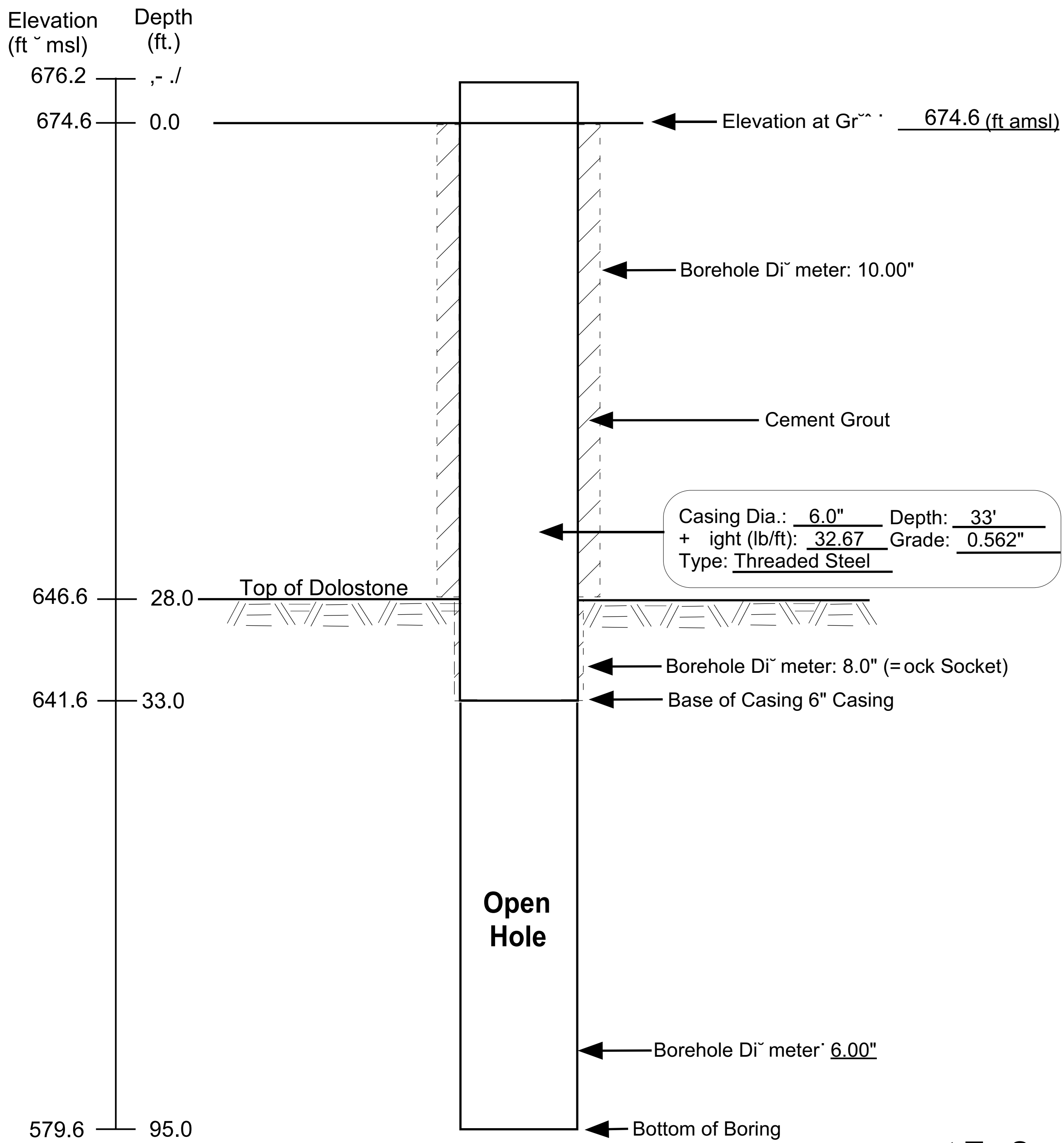
Z:\projects\2015\15121-15140\15139 - Eagle Harbor\15_0 GIS\Data\CAD\Figure 2 Site Map - Zoom In 11x17.dwg

Appendix B

Well Construction Diagrams for PW-1A, PW-1, and MW-5S

WELL COMPLETION LOG

Borehole: *+ ,-
Geologist: S. Spellm˘
T) pe of Borehole: *, mping W ll
Date Drilled: ., -/, 19 to 9--0, 19
Drilling Contractor: othnagl
Total Borehole Depth: . 12



ot To Scal

Geologi° Informatio ˙

0' - 20' Fine, reddish bro% sand. Medium plasticity.
43228' Fine brownish red sand; some light gr˘) gr˘ v l
47,95' Dark gr˘) dolostone cuttings; shal) tow˘ r˘ base.

ALPHA GEOSCIENCE
Proj. No. 15139

PW-1 COMPLETION LOG

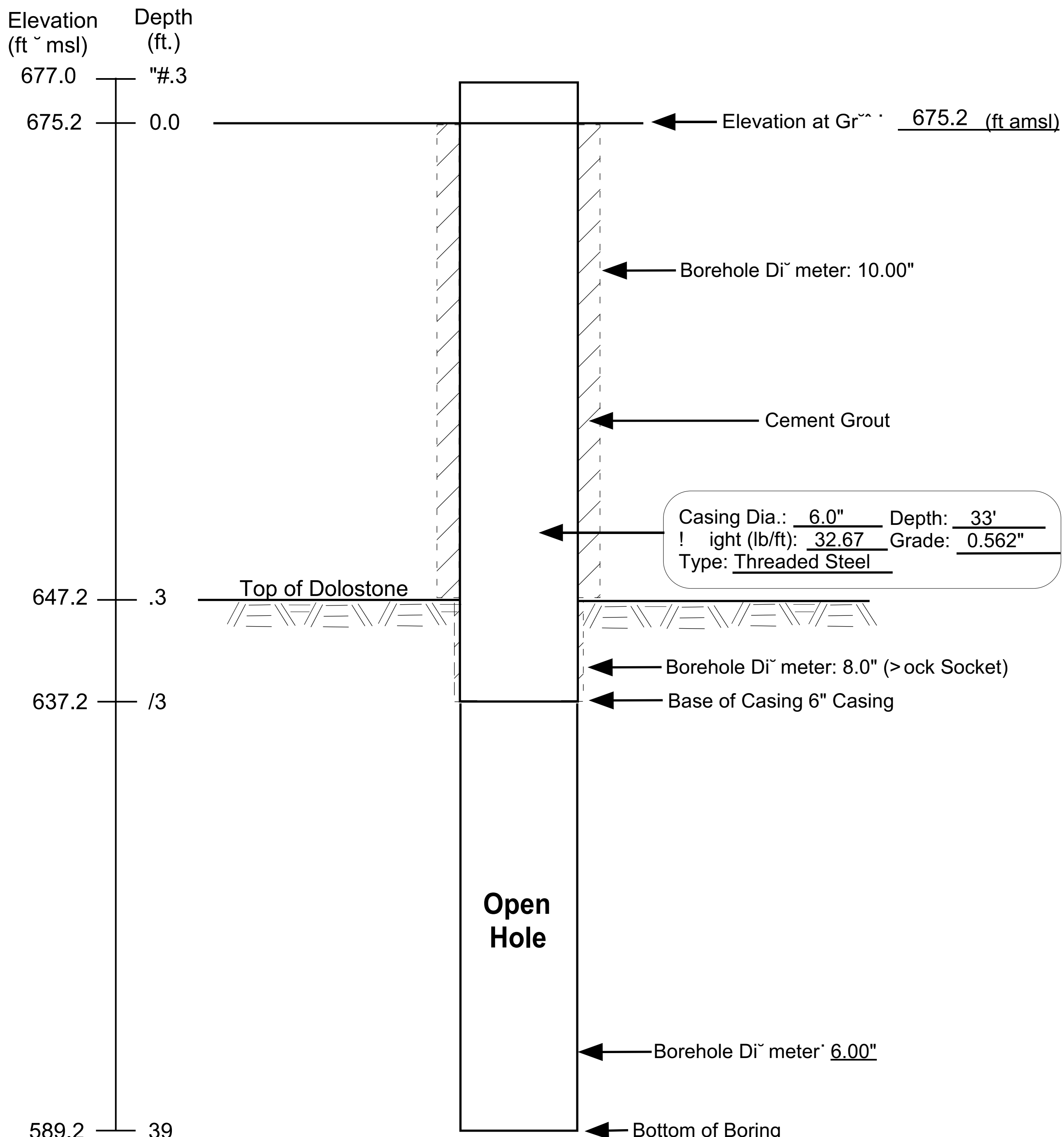
Eagle H˘ rbor Sand and Gravel

Albion, N % York

WELL COMPLETION LOG

Borehole: !" #&
Geologist:
T2pe of Borehole: umping Well

Date Drilled: October 21-23, 2019
Drilling Contractor: $othnagl
Total Borehole Depth: 345



$ot To Scal

Geologi° Information (from P! "1)˙

0' - 20' Fine, reddish bro) sand. Medium plasticity.
.05"28' Fine brownish red sand; some light gr˘ 2 gr˘ v l
.3" 95' Dark gr˘2 dolostone cuttings; shal 2 tow˘ rˆ base.

ALPHA GEOSCIENCE
Proj. No. 15139

PW-1A COMPLETION LOG

Eagle H˘ rbor Sand and Gravel

Albion, N) York

Z:\projects\..\15139 - Eagle Harbor\3_0 Field Records\P! "1 (9-16-19 to 9-17-19) Drill Notes\P! "1A Well Completion Log.cvs

NOTHNAGLE DRILLING, INC.
1821 Scottsville-Mumford Road
Scottsville, New York 14546
Phone (585) 538-2328
Fax (585) 538-2357

Test Boring No. MW-5S
Page ________
ND Job # ________

Project: Eagle Harbor
Client: ________
Elevation: ________ Start: 12/19 Completed: 12/19 Driller: Steve Lormy
Water Level - During Drilling: 7'
Inspector: ________
Water Level - At Completion: 7'
Seasonal and climatic changes may alter observed water levels.

Depth (ft)	C	Blows on Sampler 0"–6"	6"–12"	12"–18"	18"–24"	Sample N	Rec.	No.	Depth	Visual Soil and Rock Information Remarks
0										
5		3	4							
				4	5	8	17	1	5'-7'	Firm Br wet F/m Sand some F/m gravel
10		2	1							
				2	1	3	21	2	10-12	Loose Br wet F/m Sand trace F gravel
										—14'
15		8	8							
				8	10	16	20	3	15-17	Firm Br wet F/m gravel some F/m Sand
20		4	7							
				7	6	14	20	6	20-22	Firm Br wet F/m Sand and F/m gravel trace silt
		8	8							
25				9	8	17	21	7	23-25	Same
										— TO 25
30										Set well 25-5' (-10 Screen; Sand to 4'; Ben to 2'; Grout 0-2'; 1-4" Pro-Casing
35										
40										

N=No. of Blows to Drive 2" Spoon 12" with 140 lb. Wt. 30" Ea. Blow
C=No. of Blows to Drive ___ Casing ___ with ___ lb. Wt. ___ Ea. Blow
Transitional Depths are Estimated Based on Field Observations

Appendix C
Photographs

Photograph 1

Photograph 2

Photograph 3

Photograph 4

Photograph 5

Photograph 6

Photograph 7

Appendix D
Flow Calculations – Maple St Culvert

xu

Manning Formula Uniform Pipe Flow at Given Slope and Depth

Check out our spreadsheet version of this calculator Download Spreadsheet Open Google Sheets version View All Spreadsheets

Eagle Harbor - Maple Street Culvert Flow

2/5/2020 15:33; Depth of Water = 0.29 ft; Velocity = 3.8 ft/sec

Inputs

Pipe diameter, d_0	1.25	ft
Manning roughness, n	0.010111	
Pressure slope (possibly ? equal to pipe slope), S_0	0.007	rise/run
Percent of (or ratio to) full depth (100% or 1 if flowing full)	23.2	%

Results

Flow, Q	368.1456	gpm
Velocity, v	3.8000	ft/sec
Velocity head, h_v	0.2244	ft H2O
Flow area	0.2159	ft^2
Wetted perimeter	1.2564	ft
Hydraulic radius	0.1718	ft
Top width, T	1.0553	ft
Froude number, F	1.48	
Shear stress (tractive force), tau	0.0751	psf

xu

Manning Formula Uniform Pipe Flow at Given Slope and Depth

Check out our spreadsheet version of this calculator Download Spreadsheet Open Google Sheets version View All Spreadsheets

Eagle Harbor - Maple Street Culvert Flow

2/6/2020 10:55; Depth of Water = 0.29 ft; Velocity = 3.7 ft/sec

Inputs

Pipe diameter, d_0	1.25	ft
Manning roughness, n	0.0103842	
Pressure slope (possibly ? equal to pipe slope), S_0	0.007	rise/run
Percent of (or ratio to) full depth (100% or 1 if flowing full)	23.2	%

Results

Flow, Q	358.4600	gpm
Velocity, v	3.7000	ft/sec
Velocity head, h_v	0.2128	ft H2O
Flow area	0.2159	ft^2
Wetted perimeter	1.2564	ft
Hydraulic radius	0.1718	ft
Top width, T	1.0553	ft
Froude number, F	1.44	
Shear stress (tractive force), tau	0.0751	psf

Appendix E
Water Level Data – Observation wells and Staff Gauges

PW-1 Water Levels
PW-1A Pumping Test
Eagle Harbor Mine

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		-			
2/3/2020 17:47	0	5.84	0	670.36	Static
2/3/2020 17:57	10	34.35	28.51	641.85	
2/3/2020 18:08	21	32.08	26.24	644.12	
2/3/2020 18:33	46	32.67	26.83	643.53	
2/3/2020 22:04	257	30.31	24.47	645.89	
2/4/2020 2:11	504	30.42	24.58	645.78	
2/4/2020 6:04	737	30.86	25.02	645.34	
2/4/2020 8:59	912	35.49	29.65	640.71	
2/4/2020 10:10	983	33.76	27.92	642.44	
2/4/2020 12:01	1094	32.67	26.83	643.53	
2/4/2020 13:59	1212	32.63	26.79	643.57	
2/4/2020 18:00	1453	33.57	27.73	642.63	
2/4/2020 22:04	1697	32.72	26.88	643.48	
2/5/2020 1:51	1924	33.25	27.41	642.95	
2/5/2020 5:35	2148	32.98	27.14	643.22	
2/5/2020 11:09	2482	33.38	27.54	642.82	
2/5/2020 14:23	2676	33.23	27.39	642.97	
2/5/2020 19:21	2974	32.13	26.29	644.07	
2/5/2020 22:03	3136	32.67	26.83	643.53	
2/6/2020 2:03	3376	32.7	26.86	643.5	
2/6/2020 6:04	3617	33.56	27.72	642.64	
2/6/2020 9:28	3821	31.96	26.12	644.24	
2/6/2020 13:38	4071	32.16	26.32	644.04	
2/6/2020 18:50	4383	7.66	1.82	668.54	Recovery
2/6/2020 20:30	4483	7.05	1.21	669.15	
2/7/2020 12:00	5413	6.9	1.06	669.3	
2/18/2020 12:00	21253	6.42	0.58	669.78	

PG-1 Water Levels
PW-1A Pumping Test
Eagle Harbor Mine

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		-			
2/3/2020 17:45	0	0.58	0	671.62	Static
2/3/2020 18:10	23	0.58	0	671.62	
2/3/2020 18:34	47	0.58	0	671.62	
2/3/2020 20:11	144	0.57	-0.01	671.63	
2/3/2020 22:58	311	0.57	-0.01	671.63	
2/4/2020 3:30	583	0.58	0	671.62	
2/4/2020 6:15	748	0.60	0.02	671.60	
2/4/2020 9:03	916	0.60	0.02	671.60	
2/4/2020 11:54	1087	0.62	0.04	671.58	
2/4/2020 22:06	1699	0.68	0.1	671.52	
2/5/2020 1:48	1921	0.71	0.13	671.49	
2/5/2020 5:32	2145	0.72	0.14	671.48	
2/5/2020 8:33	2326	0.72	0.14	671.48	Break Ice
2/5/2020 11:16	2489	0.72	0.14	671.48	Break Ice
2/5/2020 14:25	2678	0.72	0.14	671.48	Break ice
2/5/2020 18:22	2915	0.72	0.14	671.48	
2/5/2020 22:05	3138	0.79	0.21	671.41	
2/6/2020 2:05	3378	0.79	0.21	671.41	
2/6/2020 6:07	3620	0.79	0.21	671.41	
2/6/2020 10:08	3861	0.82	0.24	671.38	Break ice
2/6/2020 13:41	4074	0.85	0.27	671.35	Break ice
2/6/2020 19:10	4403	0.87	0.29	671.33	Recovery
2/8/2020 9:42	6715	0.76	0.18	671.44	
2/18/2020 12:00	21253	0.75	0.17	671.45	

MW-1 and MW-1S Water Levels
PW-1A Pumping Test
Eagle Harbor Mine

MW-1

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020		10.10			
2/3/2020	0	10.09	0.00	669.24	Static
2/3/2020 22:24	277	16.87	6.78	662.46	
2/4/2020 2:07	500	16.98	6.89	662.35	
2/4/2020 6:11	744	17.16	7.07	662.17	
2/4/2020 10:26	999	18.01	7.92	661.32	
2/4/2020 14:30	1243	18.21	8.12	661.12	
2/4/2020 18:05	1458	18.29	8.20	661.04	
2/4/2020 22:11	1704	18.25	8.16	661.08	
2/5/2020 1:54	1927	18.52	8.43	660.81	
2/5/2020 5:38	2151	18.56	8.47	660.77	
2/5/2020 11:04	2477	18.68	8.59	660.65	
2/5/2020 14:17	2670	18.72	8.63	660.61	
2/5/2020 19:27	2980	18.52	8.43	660.81	
2/5/2020 22:08	3141	18.61	8.52	660.72	
2/6/2020 2:07	3380	18.59	8.50	660.74	
2/6/2020 6:13	3626	18.64	8.55	660.69	
2/6/2020 10:00	3853	18.54	8.45	660.79	
2/6/2020 13:58	4091	18.58	8.49	660.75	
2/6/2020 18:45	4378	11.25	1.16	668.08	Recovery
2/6/2020 20:34	4487	10.49	0.40	668.84	
2/7/2020 16:50	5703	10.26	0.17	669.07	
2/18/2020 12:00	21253	10	-0.09	669.33	

MW-1S

Date and Time	Time Elapsed Since Pumping Started (hh:mm)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		4.55	0.06		
2/3/2020 10:00	0	4.49	0.00	674.92	Static
2/3/2020 22:23	276	4.49	0.00	674.92	
2/4/2020 2:07	500	4.59	0.10	674.82	
2/4/2020 6:09	742	4.62	0.13	674.79	
2/4/2020 10:22	995	4.81	0.32	674.60	
2/4/2020 14:29	1242	4.94	0.45	674.47	
2/4/2020 18:04	1457	5.01	0.52	674.40	
2/4/2020 22:13	1706	5.11	0.62	674.30	
2/5/2020 1:56	1929	5.20	0.71	674.21	
2/5/2020 5:40	2153	5.34	0.85	674.07	
2/5/2020 11:05	2478	5.44	0.95	673.97	
2/5/2020 14:16	2669	5.47	0.98	673.94	
2/5/2020 19:28	2981	5.58	1.09	673.83	
2/5/2020 22:09	3142	5.61	1.12	673.80	
2/6/2020 2:08	3381	5.60	1.11	673.81	
2/6/2020 6:14	3627	5.69	1.20	673.72	
2/6/2020 10:02	3855	5.75	1.26	673.66	
2/6/2020 13:59	4092	5.80	1.31	673.61	
2/6/2020 18:46	4379	5.90	1.41	673.51	recovery
2/6/2020 20:30	4483	5.70	1.21	673.71	
2/7/2020 16:53	5706	5.66	1.17	673.75	
2/18/2020 0:00	20533	5.90	1.41	673.51	

MW-2 and MW-2S Water Levels
PW-1A Pumping Test
Eagle Harbor Mine

MW-2

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		22.40	0.07	665.04	
2/3/2020 16:58	0	22.33	0.00	665.11	Static
2/3/2020 23:54	367	22.86	0.53	664.58	
2/4/2020 3:10	563	22.87	0.54	664.57	
2/4/2020 7:35	828	22.96	0.63	664.48	
2/4/2020 11:14	1047	23.04	0.71	664.40	
2/4/2020 15:00	1273	23.04	0.71	664.40	
2/4/2020 19:22	1535	23.13	0.80	664.31	
2/4/2020 23:04	1757	23.11	0.78	664.33	
2/5/2020 2:48	1981	23.16	0.83	664.28	
2/5/2020 6:28	2201	23.19	0.86	664.25	
2/5/2020 11:43	2516	23.22	0.89	664.22	
2/5/2020 14:58	2711	23.19	0.86	664.25	
2/5/2020 17:30	2863	23.18	0.85	664.26	
2/5/2020 22:51	3184	23.14	0.81	664.30	
2/6/2020 3:02	3435	23.11	0.78	664.33	
2/6/2020 7:37	3710	23.13	0.80	664.31	
2/6/2020 10:34	3887	23.14	0.81	664.30	
2/6/2020 14:18	4111	23.15	0.82	664.29	
2/6/2020 19:21	4414	22.60	0.27	664.84	Recovery
2/6/2020 20:53	4506	22.41	0.08	665.03	
2/8/2020 10:25	6758	22.40	0.07	665.04	
2/18/2020 12:00	21253	22.27	-0.06	665.17	

MW-2S

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		14.35	0.18	667.25	
2/3/2020 17:04	0	14.17	0	667.43	Static
2/3/2020 23:50	363	14.15	-0.02	667.45	
2/4/2020 3:05	558	14.15	-0.02	667.45	
2/4/2020 7:31	824	14.18	0.01	667.42	
2/4/2020 11:10	1043	14.18	0.01	667.42	
2/4/2020 14:57	1270	14.17	0.00	667.43	
2/4/2020 19:17	1530	14.18	0.01	667.42	
2/4/2020 23:00	1753	14.18	0.01	667.42	
2/5/2020 2:43	1976	14.19	0.02	667.41	
2/5/2020 6:24	2197	14.19	0.02	667.41	
2/5/2020 11:48	2521	14.20	0.03	667.40	
2/5/2020 15:00	2713	14.19	0.02	667.41	
2/5/2020 17:34	2867	14.18	0.01	667.42	
2/5/2020 22:47	3180	14.16	-0.01	667.44	
2/6/2020 2:55	3428	14.14	-0.03	667.46	
2/6/2020 7:39	3712	14.14	-0.03	667.46	
2/6/2020 10:37	3890	14.15	-0.02	667.45	
2/6/2020 14:20	4113	14.15	-0.02	667.45	
2/6/2020 19:23	4416	14.14	-0.03	667.46	Recovery
2/6/2020 20:56	4509	14.14	-0.03	667.46	
2/8/2020 10:26	6759	14.28	0.11	667.32	
2/18/2020 12:00	21253	14.23	0.06	667.37	

MW-3 and MW-3S Water Levels
PW-1A Pumping Test
Eagle Harbor Mine

MW-3

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		9.98	-0.02	660.27	
2/3/2020 17:25	0	10.00	0	660.25	Static
2/4/2020 0:04	377	10.12	0.12	660.13	
2/4/2020 3:23	576	10.20	0.20	660.05	
2/4/2020 8:37	890	10.26	0.26	659.99	
2/4/2020 11:42	1075	10.29	0.29	659.96	
2/4/2020 15:54	1327	10.30	0.30	659.95	
2/4/2020 19:34	1547	10.31	0.31	659.94	
2/4/2020 23:15	1768	10.32	0.32	659.93	
2/5/2020 3:00	1993	10.34	0.34	659.91	
2/5/2020 6:39	2212	10.29	0.29	659.96	
2/5/2020 12:10	2543	10.31	0.31	659.94	
2/5/2020 15:21	2734	10.28	0.28	659.97	
2/5/2020 17:52	2885	10.28	0.28	659.97	
2/5/2020 23:02	3195	10.24	0.24	660.01	
2/6/2020 3:19	3452	10.21	0.21	660.04	
2/6/2020 8:05	3738	10.24	0.24	660.01	
2/6/2020 11:01	3914	10.24	0.24	660.01	
2/6/2020 14:39	4132	10.24	0.24	660.01	
2/6/2020 19:30	4423	10.10	0.10	660.15	Recovery
2/6/2020 20:00	4453	10.02	0.02	660.23	
2/8/2020 10:59	6792	10.21	0.21	660.04	
2/18/2020 12:00	21253	10.13	0.13	660.12	

MW-3S

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		8.53	-0.07	661.76	
2/3/2020 17:24	0	8.60	0	661.69	Static
2/4/2020 0:43	416	8.48	-0.12	661.81	
2/4/2020 3:22	575	8.46	-0.14	661.83	
2/4/2020 8:36	889	8.54	-0.06	661.75	
2/4/2020 11:41	1074	8.55	-0.05	661.74	
2/4/2020 15:53	1326	8.44	-0.16	661.85	
2/4/2020 19:32	1545	8.55	-0.05	661.74	
2/4/2020 23:14	1767	8.55	-0.05	661.74	
2/5/2020 3:01	1994	8.57	-0.03	661.72	
2/5/2020 6:37	2210	8.59	-0.01	661.70	
2/5/2020 12:12	2545	8.47	-0.13	661.82	
2/5/2020 15:22	2735	8.60	0.00	661.69	
2/5/2020 17:54	2887	8.59	-0.01	661.70	
2/5/2020 23:01	3194	8.56	-0.04	661.73	
2/6/2020 3:20	3453	8.53	-0.07	661.76	
2/6/2020 8:06	3739	8.58	-0.02	661.71	
2/6/2020 11:02	3915	8.59	-0.01	661.70	
2/6/2020 14:40	4133	8.60	0.00	661.69	
2/6/2020 19:32	4425	8.60	0.00	661.69	Recovery
2/6/2020 20:02	4455	8.59	-0.01	661.70	
2/8/2020 11:00	6793	8.81	0.21	661.48	
2/18/2020 12:00	21253	8.8	0.20	661.49	

MW-4 and MW-4S Water Levels
PW-1A Pumping Test
Eagle Harbor Mine

MW-4

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		42.4	-0.10	667.27	
2/3/2020 17:00	0	42.5	0	667.17	Static
2/3/2020 22:41	294	51.44	8.94	658.23	
2/4/2020 2:17	510	51.5	9.00	658.17	
2/4/2020 6:41	774	51.77	9.27	657.9	
2/4/2020 10:32	1005	52.68	10.18	656.99	
2/4/2020 14:25	1238	53.03	10.53	656.64	
2/4/2020 18:11	1464	52.97	10.47	656.7	
2/4/2020 22:37	1730	53	10.50	656.67	
2/5/2020 2:18	1951	53.1	10.60	656.57	
2/5/2020 6:03	2176	53.29	10.79	656.38	
2/5/2020 10:51	2464	53.14	10.64	656.53	
2/5/2020 14:08	2661	53.15	10.65	656.52	
2/5/2020 19:48	3001	52.82	10.32	656.85	
2/5/2020 22:26	3159	52.95	10.45	656.72	
2/6/2020 2:30	3403	52.94	10.44	656.73	
2/6/2020 6:43	3656	52.91	10.41	656.76	
2/6/2020 9:43	3836	52.82	10.32	656.85	
2/6/2020 13:50	4083	52.81	10.31	656.86	
2/6/2020 18:58	4391	43.81	1.31	665.86	Recovery
2/6/2020 20:43	4496	43.09	0.59	666.58	
2/7/2020 17:45	5758	42.72	0.22	666.95	
2/18/2020 12:00	21253	42.5	0.00	667.17	

MW-4S

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		32.09	0.04	677.89	
2/3/2020 17:00	0	32.05	0	677.93	Static, Top of Steel
2/3/2020 22:44	297	31.84	-0.21	678.14	
2/4/2020 2:20	513	31.84	-0.21	678.14	
2/4/2020 6:43	776	31.9	-0.15	678.08	
2/4/2020 10:31	1004	31.95	-0.10	678.03	
2/4/2020 14:24	1237	31.93	-0.12	678.05	
2/4/2020 18:10	1463	31.99	-0.06	677.99	
2/4/2020 22:36	1729	32.01	-0.04	677.97	
2/5/2020 2:19	1952	32	-0.05	677.98	
2/5/2020 6:01	2174	32.03	-0.02	677.95	
2/5/2020 10:53	2466	32.01	-0.04	677.97	
2/5/2020 14:10	2663	31.89	-0.16	678.09	
2/5/2020 19:47	3000	31.87	-0.18	678.11	
2/5/2020 22:25	3158	31.8	-0.25	678.18	
2/6/2020 2:31	3404	31.76	-0.29	678.22	
2/6/2020 6:41	3654	31.79	-0.26	678.19	
2/6/2020 9:45	3838	31.78	-0.27	678.2	
2/6/2020 13:53	4086	31.8	-0.25	678.18	
2/6/2020 19:00	4393	31.84	-0.21	678.14	Recovery
2/6/2020 20:45	4498	31.8	-0.25	678.18	
2/7/2020 12:00	5413	31.82	-0.23	678.16	
2/18/2020 12:00	21253	31.4	-0.65	678.58	

MW-5S Water Levels
PW-1A Pumping Test
Eagle Harbor Mine

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		6.9	-0.06	670.87	
2/3/2020 17:00	0	6.96	0	670.81	Static
2/3/2020 19:45	118	7.47	0.51	670.30	
2/3/2020 22:52	305	7.58	0.62	670.19	
2/4/2020 2:27	520	7.64	0.68	670.13	
2/4/2020 6:25	758	7.73	0.77	670.04	
2/4/2020 9:55	968	7.84	0.88	669.93	
2/4/2020 14:03	1216	7.88	0.92	669.89	
2/4/2020 17:44	1437	7.93	0.97	669.84	
2/4/2020 22:20	1713	7.98	1.02	669.79	
2/5/2020 2:01	1934	8.03	1.07	669.74	
2/5/2020 5:46	2159	8.07	1.11	669.70	
2/5/2020 10:46	2459	8.12	1.16	669.65	
2/5/2020 14:00	2653	8.19	1.23	669.58	
2/5/2020 19:34	2987	8.17	1.21	669.60	
2/5/2020 22:13	3146	8.18	1.22	669.59	
2/6/2020 2:13	3386	8.21	1.25	669.56	
2/6/2020 9:33	3826	8.26	1.30	669.51	
2/6/2020 13:44	4077	8.28	1.32	669.49	
2/6/2020 18:53	4386	7.87	0.91	669.90	Recovery
2/6/2020 20:38	4491	7.68	0.72	670.09	
2/7/2020 12:00	5413	7.47	0.51	670.30	

SG-1 Water Levels
PW-1A Pumping Test
Eagle Harbor Mine

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		-			
2/3/2020 17:00	0	0.75	0	667.25	
2/4/2020 2:56	549	0.75	0.00	667.25	
2/4/2020 7:05	798	0.75	0.00	667.25	
2/4/2020 10:42	1015	0.75	0.00	667.25	
2/4/2020 14:37	1250	0.75	0.00	667.25	
2/4/2020 18:45	1498	0.75	0.00	667.25	
2/4/2020 22:52	1745	0.75	0.00	667.25	
2/5/2020 1:51	1924	0.75	0.00	667.25	
2/5/2020 6:15	2188	0.76	0.01	667.24	
2/5/2020 8:13	2306	0.75	0.00	667.25	
2/5/2020 12:45	2578	0.75	0.00	667.25	Break ice
2/5/2020 14:44	2697	0.75	0.00	667.25	Break ice
2/5/2020 18:04	2897	0.75	0.00	667.25	
2/5/2020 22:39	3172	0.76	0.01	667.24	
2/6/2020 2:40	3413	0.76	0.01	667.24	
2/6/2020 7:20	3693	0.75	0.00	667.25	
2/6/2020 10:15	3868	0.75	0.00	667.25	
2/6/2020 14:08	4101	0.75	0.00	667.25	Break ice
2/6/2020 19:15	4408	0.75	0.00	667.25	Recovery
2/8/2020 9:58	6731	0.65	-0.10	667.35	
2/18/2020 12:00	21253	0.64	-0.11	667.36	

Water Levels from Private Wells
PW-1A Pumping Test
Eagle Harbor Mine

Parsons

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		-			
2/3/2020 16:48	0	10.9	0	658.6	Static; All measurements from TOC
2/4/2020 8:05	858	11	0.1	658.5	
2/4/2020 11:04	1037	11.1	0.2	658.4	
2/4/2020 15:08	1281	11.45	0.55	658.05	School bus dropped off student at approx 15:00 (observed)
2/4/2020 17:06	1399	11.05	0.15	658.45	
2/5/2020 8:01	2294	11.15	0.25	658.35	
2/5/2020 11:53	2526	11.21	0.31	658.29	
2/5/2020 15:06	2719	11.59	0.69	657.91	School bus likely dropped off student at approx 15:00
2/5/2020 17:15	2848	11.61	0.71	657.89	
2/6/2020 7:45	3718	11.01	0.11	658.49	
2/6/2020 10:40	3893	11.01	0.11	658.49	
2/6/2020 14:23	4116	11.01	0.11	658.49	
2/8/2020 10:35	6768	11.94	1.04	657.56	Recovery
2/18/2020 12:00	21253	11.19	0.29	658.31	

Barn

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00					
2/3/2020 10:00	0	45.70	0	664.48	Static
2/4/2020 7:48	841	46.16	0.46	664.02	
2/4/2020 10:56	1029	46.22	0.52	663.96	
2/4/2020 14:48	1261	46.21	0.51	663.97	
2/5/2020 7:50	2283	46.40	0.70	663.78	
2/5/2020 11:39	2512	46.38	0.68	663.80	
2/5/2020 14:54	2707	46.36	0.66	663.82	
2/5/2020 17:25	2858	46.36	0.66	663.82	
2/6/2020 7:30	3703	46.30	0.60	663.88	
2/6/2020 10:30	3883	46.32	0.62	663.86	
2/6/2020 14:15	4108	46.32	0.62	663.86	
2/8/2020 10:15	6748	45.92	0.22	664.26	Recovery
2/18/2020 12:00	21253	45.61	-0.09	664.57	

Miller

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020 12:00		37.04	0.10	661.97	all measurements from top of steel casing
2/3/2020 17:00	0	36.94	0	662.07	Static
2/4/2020 8:47	900	36.9	-0.04	662.11	
2/4/2020 12:10	1103	36.86	-0.08	662.15	
2/4/2020 16:02	1335	36.59	-0.35	662.42	
2/5/2020 8:08	2301	36.86	-0.08	662.15	
2/5/2020 12:22	2555	36.86	-0.08	662.15	
2/5/2020 15:40	2753	36.86	-0.08	662.15	
2/5/2020 17:07	2840	36.86	-0.08	662.15	
2/6/2020 8:13	3746	36.87	-0.07	662.14	
2/6/2020 11:12	3925	36.84	-0.10	662.17	
2/6/2020 14:49	4142	36.86	-0.08	662.15	
2/18/2020 12:00	21253	36.75	-0.19	662.26	

Water Levels at Culverts
PW-1A Pumping Test
Eagle Harbor Mine

Maple

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Remarks
1/30/2020 12:00		-		
2/3/2020 17:14	0	0.77	0	Static; all measurements from lower lip of top of culvert; flow = 63.6 gpm
2/4/2020 8:05	858	0.64	-0.13	195.3 gpm
2/4/2020 11:30	1063	0.56	-0.21	
2/4/2020 15:17	1290	0.52	-0.25	273 gpm at 13:18
2/5/2020 7:24	2257	0.52	-0.25	306 gpm at 9:30
2/5/2020 12:04	2537	0.52	-0.25	
2/5/2020 15:15	2728	0.5	-0.27	368 gpm at 15:33 (calculated - see Appendix D)
2/5/2020 17:45	2878	0.51	-0.26	
2/6/2020 7:57	3730	0.48	-0.29	
2/6/2020 10:48	3901	0.47	-0.3	358 gpm at 10:55 (calculated - see Appendix D)
2/6/2020 14:31	4124	0.47	-0.3	
2/8/2020 10:55	6788	1.02	0.25	
2/18/2020 12:00	21253	1.15	0.38	

Kams

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Remarks
1/30/2020 12:00		1.60	0.30	
2/3/2020 17:09	0	1.30	0	Static; all measurements from orange mark on top of culvert
2/4/2020 8:02	855	1.19	-0.11	
2/4/2020 11:23	1056	1.15	-0.15	
2/4/2020 15:13	1286	1.11	-0.19	
2/5/2020 7:35	2268	1.10	-0.20	
2/5/2020 12:00	2533	1.10	-0.20	
2/5/2020 15:14	2727	1.09	-0.21	
2/5/2020 17:39	2872	1.09	-0.21	
2/6/2020 7:54	3727	1.09	-0.21	
2/6/2020 10:44	3897	1.09	-0.21	
2/6/2020 14:27	4120	1.09	-0.21	
2/8/2020 10:45	6778	1.53	0.23	
2/18/2020 12:00	21253	1.50	0.20	

WP-1 Water Levels
PW-1A Pumping Test
Eagle Harbor Mine

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (ft)	Water Level Elevation	Remarks
1/30/2020		-			
2/3/2020 15:40	0	2.27	0	670.23	Static
2/3/2020 23:13	326	2.31	0.04	670.19	
2/4/2020 2:35	528	2.31	0.04	670.19	
2/4/2020 6:32	765	2.34	0.07	670.16	
2/4/2020 10:00	973	2.32	0.05	670.18	
2/4/2020 14:13	1226	2.32	0.05	670.18	
2/4/2020 18:51	1504	2.32	0.05	670.18	
2/4/2020 22:28	1721	2.36	0.09	670.14	
2/5/2020 2:09	1942	2.36	0.09	670.14	
2/5/2020 5:52	2165	2.38	0.11	670.12	
2/5/2020 10:28	2441	2.36	0.09	670.14	Break ice
2/5/2020 14:02	2655	2.37	0.1	670.13	
2/5/2020 19:40	2993	2.4	0.13	670.1	
2/5/2020 22:18	3151	2.4	0.13	670.1	
2/6/2020 2:20	3393	2.4	0.13	670.1	
2/6/2020 6:29	3642	2.41	0.14	670.09	
2/6/2020 9:36	3829	2.41	0.14	670.09	break ice
2/6/2020 13:48	4081	2.41	0.14	670.09	
2/6/2020 19:05	4398	2.41	0.14	670.09	Recovery
2/8/2020 9:50	6723	2.25	-0.02	670.25	
2/18/2020 12:00	21253	2.22	-0.05	670.28	

Appendix F

USGS Well OL-20 Water Level Data

USGS Well OL-20 Water Levels
PW-1A Pumping Test
Eagle Harbor Mine

Pumping test start =2/3/20 17:47
Pumping test stop = 2/6/20 17:47

USGS OL-20

Date and Time	Time Elapsed Since Pumping Started (min)	Water Level (ft below TOC)	Drawdown (feet)	Water Level Elevation
2/3/2020 10:00		19.71		675.29
2/3/2020 10:15		19.71		675.29
2/3/2020 10:30		19.71		675.29
2/3/2020 10:45		19.69		675.31
2/3/2020 11:00		19.67		675.33
2/3/2020 11:15		19.66		675.34
2/3/2020 11:30		19.64		675.36
2/3/2020 11:45		19.63		675.37
2/3/2020 12:00		19.61		675.39
2/3/2020 12:15		19.6		675.4
2/3/2020 12:30		19.59		675.41
2/3/2020 12:45		19.58		675.42
2/3/2020 13:00		19.57		675.43
2/3/2020 13:15		19.56		675.44
2/3/2020 13:30		19.55		675.45
2/3/2020 13:45		19.55		675.45
2/3/2020 14:00		19.54		675.46
2/3/2020 14:15		19.54		675.46
2/3/2020 14:30		19.53		675.47
2/3/2020 14:45		19.53		675.47
2/3/2020 15:00		19.53		675.47
2/3/2020 15:15		19.53		675.47
2/3/2020 15:30		19.53		675.47
2/3/2020 15:45		19.53		675.47
2/3/2020 16:00		19.53		675.47
2/3/2020 16:15		19.53		675.47
2/3/2020 16:30		19.52		675.48
2/3/2020 16:45		19.52		675.48
2/3/2020 17:00		19.52		675.48
2/3/2020 17:15		19.52		675.48
2/3/2020 17:30		19.52		675.48
2/3/2020 17:45	17:47 Test Start	19.52	0	675.48
2/3/2020 18:00	13	19.52	0	675.48
2/3/2020 18:15	28	19.52	0	675.48
2/3/2020 18:30	43	19.52	0	675.48
2/3/2020 18:45	58	19.52	0	675.48
2/3/2020 19:00	73	19.53	0.01	675.47
2/3/2020 19:15	88	19.53	0.01	675.47
2/3/2020 19:30	103	19.53	0.01	675.47

2/3/2020 19:45	118	19.54	0.02	675.46
2/3/2020 20:00	133	19.54	0.02	675.46
2/3/2020 20:15	148	19.54	0.02	675.46
2/3/2020 20:30	163	19.55	0.03	675.45
2/3/2020 20:45	178	19.55	0.03	675.45
2/3/2020 21:00	193	19.56	0.04	675.44
2/3/2020 21:15	208	19.56	0.04	675.44
2/3/2020 21:30	223	19.56	0.04	675.44
2/3/2020 21:45	238	19.56	0.04	675.44
2/3/2020 22:00	253	19.56	0.04	675.44
2/3/2020 22:15	268	19.56	0.04	675.44
2/3/2020 22:30	283	19.56	0.04	675.44
2/3/2020 22:45	298	19.56	0.04	675.44
2/3/2020 23:00	313	19.56	0.04	675.44
2/3/2020 23:15	328	19.55	0.03	675.45
2/3/2020 23:30	343	19.55	0.03	675.45
2/3/2020 23:45	358	19.55	0.03	675.45
2/4/2020 0:00	373	19.55	0.03	675.45
2/4/2020 0:15	388	19.55	0.03	675.45
2/4/2020 0:30	403	19.55	0.03	675.45
2/4/2020 0:45	418	19.54	0.02	675.46
2/4/2020 1:00	433	19.54	0.02	675.46
2/4/2020 1:15	448	19.54	0.02	675.46
2/4/2020 1:30	463	19.54	0.02	675.46
2/4/2020 1:45	478	19.54	0.02	675.46
2/4/2020 2:00	493	19.54	0.02	675.46
2/4/2020 2:15	508	19.54	0.02	675.46
2/4/2020 2:30	523	19.54	0.02	675.46
2/4/2020 2:45	538	19.54	0.02	675.46
2/4/2020 3:00	553	19.54	0.02	675.46
2/4/2020 3:15	568	19.54	0.02	675.46
2/4/2020 3:30	583	19.56	0.04	675.44
2/4/2020 3:45	598	19.58	0.06	675.42
2/4/2020 4:00	613	19.6	0.08	675.4
2/4/2020 4:15	628	19.62	0.1	675.38
2/4/2020 4:30	643	19.64	0.12	675.36
2/4/2020 4:45	658	19.66	0.14	675.34
2/4/2020 5:00	673	19.67	0.15	675.33
2/4/2020 5:15	688	19.68	0.16	675.32
2/4/2020 5:30	703	19.69	0.17	675.31
2/4/2020 5:45	718	19.7	0.18	675.3
2/4/2020 6:00	733	19.69	0.17	675.31
2/4/2020 6:15	748	19.68	0.16	675.32
2/4/2020 6:30	763	19.67	0.15	675.33
2/4/2020 6:45	778	19.66	0.14	675.34
2/4/2020 7:00	793	19.65	0.13	675.35
2/4/2020 7:15	808	19.64	0.12	675.36
2/4/2020 7:30	823	19.64	0.12	675.36

2/4/2020 7:45	838	19.63	0.11	675.37
2/4/2020 8:00	853	19.63	0.11	675.37
2/4/2020 8:15	868	19.63	0.11	675.37
2/4/2020 8:30	883	19.63	0.11	675.37
2/4/2020 8:45	898	19.63	0.11	675.37
2/4/2020 9:00	913	19.63	0.11	675.37
2/4/2020 9:15	928	19.63	0.11	675.37
2/4/2020 9:30	943	19.63	0.11	675.37
2/4/2020 9:45	958	19.62	0.1	675.38
2/4/2020 10:00	973	19.62	0.1	675.38
2/4/2020 10:15	988	19.62	0.1	675.38
2/4/2020 10:30	1003	19.62	0.1	675.38
2/4/2020 10:45	1018	19.62	0.1	675.38
2/4/2020 11:00	1033	19.62	0.1	675.38
2/4/2020 11:15	1048	19.62	0.1	675.38
2/4/2020 11:30	1063	19.62	0.1	675.38
2/4/2020 11:45	1078	19.62	0.1	675.38
2/4/2020 12:00	1093	19.61	0.09	675.39
2/4/2020 12:15	1108	19.61	0.09	675.39
2/4/2020 12:30	1123	19.61	0.09	675.39
2/4/2020 12:45	1138	19.61	0.09	675.39
2/4/2020 13:00	1153	19.61	0.09	675.39
2/4/2020 13:15	1168	19.61	0.09	675.39
2/4/2020 13:30	1183	19.61	0.09	675.39
2/4/2020 13:45	1198	19.61	0.09	675.39
2/4/2020 14:00	1213	19.61	0.09	675.39
2/4/2020 14:15	1228	19.6	0.08	675.4
2/4/2020 14:30	1243	19.6	0.08	675.4
2/4/2020 14:45	1258	19.6	0.08	675.4
2/4/2020 15:00	1273	19.6	0.08	675.4
2/4/2020 15:15	1288	19.6	0.08	675.4
2/4/2020 15:30	1303	19.61	0.09	675.39
2/4/2020 15:45	1318	19.61	0.09	675.39
2/4/2020 16:00	1333	19.61	0.09	675.39
2/4/2020 16:15	1348	19.61	0.09	675.39
2/4/2020 16:30	1363	19.61	0.09	675.39
2/4/2020 16:45	1378	19.62	0.1	675.38
2/4/2020 17:00	1393	19.62	0.1	675.38
2/4/2020 17:15	1408	19.62	0.1	675.38
2/4/2020 17:30	1423	19.62	0.1	675.38
2/4/2020 17:45	1438	19.62	0.1	675.38
2/4/2020 18:00	1453	19.63	0.11	675.37
2/4/2020 18:15	1468	19.63	0.11	675.37
2/4/2020 18:30	1483	19.63	0.11	675.37
2/4/2020 18:45	1498	19.64	0.12	675.36
2/4/2020 19:00	1513	19.64	0.12	675.36
2/4/2020 19:15	1528	19.64	0.12	675.36
2/4/2020 19:30	1543	19.64	0.12	675.36

2/4/2020 19:45	1558	19.64	0.12	675.36
2/4/2020 20:00	1573	19.64	0.12	675.36
2/4/2020 20:15	1588	19.64	0.12	675.36
2/4/2020 20:30	1603	19.64	0.12	675.36
2/4/2020 20:45	1618	19.65	0.13	675.35
2/4/2020 21:00	1633	19.65	0.13	675.35
2/4/2020 21:15	1648	19.65	0.13	675.35
2/4/2020 21:30	1663	19.65	0.13	675.35
2/4/2020 21:45	1678	19.65	0.13	675.35
2/4/2020 22:00	1693	19.65	0.13	675.35
2/4/2020 22:15	1708	19.64	0.12	675.36
2/4/2020 22:30	1723	19.64	0.12	675.36
2/4/2020 22:45	1738	19.64	0.12	675.36
2/4/2020 23:00	1753	19.64	0.12	675.36
2/4/2020 23:15	1768	19.63	0.11	675.37
2/4/2020 23:30	1783	19.63	0.11	675.37
2/4/2020 23:45	1798	19.63	0.11	675.37
2/5/2020 0:00	1813	19.63	0.11	675.37
2/5/2020 0:15	1828	19.63	0.11	675.37
2/5/2020 0:30	1843	19.63	0.11	675.37
2/5/2020 0:45	1858	19.63	0.11	675.37
2/5/2020 1:00	1873	19.63	0.11	675.37
2/5/2020 1:15	1888	19.63	0.11	675.37
2/5/2020 1:30	1903	19.63	0.11	675.37
2/5/2020 1:45	1918	19.63	0.11	675.37
2/5/2020 2:00	1933	19.63	0.11	675.37
2/5/2020 2:15	1948	19.63	0.11	675.37
2/5/2020 2:30	1963	19.63	0.11	675.37
2/5/2020 2:45	1978	19.63	0.11	675.37
2/5/2020 3:00	1993	19.63	0.11	675.37
2/5/2020 3:15	2008	19.63	0.11	675.37
2/5/2020 3:30	2023	19.63	0.11	675.37
2/5/2020 3:45	2038	19.64	0.12	675.36
2/5/2020 4:00	2053	19.64	0.12	675.36
2/5/2020 4:15	2068	19.64	0.12	675.36
2/5/2020 4:30	2083	19.64	0.12	675.36
2/5/2020 4:45	2098	19.64	0.12	675.36
2/5/2020 5:00	2113	19.64	0.12	675.36
2/5/2020 5:15	2128	19.65	0.13	675.35
2/5/2020 5:30	2143	19.65	0.13	675.35
2/5/2020 5:45	2158	19.65	0.13	675.35
2/5/2020 6:00	2173	19.65	0.13	675.35
2/5/2020 6:15	2188	19.65	0.13	675.35
2/5/2020 6:30	2203	19.66	0.14	675.34
2/5/2020 6:45	2218	19.66	0.14	675.34
2/5/2020 7:00	2233	19.66	0.14	675.34
2/5/2020 7:15	2248	19.67	0.15	675.33
2/5/2020 7:30	2263	19.67	0.15	675.33

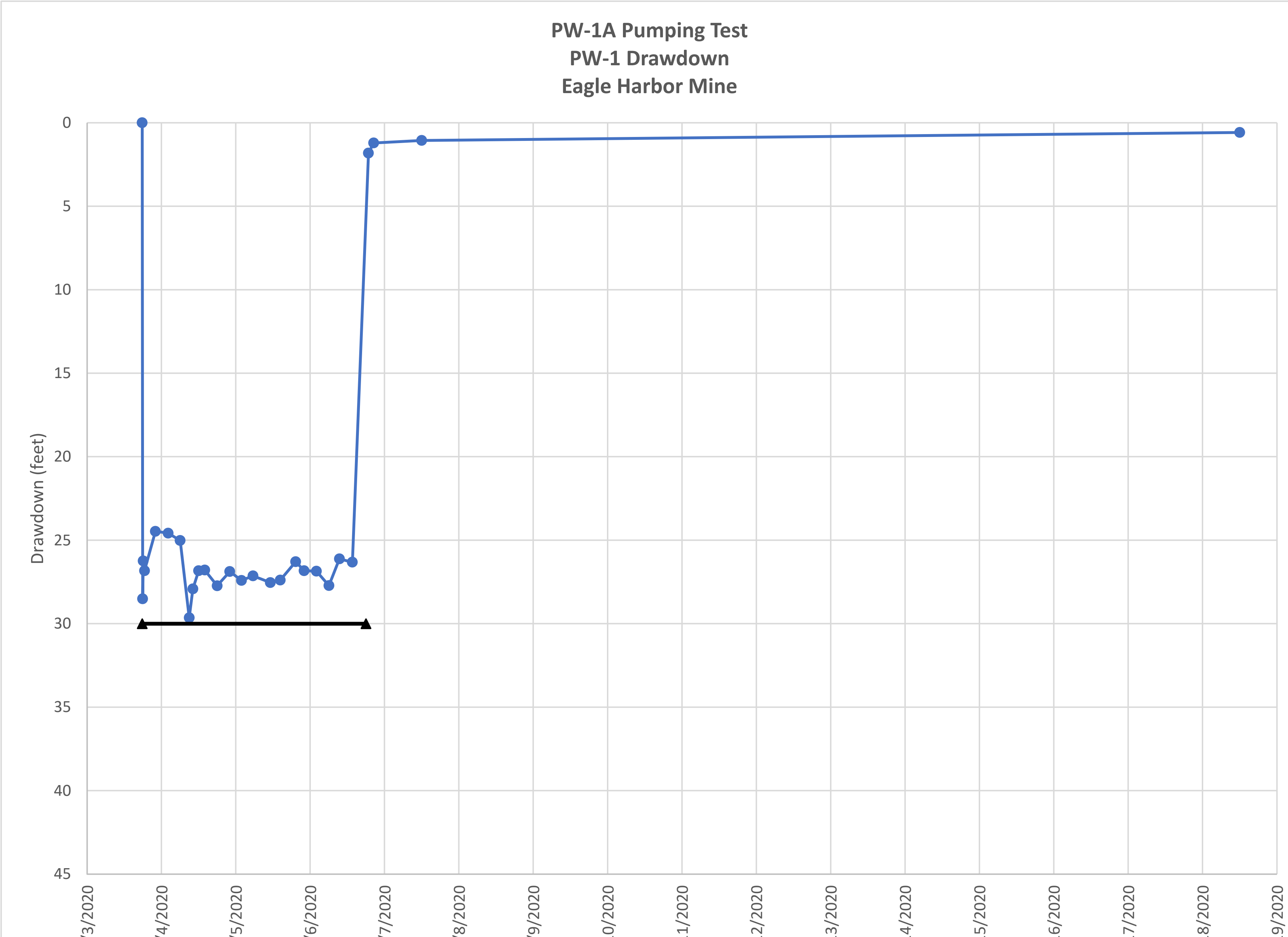
2/5/2020 7:45	2278	19.67	0.15	675.33
2/5/2020 8:00	2293	19.67	0.15	675.33
2/5/2020 8:15	2308	19.67	0.15	675.33
2/5/2020 8:30	2323	19.67	0.15	675.33
2/5/2020 8:45	2338	19.67	0.15	675.33
2/5/2020 9:00	2353	19.67	0.15	675.33
2/5/2020 9:15	2368	19.67	0.15	675.33
2/5/2020 9:30	2383	19.67	0.15	675.33
2/5/2020 9:45	2398	19.67	0.15	675.33
2/5/2020 10:00	2413	19.67	0.15	675.33
2/5/2020 10:15	2428	19.67	0.15	675.33
2/5/2020 10:30	2443	19.67	0.15	675.33
2/5/2020 10:45	2458	19.67	0.15	675.33
2/5/2020 11:00	2473	19.67	0.15	675.33
2/5/2020 11:15	2488	19.67	0.15	675.33
2/5/2020 11:30	2503	19.67	0.15	675.33
2/5/2020 11:45	2518	19.66	0.14	675.34
2/5/2020 12:00	2533	19.66	0.14	675.34
2/5/2020 12:15	2548	19.66	0.14	675.34
2/5/2020 12:30	2563	19.66	0.14	675.34
2/5/2020 12:45	2578	19.65	0.13	675.35
2/5/2020 13:00	2593	19.65	0.13	675.35
2/5/2020 13:15	2608	19.65	0.13	675.35
2/5/2020 13:30	2623	19.64	0.12	675.36
2/5/2020 13:45	2638	19.64	0.12	675.36
2/5/2020 14:00	2653	19.64	0.12	675.36
2/5/2020 14:15	2668	19.63	0.11	675.37
2/5/2020 14:30	2683	19.63	0.11	675.37
2/5/2020 14:45	2698	19.63	0.11	675.37
2/5/2020 15:00	2713	19.63	0.11	675.37
2/5/2020 15:15	2728	19.63	0.11	675.37
2/5/2020 15:30	2743	19.63	0.11	675.37
2/5/2020 15:45	2758	19.63	0.11	675.37
2/5/2020 16:00	2773	19.62	0.1	675.38
2/5/2020 16:15	2788	19.63	0.11	675.37
2/5/2020 16:30	2803	19.62	0.1	675.38
2/5/2020 16:45	2818	19.62	0.1	675.38
2/5/2020 17:00	2833	19.62	0.1	675.38
2/5/2020 17:15	2848	19.62	0.1	675.38
2/5/2020 17:30	2863	19.62	0.1	675.38
2/5/2020 17:45	2878	19.62	0.1	675.38
2/5/2020 18:00	2893	19.62	0.1	675.38
2/5/2020 18:15	2908	19.62	0.1	675.38

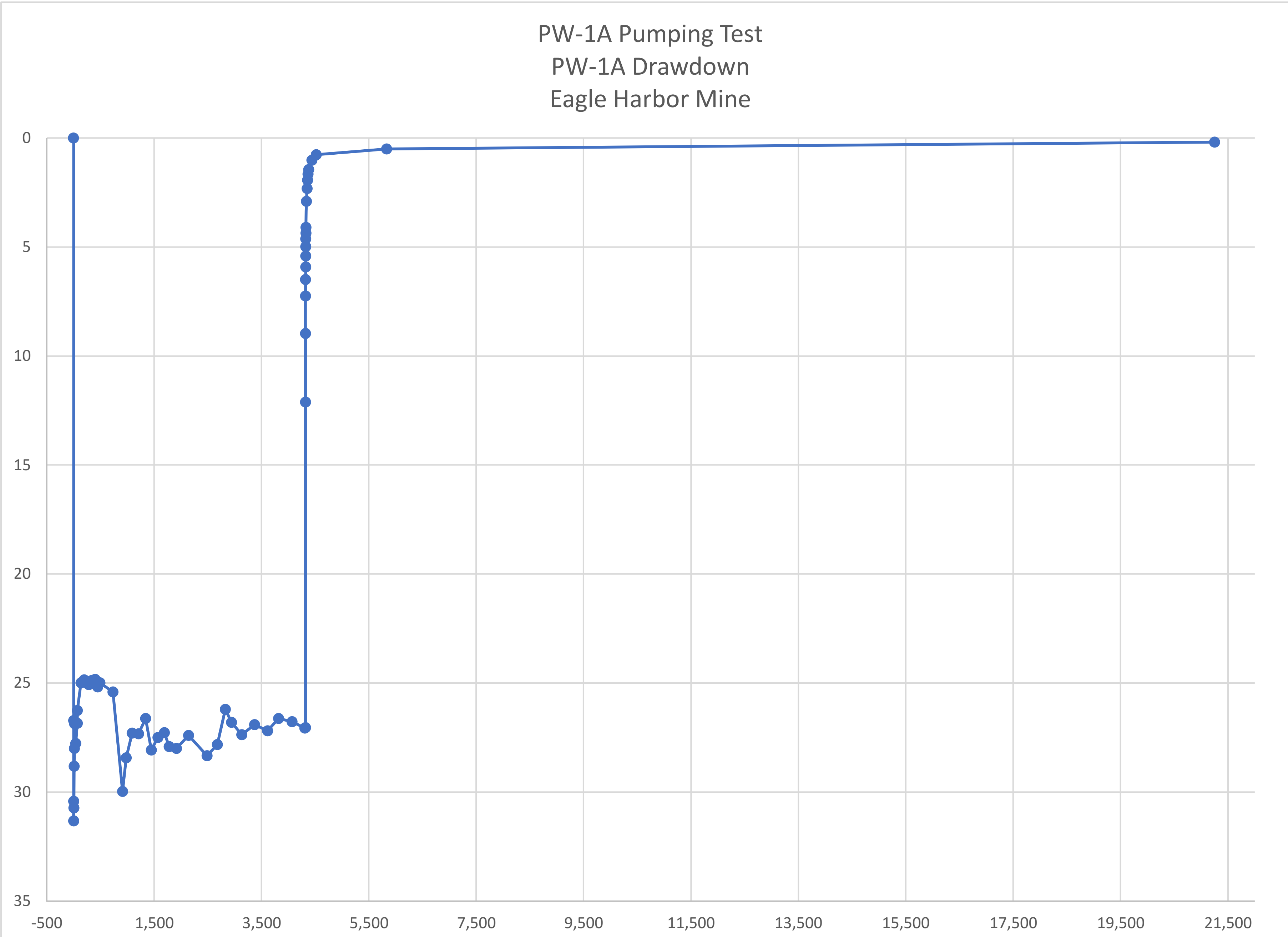
2/5/2020 18:30	2923	19.63	0.11	675.37
2/5/2020 18:45	2938	19.63	0.11	675.37
2/5/2020 19:00	2953	19.63	0.11	675.37
2/5/2020 19:15	2968	19.63	0.11	675.37
2/5/2020 19:30	2983	19.62	0.1	675.38
2/5/2020 19:45	2998	19.62	0.1	675.38
2/5/2020 20:00	3013	19.63	0.11	675.37
2/5/2020 20:15	3028	19.62	0.1	675.38
2/5/2020 20:30	3043	19.62	0.1	675.38
2/5/2020 20:45	3058	19.61	0.09	675.39
2/5/2020 21:00	3073	19.61	0.09	675.39
2/5/2020 21:15	3088	19.61	0.09	675.39
2/5/2020 21:30	3103	19.61	0.09	675.39
2/5/2020 21:45	3118	19.6	0.08	675.4
2/5/2020 22:00	3133	19.6	0.08	675.4
2/5/2020 22:15	3148	19.59	0.07	675.41
2/5/2020 22:30	3163	19.59	0.07	675.41
2/5/2020 22:45	3178	19.58	0.06	675.42
2/5/2020 23:00	3193	19.58	0.06	675.42
2/5/2020 23:15	3208	19.57	0.05	675.43
2/5/2020 23:30	3223	19.57	0.05	675.43
2/5/2020 23:45	3238	19.57	0.05	675.43
2/6/2020 0:00	3253	19.56	0.04	675.44
2/6/2020 0:15	3268	19.56	0.04	675.44
2/6/2020 0:30	3283	19.55	0.03	675.45
2/6/2020 0:45	3298	19.55	0.03	675.45
2/6/2020 1:00	3313	19.54	0.02	675.46
2/6/2020 1:15	3328	19.53	0.01	675.47
2/6/2020 1:30	3343	19.53	0.01	675.47
2/6/2020 1:45	3358	19.53	0.01	675.47
2/6/2020 2:00	3373	19.53	0.01	675.47
2/6/2020 2:15	3388	19.53	0.01	675.47
2/6/2020 2:30	3403	19.53	0.01	675.47
2/6/2020 2:45	3418	19.52	0	675.48
2/6/2020 3:00	3433	19.52	0	675.48
2/6/2020 3:15	3448	19.53	0.01	675.47
2/6/2020 3:30	3463	19.53	0.01	675.47
2/6/2020 3:45	3478	19.53	0.01	675.47
2/6/2020 4:00	3493	19.53	0.01	675.47
2/6/2020 4:15	3508	19.53	0.01	675.47
2/6/2020 4:30	3523	19.53	0.01	675.47
2/6/2020 4:45	3538	19.53	0.01	675.47
2/6/2020 5:00	3553	19.53	0.01	675.47
2/6/2020 5:15	3568	19.53	0.01	675.47
2/6/2020 5:30	3583	19.53	0.01	675.47
2/6/2020 5:45	3598	19.53	0.01	675.47
2/6/2020 6:00	3613	19.53	0.01	675.47
2/6/2020 6:15	3628	19.53	0.01	675.47

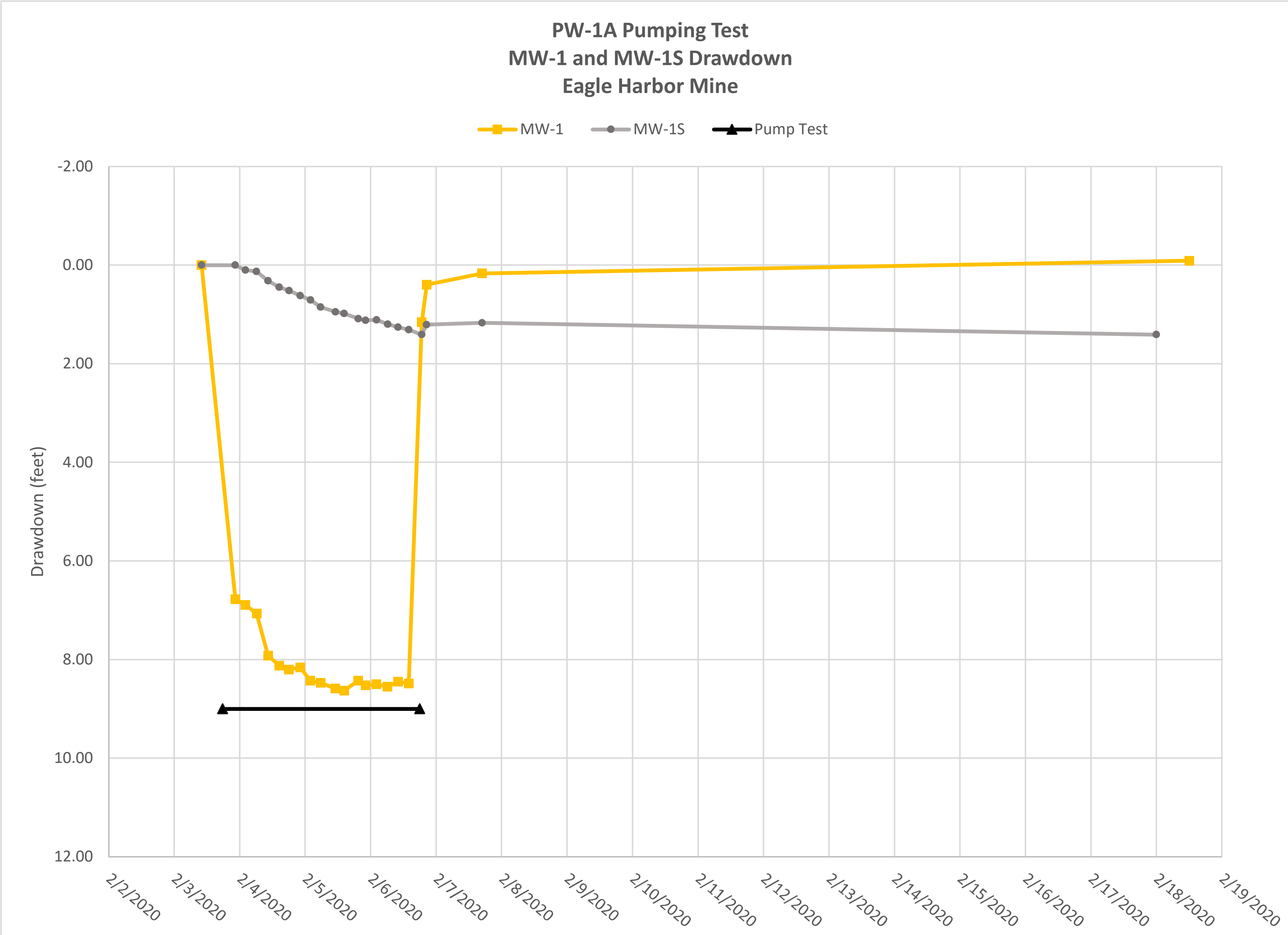
2/6/2020 6:30	3643	19.54	0.02	675.46
2/6/2020 6:45	3658	19.54	0.02	675.46
2/6/2020 7:00	3673	19.54	0.02	675.46
2/6/2020 7:15	3688	19.54	0.02	675.46
2/6/2020 7:30	3703	19.54	0.02	675.46
2/6/2020 7:45	3718	19.54	0.02	675.46
2/6/2020 8:00	3733	19.54	0.02	675.46
2/6/2020 8:15	3748	19.54	0.02	675.46
2/6/2020 8:30	3763	19.54	0.02	675.46
2/6/2020 8:45	3778	19.54	0.02	675.46
2/6/2020 9:00	3793	19.54	0.02	675.46
2/6/2020 9:15	3808	19.54	0.02	675.46
2/6/2020 9:30	3823	19.54	0.02	675.46
2/6/2020 9:45	3838	19.54	0.02	675.46
2/6/2020 10:00	3853	19.54	0.02	675.46
2/6/2020 10:15	3868	19.54	0.02	675.46
2/6/2020 10:30	3883	19.54	0.02	675.46
2/6/2020 10:45	3898	19.54	0.02	675.46
2/6/2020 11:00	3913	19.54	0.02	675.46
2/6/2020 11:15	3928	19.54	0.02	675.46
2/6/2020 11:30	3943	19.54	0.02	675.46
2/6/2020 11:45	3958	19.54	0.02	675.46
2/6/2020 12:00	3973	19.54	0.02	675.46
2/6/2020 12:15	3988	19.54	0.02	675.46
2/6/2020 12:30	4003	19.54	0.02	675.46
2/6/2020 12:45	4018	19.54	0.02	675.46
2/6/2020 13:00	4033	19.54	0.02	675.46
2/6/2020 13:15	4048	19.54	0.02	675.46
2/6/2020 13:30	4063	19.54	0.02	675.46
2/6/2020 13:45	4078	19.54	0.02	675.46
2/6/2020 14:00	4093	19.53	0.01	675.47
2/6/2020 14:15	4108	19.53	0.01	675.47
2/6/2020 14:30	4123	19.53	0.01	675.47
2/6/2020 14:45	4138	19.54	0.02	675.46
2/6/2020 15:00	4153	19.54	0.02	675.46
2/6/2020 15:15	4168	19.53	0.01	675.47
2/6/2020 15:30	4183	19.53	0.01	675.47
2/6/2020 15:45	4198	19.53	0.01	675.47
2/6/2020 16:00	4213	19.53	0.01	675.47
2/6/2020 16:15	4228	19.52	0	675.48
2/6/2020 16:30	4243	19.53	0.01	675.47
2/6/2020 16:45	4258	19.53	0.01	675.47
2/6/2020 17:00	4273	19.53	0.01	675.47
2/6/2020 17:15	4288	19.53	0.01	675.47
2/6/2020 17:30	4303	19.54	0.02	675.46
2/6/2020 17:45	4318	19.54	0.02	675.46
2/6/2020 18:00	17:47 Test Stop	19.54		675.46

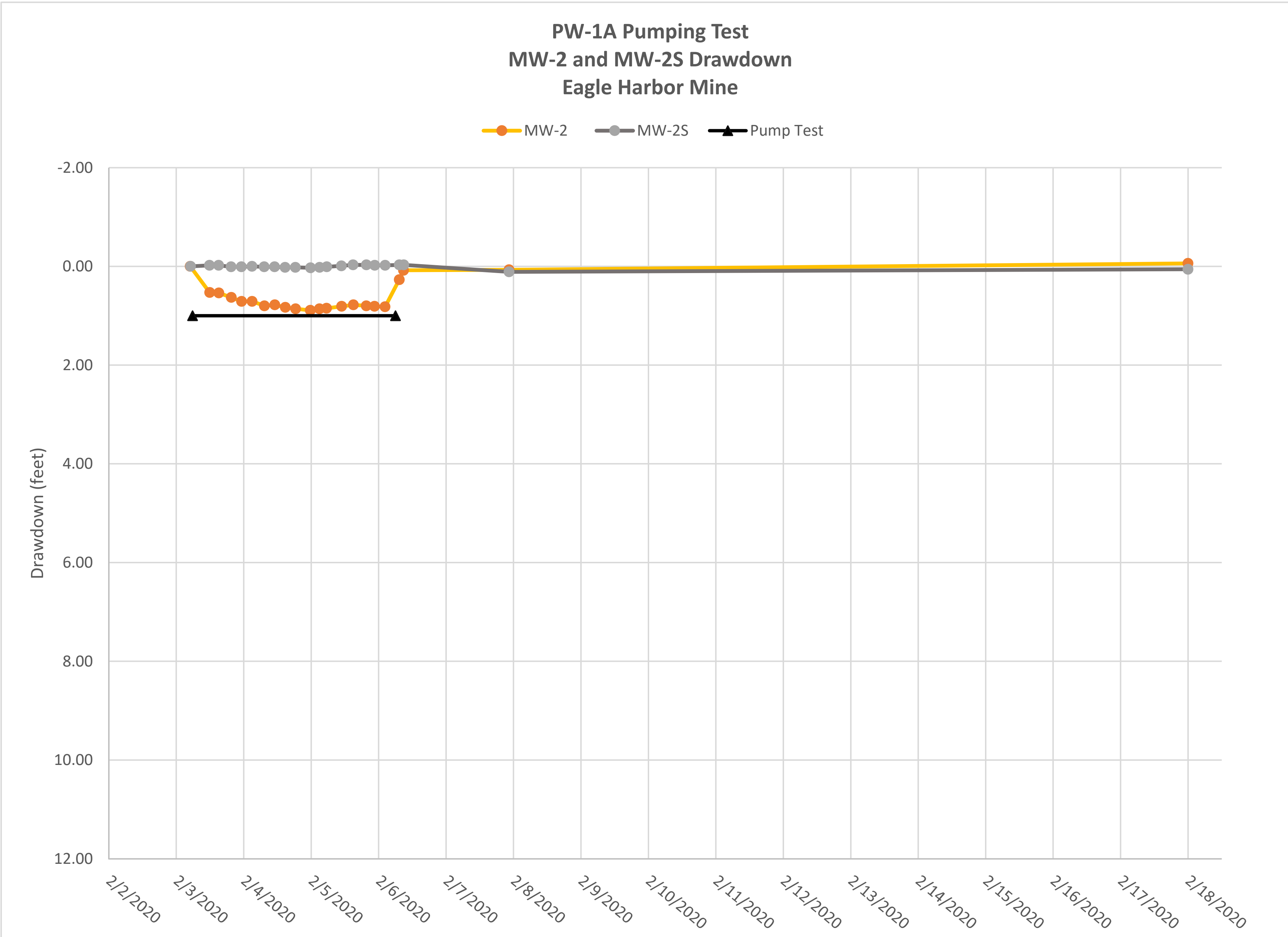
2/6/2020 18:15	19.55	675.45
2/6/2020 18:30	19.55	675.45
2/6/2020 18:45	19.55	675.45
2/6/2020 19:00	19.55	675.45
2/6/2020 19:15	19.55	675.45
2/6/2020 19:30	19.54	675.46
2/6/2020 19:45	19.54	675.46
2/6/2020 20:00	19.52	675.48
2/6/2020 20:15	19.52	675.48
2/6/2020 20:30	19.51	675.49
2/6/2020 20:45	19.5	675.5
2/6/2020 21:00	19.49	675.51
2/6/2020 21:15	19.48	675.52
2/6/2020 21:30	19.47	675.53
2/6/2020 21:45	19.47	675.53
2/6/2020 22:00	19.46	675.54
2/6/2020 22:15	19.46	675.54
2/6/2020 22:30	19.45	675.55
2/6/2020 22:45	19.44	675.56
2/6/2020 23:00	19.44	675.56
2/6/2020 23:15	19.43	675.57
2/6/2020 23:30	19.42	675.58
2/6/2020 23:45	19.42	675.58
2/7/2020 0:00	19.41	675.59
2/7/2020 0:15	19.41	675.59
2/7/2020 0:30	19.41	675.59
2/7/2020 0:45	19.41	675.59
2/7/2020 1:00	19.41	675.59
2/7/2020 1:15	19.41	675.59
2/7/2020 1:30	19.4	675.6
2/7/2020 1:45	19.4	675.6
2/7/2020 2:00	19.4	675.6
2/7/2020 2:15	19.39	675.61
2/7/2020 2:30	19.39	675.61
2/7/2020 2:45	19.39	675.61
2/7/2020 3:00	19.39	675.61
2/7/2020 3:15	19.39	675.61
2/7/2020 3:30	19.39	675.61
2/7/2020 3:45	19.39	675.61
2/7/2020 4:00	19.39	675.61
2/7/2020 4:15	19.39	675.61
2/7/2020 4:30	19.39	675.61
2/7/2020 4:45	19.39	675.61
2/7/2020 5:00	19.38	675.62
2/7/2020 5:15	19.38	675.62
2/7/2020 5:30	19.38	675.62
2/7/2020 5:45	19.38	675.62
2/7/2020 6:00	19.38	675.62

Appendix G
Hydrographs

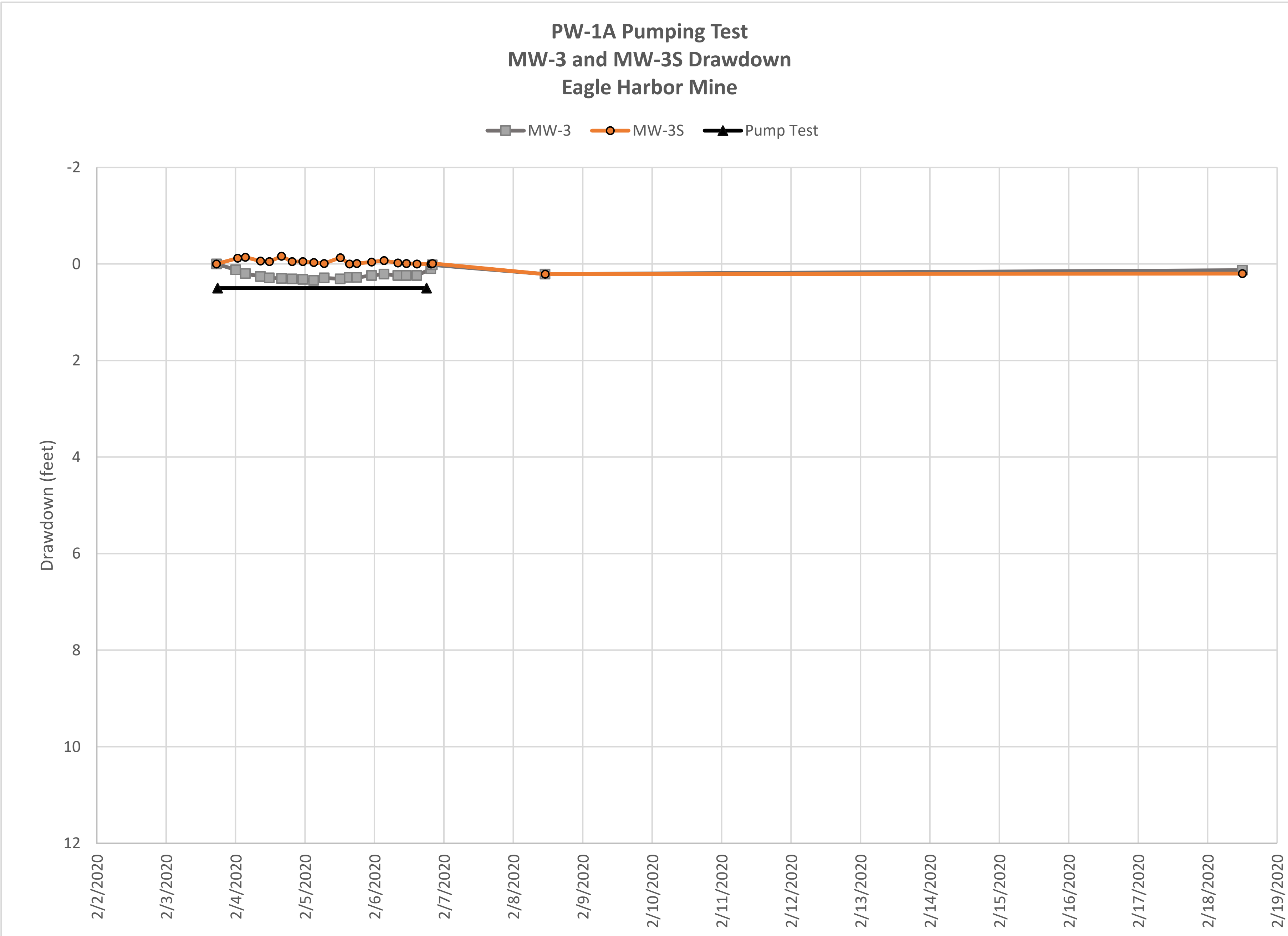

PW-1A Pumping Test
PW-1 Drawdown
Eagle Harbor Mine
Drawdown (feet)
0
5
10
15
20
25
30
35
40
45
/3/2020
/4/2020
/5/2020
/6/2020
/7/2020
/8/2020
/9/2020
10/2020
11/2020
12/2020
13/2020
14/2020
15/2020
16/2020
17/2020
18/2020
19/2020


PW-1A Pumping Test
PW-1A Drawdown
Eagle Harbor Mine
0
5
10
15
20
25
30
35
-500
1,500
3,500
5,500
7,500
9,500
11,500
13,500
15,500
17,500
19,500
21,500

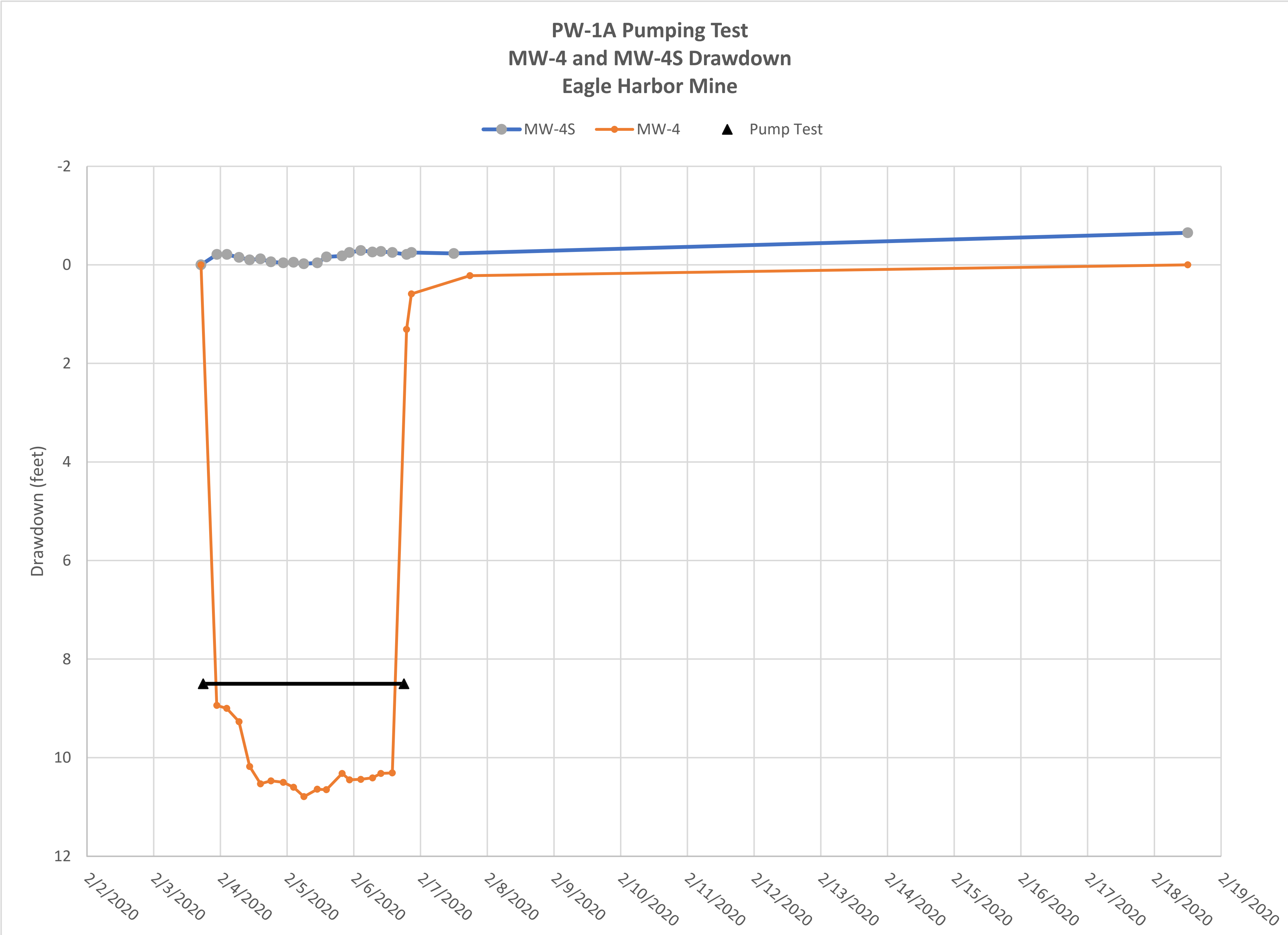

PW-1A Pumping Test
MW-1 and MW-1S Drawdown
Eagle Harbor Mine
MW-1
MW-1S
Pump Test
Drawdown (feet)
-2.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
2/2/2020
2/3/2020
2/4/2020
2/5/2020
2/6/2020
2/7/2020
2/8/2020
2/9/2020
2/10/2020
2/11/2020
2/12/2020
2/13/2020
2/14/2020
2/15/2020
2/16/2020
2/17/2020
2/18/2020
2/19/2020

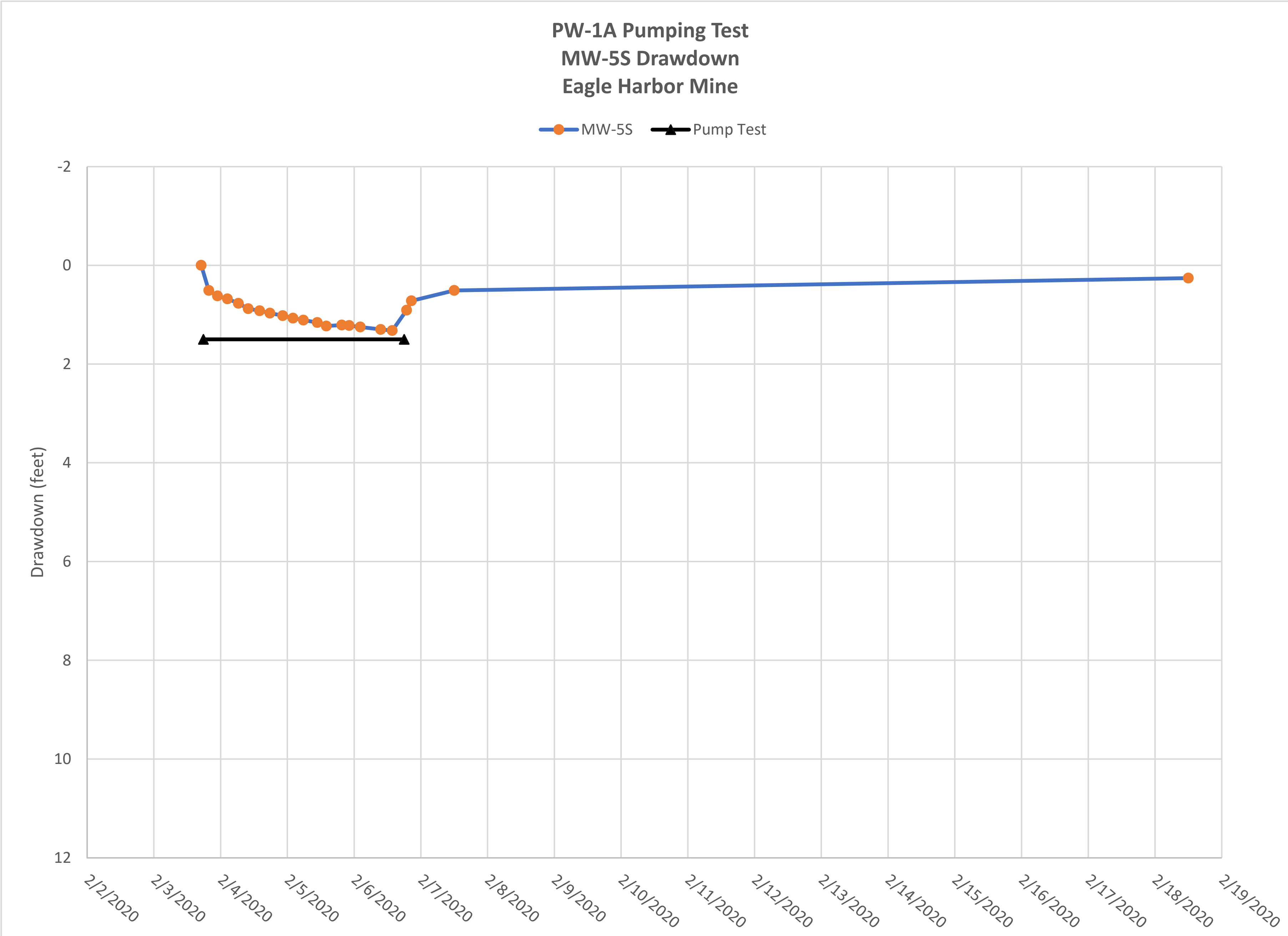


PW-1A Pumping Test
MW-2 and MW-2S Drawdown
Eagle Harbor Mine
MW-2
MW-2S
Pump Test
Drawdown (feet)
-2.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
2/2/2020
2/3/2020
2/4/2020
2/5/2020
2/6/2020
2/7/2020
2/8/2020
2/9/2020
2/10/2020
2/11/2020
2/12/2020
2/13/2020
2/14/2020
2/15/2020
2/16/2020
2/17/2020
2/18/2020

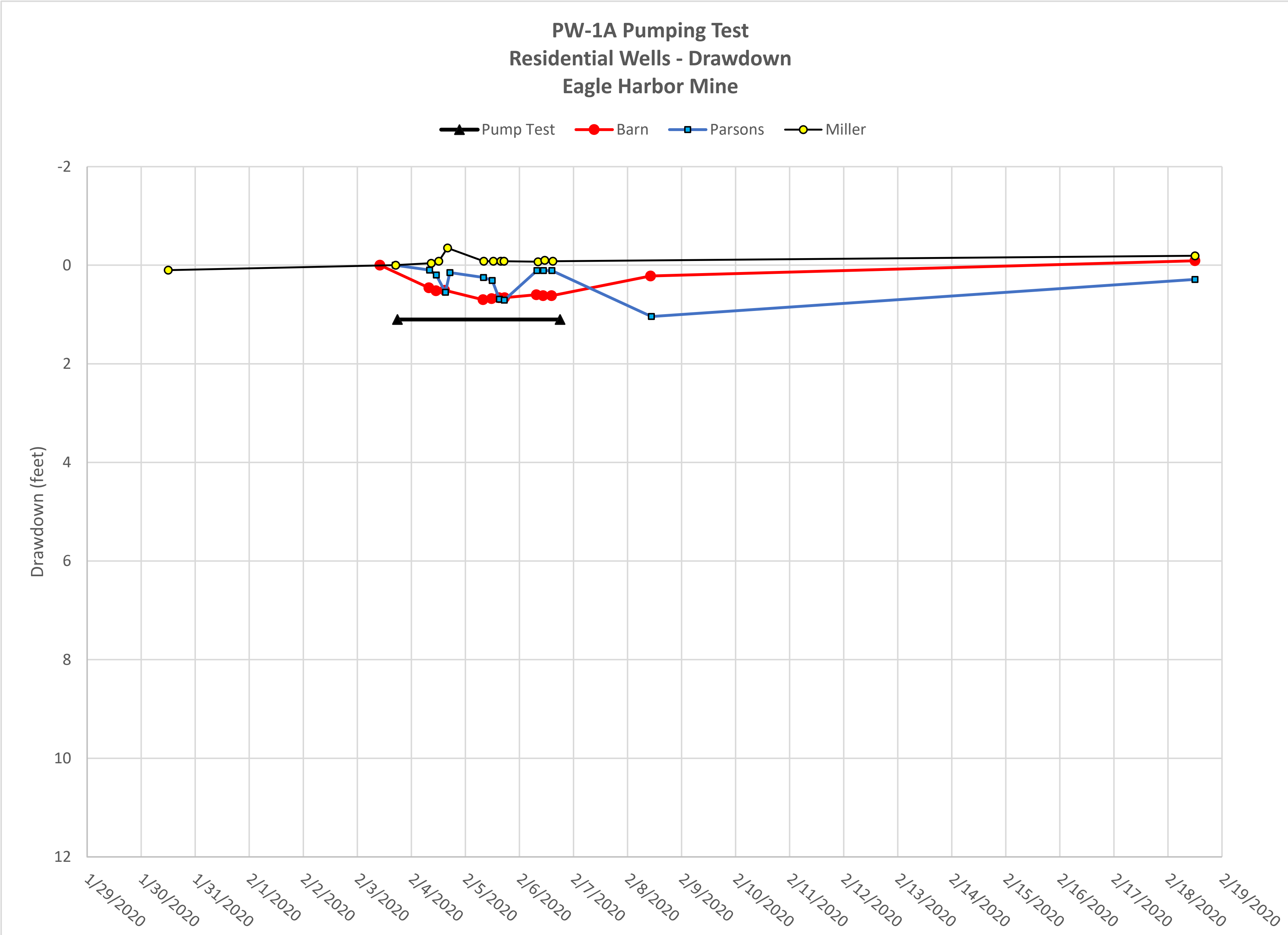


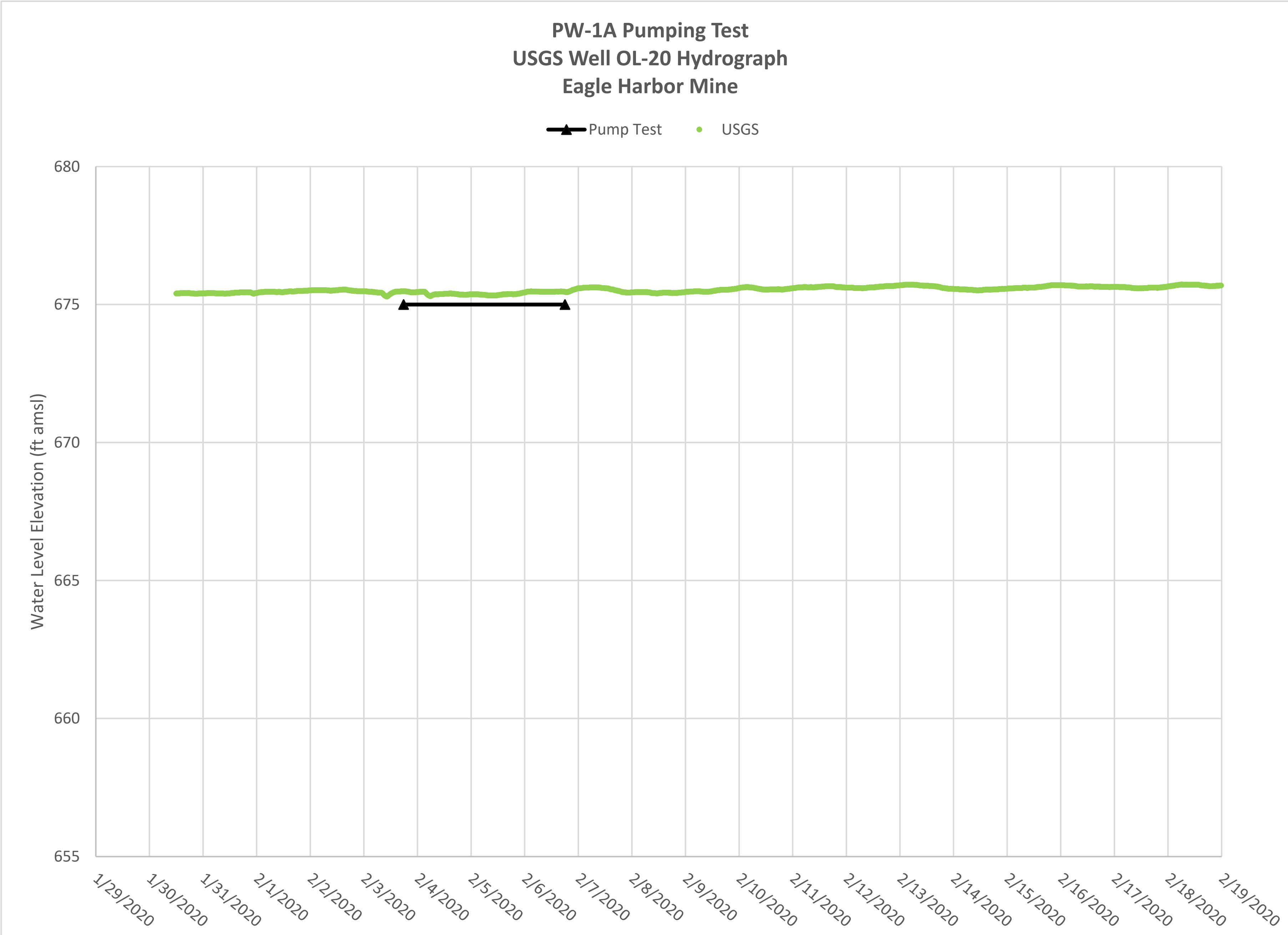
PW-1A Pumping Test
MW-3 and MW-3S Drawdown
Eagle Harbor Mine
MW-3
MW-3S
Pump Test
Drawdown (feet)
-2
0
2
4
6
8
10
12
2/2/2020
2/3/2020
2/4/2020
2/5/2020
2/6/2020
2/7/2020
2/8/2020
2/9/2020
2/10/2020
2/11/2020
2/12/2020
2/13/2020
2/14/2020
2/15/2020
2/16/2020
2/17/2020
2/18/2020
2/19/2020


PW-1A Pumping Test
MW-4 and MW-4S Drawdown
Eagle Harbor Mine
MW-4S
MW-4
Pump Test
Drawdown (feet)
-2
0
2
4
6
8
10
12
2/2/2020
2/3/2020
2/4/2020
2/5/2020
2/6/2020
2/7/2020
2/8/2020
2/9/2020
2/10/2020
2/11/2020
2/12/2020
2/13/2020
2/14/2020
2/15/2020
2/16/2020
2/17/2020
2/18/2020
2/19/2020

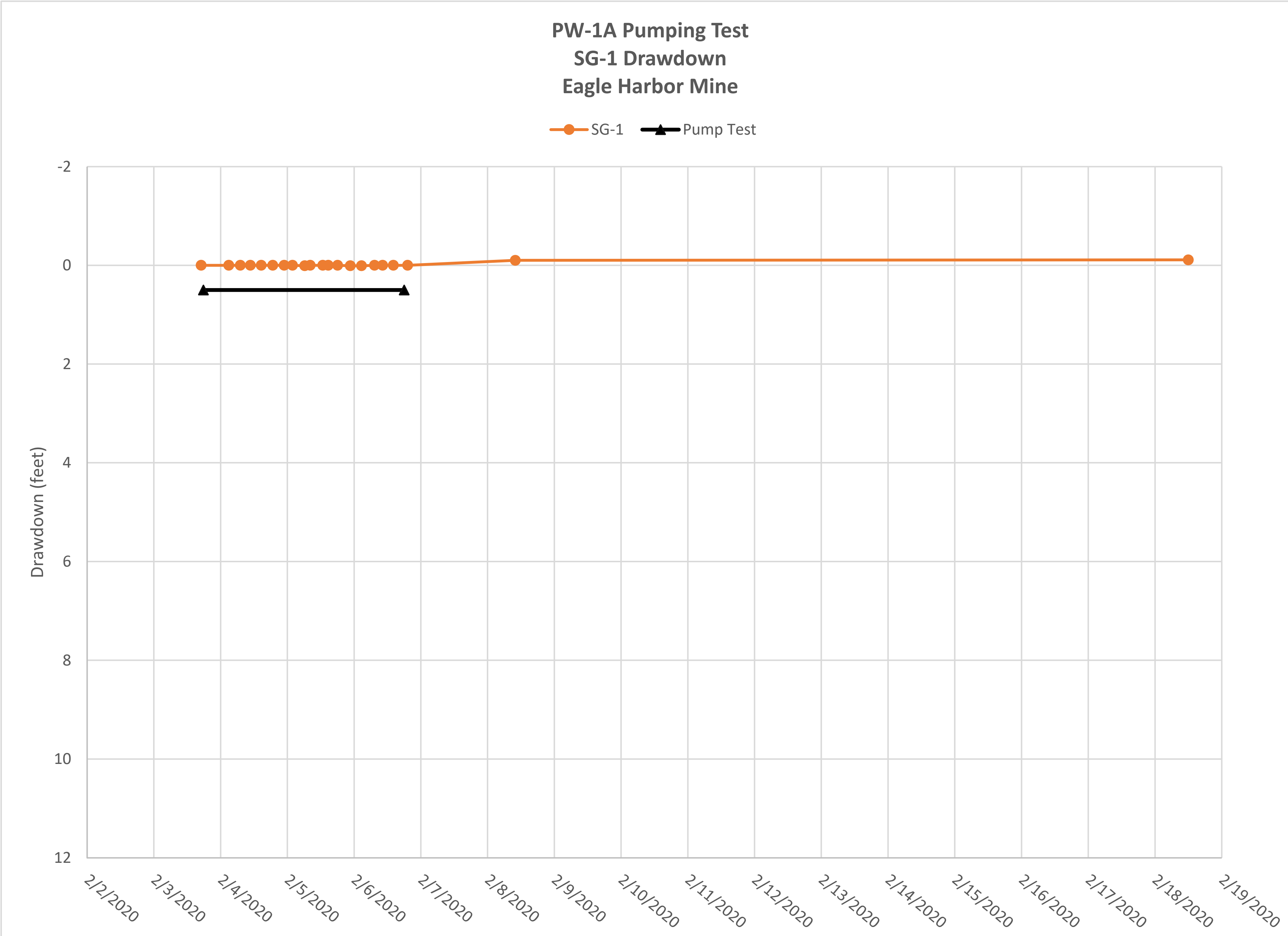


PW-1A Pumping Test
MW-5S Drawdown
Eagle Harbor Mine
MW-5S
Pump Test
Drawdown (feet)
-2
0
2
4
6
8
10
12
2/2/2020
2/3/2020
2/4/2020
2/5/2020
2/6/2020
2/7/2020
2/8/2020
2/9/2020
2/10/2020
2/11/2020
2/12/2020
2/13/2020
2/14/2020
2/15/2020
2/16/2020
2/17/2020
2/18/2020
2/19/2020

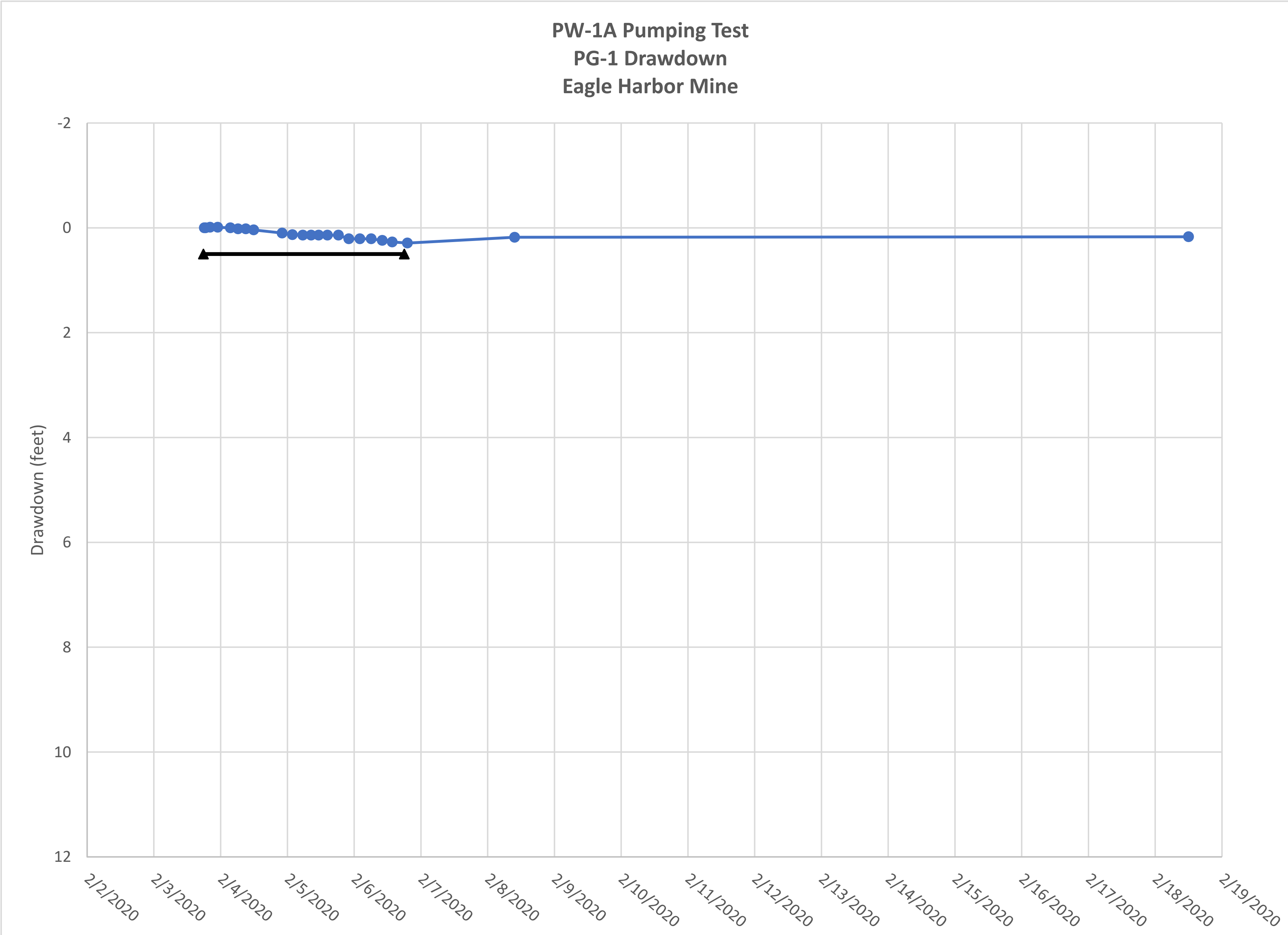

PW-1A Pumping Test
Residential Wells - Drawdown
Eagle Harbor Mine
Pump Test
Barn
Parsons
Miller
Drawdown (feet)
-2
0
2
4
6
8
10
12
1/29/2020
1/30/2020
1/31/2020
2/1/2020
2/2/2020
2/3/2020
2/4/2020
2/5/2020
2/6/2020
2/7/2020
2/8/2020
2/9/2020
2/10/2020
2/11/2020
2/12/2020
2/13/2020
2/14/2020
2/15/2020
2/16/2020
2/17/2020
2/18/2020
2/19/2020

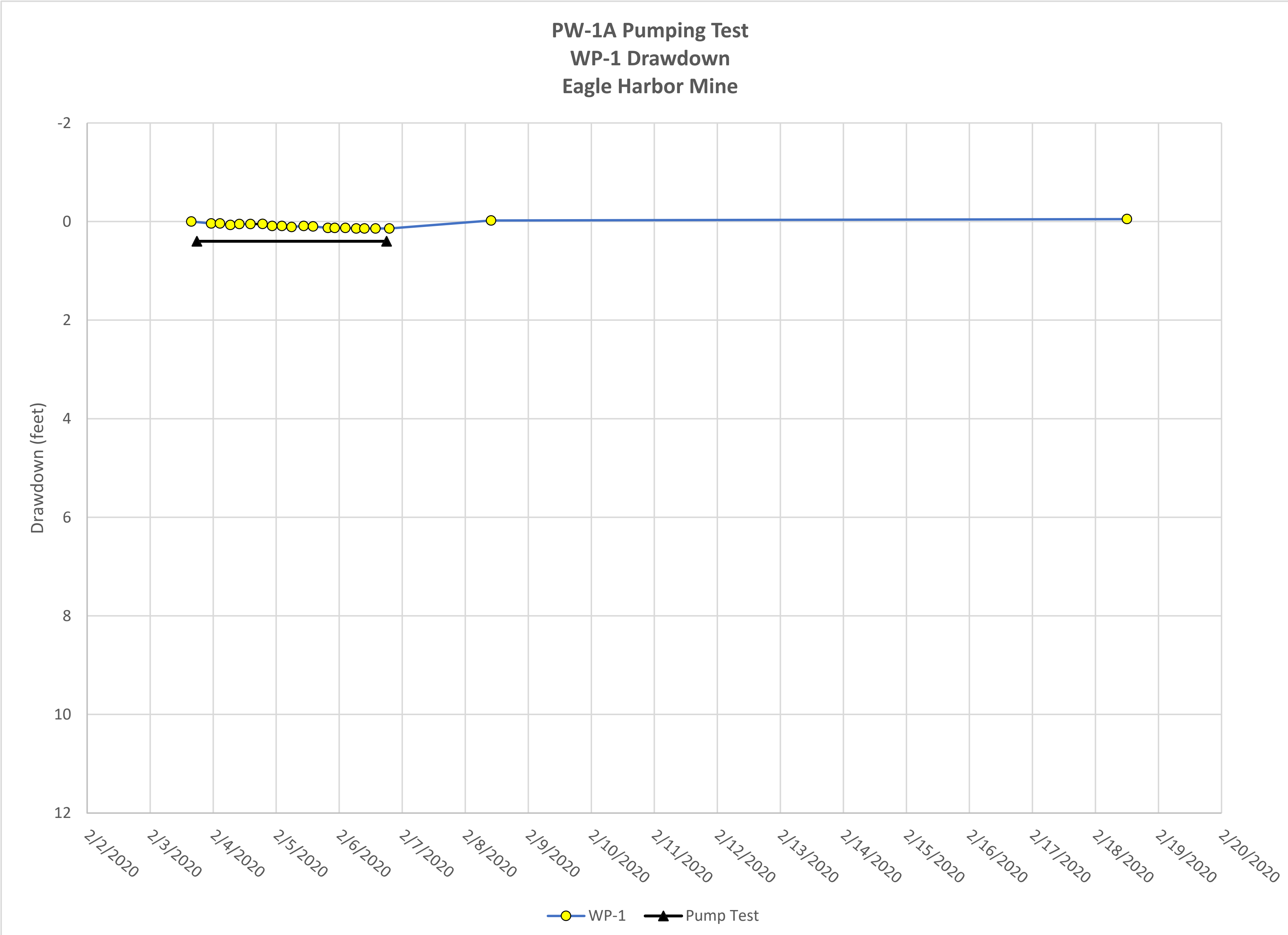


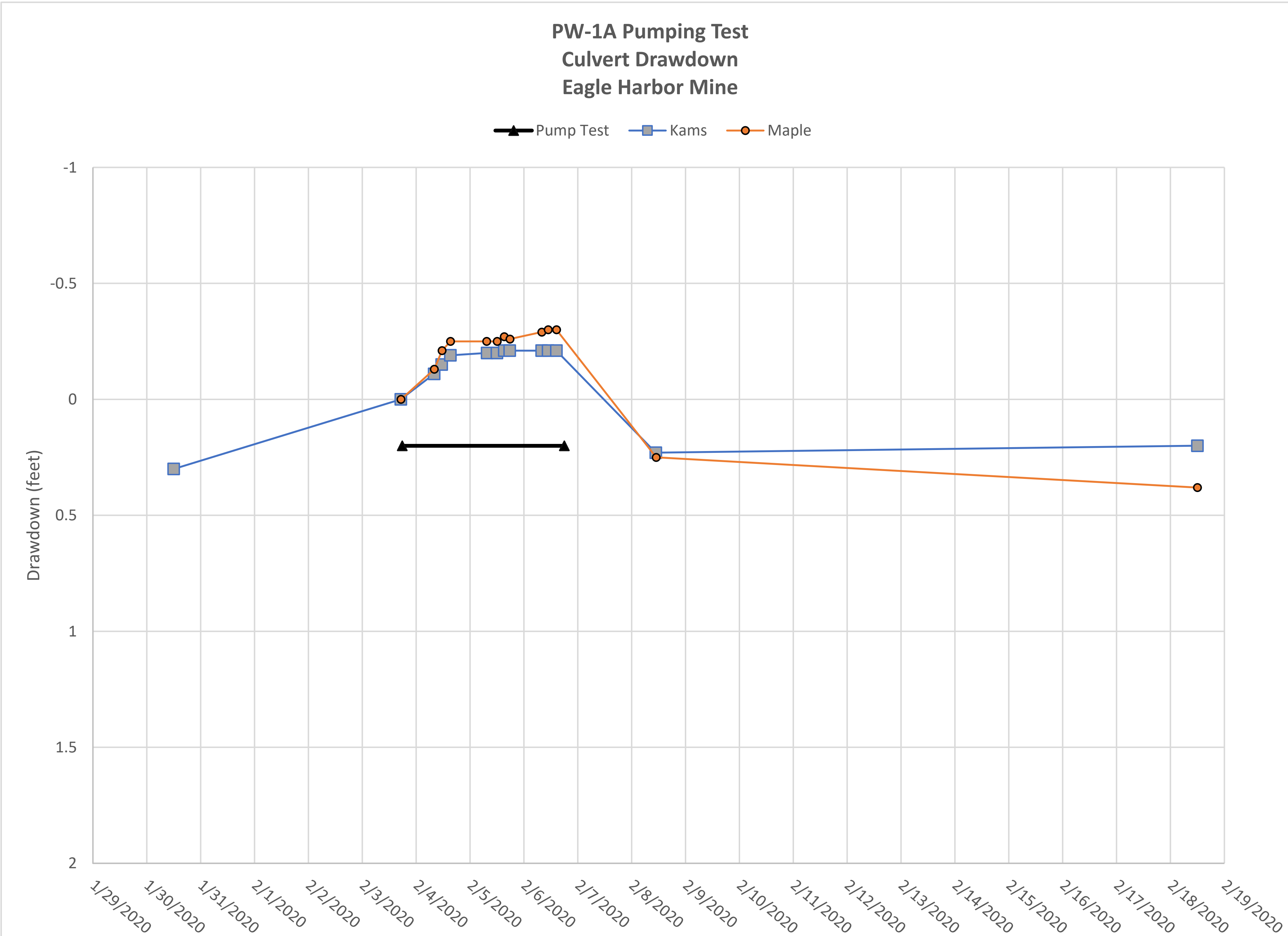
PW-1A Pumping Test
USGS Well OL-20 Hydrograph
Eagle Harbor Mine
Pump Test
USGS
Water Level Elevation (ft amsl)
680
675
670
665
660
655
1/29/2020
1/30/2020
1/31/2020
2/1/2020
2/2/2020
2/3/2020
2/4/2020
2/5/2020
2/6/2020
2/7/2020
2/8/2020
2/9/2020
2/10/2020
2/11/2020
2/12/2020
2/13/2020
2/14/2020
2/15/2020
2/16/2020
2/17/2020
2/18/2020
2/19/2020



PW-1A Pumping Test
SG-1 Drawdown
Eagle Harbor Mine
SG-1
Pump Test
Drawdown (feet)
-2
0
2
4
6
8
10
12
2/2/2020
2/3/2020
2/4/2020
2/5/2020
2/6/2020
2/7/2020
2/8/2020
2/9/2020
2/10/2020
2/11/2020
2/12/2020
2/13/2020
2/14/2020
2/15/2020
2/16/2020
2/17/2020
2/18/2020
2/19/2020


PW-1A Pumping Test
PG-1 Drawdown
Eagle Harbor Mine
Drawdown (feet)
-2
0
2
4
6
8
10
12
2/2/2020
2/3/2020
2/4/2020
2/5/2020
2/6/2020
2/7/2020
2/8/2020
2/9/2020
2/10/2020
2/11/2020
2/12/2020
2/13/2020
2/14/2020
2/15/2020
2/16/2020
2/17/2020
2/18/2020
2/19/2020


PW-1A Pumping Test
WP-1 Drawdown
Eagle Harbor Mine
Drawdown (feet)
-2
0
2
4
6
8
10
12
2/2/2020
2/3/2020
2/4/2020
2/5/2020
2/6/2020
2/7/2020
2/8/2020
2/9/2020
2/10/2020
2/11/2020
2/12/2020
2/13/2020
2/14/2020
2/15/2020
2/16/2020
2/17/2020
2/18/2020
2/19/2020
2/20/2020
WP-1
Pump Test


PW-1A Pumping Test
Culvert Drawdown
Eagle Harbor Mine
Pump Test
Kams
Maple
Drawdown (feet)
-1
-0.5
0
0.5
1
1.5
2
1/29/2020
1/30/2020
1/31/2020
2/1/2020
2/2/2020
2/3/2020
2/4/2020
2/5/2020
2/6/2020
2/7/2020
2/8/2020
2/9/2020
2/10/2020
2/11/2020
2/12/2020
2/13/2020
2/14/2020
2/15/2020
2/16/2020
2/17/2020
2/18/2020
2/19/2020

Appendix H

ALS Environmental Laboratory Report for PW-1A Water Sample

February 28, 2020

Service Request No:R2001189

Mr. Fran Connor
Test Assured Network
204 Talmadge Hill West
Waverly, NY 14892

Laboratory Results for: Eagle Harbor Sand and Gravel

Dear Mr.Connor,

Enclosed are the results of the sample(s) submitted to our laboratory February 10, 2020
For your reference, these analyses have been assigned our service request number **R2001189.**

All testing was performed according to our laboratory's quality assurance program and met the requirements of the TNI standards except as noted in the case narrative report. Any testing not included in the lab's accreditation is identified on a Non-Certified Analytes report. All results are intended to be considered in their entirety. ALS Environmental is not responsible for use of less than the complete report. Results apply only to the individual samples submitted to the lab for analysis, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s), and represented by Laboratory Control Sample control limits. Any events, such as QC failures or Holding Time exceedances, which may add to the uncertainty are explained in the report narrative or are flagged with qualifiers. The flags are explained in the Report Qualifiers and Definitions page of this report.

Please contact me if you have any questions. My extension is 7475. You may also contact me via email at Meghan.Pedro@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Meghan Pedro
Project Manager

ADDRESS 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
PHONE +1 585 288 5380 | FAX +1 585 288 8475
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

1565 Jefferson Rd, Building 300, Rochester, NY 14623 | 585-288-5380 | www.alsglobal.com

ALS Environmental

Client: Test Assured Network
Project: Eagle Harbor Sand and Gravel
Sample Matrix: Water

Service Request: R2001189
Date Received: 02/10/2020

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 02/10/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Semivolatiles by GC/MS:

Method 8270D, 02/18/2020: The upper control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). The field samples analyzed in this sequence did not contain the analyte(s) in question above the Method Reporting Limit (MRL). Since the exceedance equates to a potential high bias, the data quality was not significantly affected and no further corrective action was taken.

Method 8270D, 02/18/2020: The lower control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). Since there were no detections of the analyte(s) above the MRL in the associated field samples, the quantitation is not affected. The data quality was not significantly affected and no further corrective action was taken.

Method 8270D, 02/18/2020: The lower control limit for the spike recovery of the Laboratory Control Sample (LCS) was exceeded for one or more analyte. There were no detections of the analyte(s) in the associated field samples. The LCS/MS/MSD were within limits for all analytes. The analytes affected are flagged in the LCS Summary.

Semivoa GC:

Method 8081B, 02/20/2020: The upper control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). The field samples analyzed in this sequence did not contain the analyte(s) in question above the Method Reporting Limit (MRL). Since the exceedance equates to a potential high bias, the data quality was not significantly affected and no further corrective action was taken.

Metals:

No significant anomalies were noted with this analysis.

General Chemistry:

No significant anomalies were noted with this analysis.

Volatiles by GC/MS:

Method 8260C, 02/18/2020: The upper control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). The field samples analyzed in this sequence did not contain the analyte(s) in question above the Method Reporting Limit (MRL). Since the exceedance equates to a potential high bias, the data quality was not significantly affected and no further corrective action was taken.

Method 8260C, 02/18/2020: The lower control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). Since there were no detections of the analyte(s) above the MRL in the associated field samples, the quantitation is not affected. The data quality was not significantly affected and no further corrective action was taken.

Report revised to include are hardness calculation and more metals.

Approved by Meghan Pedro

Date 02/28/2020

SAMPLE DETECTION SUMMARY

CLIENT ID: PW-1A	Lab ID: R2001189-001					
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
Alkalinity, Total as CaCO3	222			2.0	mg/L	SM 2320 B-1997 (2011)
Chloride	12.3			2.0	mg/L	300.0
Hardness, Total as CaCO3	310			6.62	mg/L	SM 2340 B-1997 (2011)
Nitrate+Nitrite as Nitrogen	10.9			0.50	mg/L	353.2
Nitrogen, Total as Nitrogen	11.0			0.5	mg/L	Calculation
Solids, Total Suspended (TSS)	21.2			1.0	mg/L	SM 2540 D-1997 (2011)
Aluminum, Total	160			100	ug/L	200.7
Calcium, Total	87000			1000	ug/L	200.7
Iron, Total	680			100	ug/L	200.7
Magnesium, Total	22600			1000	ug/L	200.7
Manganese, Total	36			10	ug/L	200.7
Sodium, Total	4500			1000	ug/L	200.7
Zinc, Total	118			20	ug/L	200.7

Sample Receipt Information

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: Test Assured Network **Service Request:** R2001189
Project: Eagle Harbor Sand and Gravel

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R2001189-001	PW-1A	2/6/2020	1535

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM 58924

ALS

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE 1 OF 1

Project Name: Eagle Harbor Sand and Gravel	Project Number: 15139
Project Manager: Steve Trader	Report CC: Tom Biomonte
Company/Address: Alpha Geoscience/ 679 Plank Rd, Clifton Park, NY 12065	
Phone #: 518-461-4692	Email: strader@alphageoscience.com
Sampler's Signature: [signature]	Sampler's Printed Name: Sean Spellman

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOAs ○8260 ○624 ○CLP	GC/MS SVOAs ○8270 ○625	GC VOAs ○8021 ○601/602	PESTICIDES ○8081 ○608	PCBs ○8082 ○608	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)	Alkalinity	Chloride	TSS	Sulfide	Metals (Fe, Zn)	TPO4, TKN, NO2, NO3, Tiron		REMARKS/ ALTERNATE DESCRIPTION
PRESERVATIVE						1	0		0		2		0	6	0	5	2	3		
PW-1A		2/6/2020	15:35	GW		1														Method 8260
↓		↓		↓			2													Method 8270
									2											EPA 8081
											1									
												1								
													1							
														1						
															1					
																1				
																	1			
																		1		

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other ______

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See OAPP ☐

STATE WHERE SAMPLES WERE COLLECTED: New York

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ 1 day ____ 2 day ____ 3 day
____ 4 day ____ 5 day
X Standard (10 business days-No Surcharge)

REQUESTED REPORT DATE ________

REPORT REQUIREMENTS
X I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data

Edata ____ Yes ____ No

INVOICE INFORMATION

R2001189 5
Test Assured Network
Stormwater

Tom Biomonte

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: [signature]	Signature: [signature]	Signature: [signature]	Signature: [signature]	Signature: [signature]	Signature: [signature]
Printed Name: Sean Spellman	Printed Name: JENNIFFER SCHMIDT	Printed Name: JENNIFFER SCHMIDT	Printed Name: [illegible]	Printed Name: [illegible]	Printed Name: [illegible]
Firm: Alpha GeoScience	Firm: EAGLE HARBOR	Firm: EAGLE HARBOR	Firm: ALS	Firm: ALS	Firm: ALS
Date/Time: 17:00/ 2-6-2020	Date/Time: 5pm 2-6-20	Date/Time: 11:25 2-10-20	Date/Time: 2/10/20 1125	Date/Time: 2/10/20 1345	Date/Time: 2/10/2020/1345

Distribution: White - Lab Copy; Yellow - Return to Originator

GW=Ground Water

R2001189 5
Test Assured Network
Stormwater

Cooler Receipt and Preservation Check Form

Project/Client________________________ Folder Number______________

Cooler received on 2/10/2020 by: [illegible]   **COURIER:** ALS (circled) UPS FEDEX VELOCITY CLIENT

1	Were **Custody seals** on outside of cooler?	Y N (N circled)	5a	**Perchlorate** samples have required headspace?	Y N NA (NA circled)
2	**Custody papers** properly completed (ink, signed)?	Y (circled) N	5b	Did VOA vials, Alk,or Sulfide have sig* **bubbles**?	Y N NA (NA circled)
3	Did all bottles arrive in good **condition** (unbroken)?	Y (circled) N	6	Where did the bottles originate?	ALS/ROC (circled) CLIENT
4	Circle: **Wet Ice** (circled) **Dry Ice** **Gel packs** present?	Y (circled) N	7	Soil VOA received as: Bulk Encore 5035set	NA (circled)

8. Temperature Readings Date: 2/10/2020 Time: 1350 ID: IR#7 IR#10 (circled) From: Temp Blank Sample Bottle (circled)

Observed Temp (°C)	0.40	3.40					
Within 0-6°C?	Y (circled) N	Y (circled) N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: ___________ Ice melted Poorly Packed (described below) Same Day Rule

&Client Approval to Run Samples: ________ Standing Approval Client aware at drop-off Client notified by: ____________

All samples held in storage location: R-002 by [illegible] on 2/10/2020 at 1350
5035 samples placed in storage location: ________ by ________ on ______ at ______

Cooler Breakdown/Preservation Check**: Date: 2/11/2020 Time: 1118 by: [illegible]

9. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? YES (circled) NO
10. Did all bottle labels and tags agree with custody papers? YES NO (circled)
11. Were correct containers used for the tests indicated? YES (circled) NO
12. Were 5035 vials acceptable (no extra labels, not leaking)? YES NO N/A (circled)
13. Air Samples: Cassettes / Tubes Intact with MS? Canisters Pressurized Tedlar® Bags Inflated N/A (circled)

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID Adjusted	Vol. Added	Lot Added	Final pH
≥12		NaOH			in lab					
≤2	230018	HNO_3	✓		1118091					
≤2		H_2SO_4		✓	none		-001	0.5ml	J066-11	≤2
<4		$NaHSO_4$								
5-9		For 608pest			No=Notify for 3day					
Residual Chlorine (-)		For CN, Phenol, 625, 608pest, 522			If +, contact PM to add $Na_2S_2O_3$ (625, 608, CN), ascorbic (phenol).					
		$Na_2S_2O_3$								
		ZnAcetate	-	-	in lab		**VOAs and 1664 Not to be tested before analysis. Otherwise, all bottles of all samples with chemical preservatives are checked (not just representatives).			
		HCl	**	**	411810					

Bottle lot numbers: 19-10-11, 80719-01, 9-093-001, 061019-1AL
Explain all Discrepancies/ Other Comments:

poured out for Nutrients.

HPROD	BULK
HTR	FLDT
SUB	HGFB
ALS	LL3541

Labels secondary reviewed by: [illegible]
PC Secondary Review: ______________

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

Miscellaneous Forms

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

REPORT QUALIFIERS AND DEFINITIONS

U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.

J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).

B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.

E Organics- Concentration has exceeded the calibration range for that specific analysis.

D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.

* Indicates that a quality control parameter has exceeded laboratory limits. Under the ñNotesò column of the Form I, this qualifier denotes analysis was performed out of Holding Time.

H Analysis was performed out of hold time for tests that have an ñimmediateò hold time criteria.

Spike was diluted out.

+ Correlation coefficient for MSA is <0.995.

N Inorganics- Matrix spike recovery was outside laboratory limits.

N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.

S Concentration has been determined using Method of Standard Additions (MSA).

W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.

P Concentration >40% difference between the two GC columns.

C Confirmed by GC/MS

Q DoD reports: indicates a pesticide/Aroclor is not confirmed (Ó100% Difference between two GC columns).

X See Case Narrative for discussion.

MRL Method Reporting Limit. Also known as:
LOQ Limit of Quantitation (LOQ)
The lowest concentration at which the method analyte may be reliably quantified under the method conditions.

MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).

LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.

ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

Rochester Lab ID # for State Certifications[1]

Connecticut ID # PH0556	Maine ID #NY0032	Pennsylvania ID# 68-786
Delaware Approved	New Hampshire ID # 2941	Rhode Island ID # 158
DoD ELAP #65817	New York ID # 10145	Virginia #460167
Florida ID # E87674	North Carolina #676	

[1] Analyses were performed according to our laboratoryõs NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the case narrative. Since not all analyte/method/matrix combinations are offered for state/NELAC accreditation, this report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to https://www.alsglobal.com/locations/americas/north-america/usa/new-york/rochester-environmental

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Test Assured Network **Service Request:** R2001189
Project: Eagle Harbor Sand and Gravel/

Sample Name: PW-1A **Date Collected:** 02/6/20
Lab Code: R2001189-001 **Date Received:** 02/10/20
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
200.7	CKUTZER	KMCLAEN
300.0		KWONG
351.2	GNITAJOUPPI	GNITAJOUPPI
353.2		GNITAJOUPPI
365.1	STALARICO	MROGERSON
8081B	KSERCU	BALLGEIER
8260C		AMOSES
8270D	JMISIUREWICZ	JMISIUREWICZ
SM 2320 B-1997(2011)		KWONG
SM 2540 D-1997(2011)		GKNIGHT
SM 4500-S2-F-2000(2011)		KMENGS

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9034 Sulfide Acid Soluble	9030B
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7199	3060A
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction
For analytical methods not listed, the preparation method is the same as the analytical method reference.	

Sample Results

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Volatile Organic Compounds by GC/MS

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	02/06/20 15:35
Sample Matrix:	Water	**Date Received:**	02/10/20 13:50
Sample Name:	PW-1A	**Units:**	ug/L
Lab Code:	R2001189-001	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: EPA 5030C

Analyte Name	Result		MRL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	1	02/18/20 14:41	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	1	02/18/20 14:41	
1,1,2-Trichloroethane	5.0	U	5.0	1	02/18/20 14:41	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	1	02/18/20 14:41	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	1	02/18/20 14:41	
1,2-Dichloroethane	5.0	U	5.0	1	02/18/20 14:41	
1,2-Dichloropropane	5.0	U	5.0	1	02/18/20 14:41	
2-Butanone (MEK)	10	U	10	1	02/18/20 14:41	
2-Hexanone	10	U	10	1	02/18/20 14:41	
4-Methyl-2-pentanone	10	U	10	1	02/18/20 14:41	
Acetone	10	U	10	1	02/18/20 14:41	
Benzene	5.0	U	5.0	1	02/18/20 14:41	
Bromodichloromethane	5.0	U	5.0	1	02/18/20 14:41	
Bromoform	5.0	U	5.0	1	02/18/20 14:41	
Bromomethane	5.0	U	5.0	1	02/18/20 14:41	
Carbon Disulfide	10	U	10	1	02/18/20 14:41	
Carbon Tetrachloride	5.0	U	5.0	1	02/18/20 14:41	
Chlorobenzene	5.0	U	5.0	1	02/18/20 14:41	
Chloroethane	5.0	U	5.0	1	02/18/20 14:41	
Chloroform	5.0	U	5.0	1	02/18/20 14:41	
Chloromethane	5.0	U	5.0	1	02/18/20 14:41	
Dibromochloromethane	5.0	U	5.0	1	02/18/20 14:41	
Dichloromethane	5.0	U	5.0	1	02/18/20 14:41	
Ethylbenzene	5.0	U	5.0	1	02/18/20 14:41	
Styrene	5.0	U	5.0	1	02/18/20 14:41	
Tetrachloroethene (PCE)	5.0	U	5.0	1	02/18/20 14:41	
Toluene	5.0	U	5.0	1	02/18/20 14:41	
Trichloroethene (TCE)	5.0	U	5.0	1	02/18/20 14:41	
Vinyl Chloride	5.0	U	5.0	1	02/18/20 14:41	
cis-1,2-Dichloroethene	5.0	U	5.0	1	02/18/20 14:41	
cis-1,3-Dichloropropene	5.0	U	5.0	1	02/18/20 14:41	
m,p-Xylenes	5.0	U	5.0	1	02/18/20 14:41	
o-Xylene	5.0	U	5.0	1	02/18/20 14:41	
trans-1,2-Dichloroethene	5.0	U	5.0	1	02/18/20 14:41	
trans-1,3-Dichloropropene	5.0	U	5.0	1	02/18/20 14:41	

Client: Test Assured Network
Project: Eagle Harbor Sand and Gravel
Sample Matrix: Water

Service Request: R2001189
Date Collected: 02/06/20 15:35
Date Received: 02/10/20 13:50

Sample Name: PW-1A
Lab Code: R2001189-001

Units: ug/L
Basis: NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: EPA 5030C

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	99	85 - 122	02/18/20 14:41	
Dibromofluoromethane	101	89 - 119	02/18/20 14:41	
Toluene-d8	103	87 - 121	02/18/20 14:41	

Semivolatile Organic Compounds by GC/MS

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	02/06/20 15:35
Sample Matrix:	Water	**Date Received:**	02/10/20 13:50
Sample Name:	PW-1A	**Units:**	ug/L
Lab Code:	R2001189-001	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3510C

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	10	U	10	1	02/18/20 14:47	2/13/20	
1,2-Dichlorobenzene	10	U	10	1	02/18/20 14:47	2/13/20	
1,3-Dichlorobenzene	10	U	10	1	02/18/20 14:47	2/13/20	
1,4-Dichlorobenzene	10	U	10	1	02/18/20 14:47	2/13/20	
2,4,5-Trichlorophenol	10	U	10	1	02/18/20 14:47	2/13/20	
2,4,6-Trichlorophenol	10	U	10	1	02/18/20 14:47	2/13/20	
2,4-Dichlorophenol	10	U	10	1	02/18/20 14:47	2/13/20	
2,4-Dimethylphenol	10	U	10	1	02/18/20 14:47	2/13/20	
2,4-Dinitrophenol	50	U	50	1	02/18/20 14:47	2/13/20	
2,4-Dinitrotoluene	10	U	10	1	02/18/20 14:47	2/13/20	
2,6-Dinitrotoluene	10	U	10	1	02/18/20 14:47	2/13/20	
2-Chloronaphthalene	10	U	10	1	02/18/20 14:47	2/13/20	
2-Chlorophenol	10	U	10	1	02/18/20 14:47	2/13/20	
2-Methylnaphthalene	10	U	10	1	02/18/20 14:47	2/13/20	
2-Methylphenol	10	U	10	1	02/18/20 14:47	2/13/20	
2-Nitroaniline	50	U	50	1	02/18/20 14:47	2/13/20	
2-Nitrophenol	10	U	10	1	02/18/20 14:47	2/13/20	
3,3'-Dichlorobenzidine	10	U	10	1	02/18/20 14:47	2/13/20	
3- and 4-Methylphenol Coelution	10	U	10	1	02/18/20 14:47	2/13/20	
3-Nitroaniline	50	U	50	1	02/18/20 14:47	2/13/20	
4,6-Dinitro-2-methylphenol	50	U	50	1	02/18/20 14:47	2/13/20	
4-Bromophenyl Phenyl Ether	10	U	10	1	02/18/20 14:47	2/13/20	
4-Chloro-3-methylphenol	10	U	10	1	02/18/20 14:47	2/13/20	
4-Chloroaniline	10	U	10	1	02/18/20 14:47	2/13/20	
4-Chlorophenyl Phenyl Ether	10	U	10	1	02/18/20 14:47	2/13/20	
4-Nitroaniline	50	U	50	1	02/18/20 14:47	2/13/20	
4-Nitrophenol	50	U	50	1	02/18/20 14:47	2/13/20	
Acenaphthene	10	U	10	1	02/18/20 14:47	2/13/20	
Acenaphthylene	10	U	10	1	02/18/20 14:47	2/13/20	
Anthracene	10	U	10	1	02/18/20 14:47	2/13/20	
Benz(a)anthracene	10	U	10	1	02/18/20 14:47	2/13/20	
Benzo(a)pyrene	10	U	10	1	02/18/20 14:47	2/13/20	
Benzo(b)fluoranthene	10	U	10	1	02/18/20 14:47	2/13/20	
Benzo(g,h,i)perylene	10	U	10	1	02/18/20 14:47	2/13/20	
Benzo(k)fluoranthene	10	U	10	1	02/18/20 14:47	2/13/20	
Benzyl Alcohol	10	U	10	1	02/18/20 14:47	2/13/20	
2,2'-Oxybis(1-chloropropane)	10	U	10	1	02/18/20 14:47	2/13/20	
Bis(2-chloroethoxy)methane	10	U	10	1	02/18/20 14:47	2/13/20	
Bis(2-chloroethyl) Ether	10	U	10	1	02/18/20 14:47	2/13/20	
Bis(2-ethylhexyl) Phthalate	10	U	10	1	02/18/20 14:47	2/13/20	
Butyl Benzyl Phthalate	10	U	10	1	02/18/20 14:47	2/13/20	
Carbazole	10	U	10	1	02/18/20 14:47	2/13/20	
Chrysene	10	U	10	1	02/18/20 14:47	2/13/20	

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	02/06/20 15:35
Sample Matrix:	Water	**Date Received:**	02/10/20 13:50
Sample Name:	PW-1A	**Units:**	ug/L
Lab Code:	R2001189-001	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3510C

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Di-n-butyl Phthalate	10	U	10	1	02/18/20 14:47	2/13/20	
Di-n-octyl Phthalate	10	U	10	1	02/18/20 14:47	2/13/20	
Dibenz(a,h)anthracene	10	U	10	1	02/18/20 14:47	2/13/20	
Dibenzofuran	10	U	10	1	02/18/20 14:47	2/13/20	
Diethyl Phthalate	10	U	10	1	02/18/20 14:47	2/13/20	
Dimethyl Phthalate	10	U	10	1	02/18/20 14:47	2/13/20	
Fluoranthene	10	U	10	1	02/18/20 14:47	2/13/20	
Fluorene	10	U	10	1	02/18/20 14:47	2/13/20	
Hexachlorobenzene	10	U	10	1	02/18/20 14:47	2/13/20	
Hexachlorobutadiene	10	U	10	1	02/18/20 14:47	2/13/20	
Hexachlorocyclopentadiene	10	U	10	1	02/18/20 14:47	2/13/20	
Hexachloroethane	10	U	10	1	02/18/20 14:47	2/13/20	
Indeno(1,2,3-cd)pyrene	10	U	10	1	02/18/20 14:47	2/13/20	
Isophorone	10	U	10	1	02/18/20 14:47	2/13/20	
N-Nitrosodi-n-propylamine	10	U	10	1	02/18/20 14:47	2/13/20	
N-Nitrosodimethylamine	10	U	10	1	02/18/20 14:47	2/13/20	
N-Nitrosodiphenylamine	10	U	10	1	02/18/20 14:47	2/13/20	
Naphthalene	10	U	10	1	02/18/20 14:47	2/13/20	
Nitrobenzene	10	U	10	1	02/18/20 14:47	2/13/20	
Pentachlorophenol (PCP)	50	U	50	1	02/18/20 14:47	2/13/20	
Phenanthrene	10	U	10	1	02/18/20 14:47	2/13/20	
Phenol	10	U	10	1	02/18/20 14:47	2/13/20	
Pyrene	10	U	10	1	02/18/20 14:47	2/13/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	64	35 - 141	02/18/20 14:47	
2-Fluorobiphenyl	61	31 - 118	02/18/20 14:47	
2-Fluorophenol	29	10 - 105	02/18/20 14:47	
Nitrobenzene-d5	58	31 - 110	02/18/20 14:47	
Phenol-d6	20	10 - 107	02/18/20 14:47	
p-Terphenyl-d14	46	10 - 165	02/18/20 14:47	

Semivolatile Organic Compounds by GC

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	02/06/20 15:35
Sample Matrix:	Water	**Date Received:**	02/10/20 13:50
Sample Name:	PW-1A	**Units:**	ug/L
Lab Code:	R2001189-001	**Basis:**	NA

Organochlorine Pesticides by Gas Chromatography

Analysis Method: 8081B
Prep Method: EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
4,4'-DDD	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
4,4'-DDE	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
4,4'-DDT	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
Aldrin	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
Dieldrin	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
Endosulfan I	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
Endosulfan II	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
Endosulfan Sulfate	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
Endrin	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
Endrin Aldehyde	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
Endrin Ketone	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
Heptachlor	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
Heptachlor Epoxide	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
Methoxychlor	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
Toxaphene	0.50 U	0.50	1	02/20/20 05:03	2/13/20	
alpha-BHC	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
alpha-Chlordane	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
beta-BHC	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
delta-BHC	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
gamma-BHC (Lindane)	0.050 U	0.050	1	02/20/20 05:03	2/13/20	
gamma-Chlordane	0.050 U	0.050	1	02/20/20 05:03	2/13/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	44	10 - 164	02/20/20 05:03	
Tetrachloro-m-xylene	73	10 - 147	02/20/20 05:03	

Metals

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	02/06/20 15:35
Sample Matrix:	Water	**Date Received:**	02/10/20 13:50
Sample Name:	PW-1A	**Basis:**	NA
Lab Code:	R2001189-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result		Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum, Total	200.7	**160**		ug/L	100	1	02/12/20 20:35	02/12/20	
Calcium, Total	200.7	**87000**		ug/L	1000	1	02/12/20 20:35	02/12/20	
Iron, Total	200.7	**680**		ug/L	100	1	02/12/20 20:35	02/12/20	
Magnesium, Total	200.7	**22600**		ug/L	1000	1	02/12/20 20:35	02/12/20	
Manganese, Total	200.7	**36**		ug/L	10	1	02/12/20 20:35	02/12/20	
Potassium, Total	200.7	2000	U	ug/L	2000	1	02/12/20 20:35	02/12/20	
Sodium, Total	200.7	**4500**		ug/L	1000	1	02/12/20 20:35	02/12/20	
Zinc, Total	200.7	**118**		ug/L	20	1	02/12/20 20:35	02/12/20	

General Chemistry

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	02/06/20 15:35
Sample Matrix:	Water	**Date Received:**	02/10/20 13:50
Sample Name:	PW-1A	**Basis:**	NA
Lab Code:	R2001189-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result		Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity, Total as CaCO3	SM 2320 B-1997(2011)	**222**		mg/L	2.0	1	02/18/20 13:38	NA	
Chloride	300.0	**12.3**		mg/L	2.0	10	02/12/20 14:35	NA	
Hardness, Total as CaCO3	SM 2340 B-1997(2011)	**310**		mg/L	6.62	1	NA	NA	
Nitrate+Nitrite as Nitrogen	353.2	**10.9**		mg/L	0.50	10	02/12/20 11:00	NA	
Nitrogen, Total as Nitrogen	Calculation	**11.0**		mg/L	0.5	1	NA	NA	
Nitrogen, Total Kjeldahl (TKN)	351.2	0.20	U	mg/L	0.20	1	02/14/20 15:01	02/13/20	
Phosphorus, Total	365.1	0.050	U	mg/L	0.050	1	02/13/20 19:42	02/12/20	
Solids, Total Suspended (TSS)	SM 2540 D-1997(2011)	**21.2**		mg/L	1.0	1	02/13/20 14:30	NA	
Sulfide	SM 4500-S2-F-2000(2011)	0.97	U	mg/L	0.97	1	02/11/20 07:10	NA	

QC Summary Forms

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Volatile Organic Compounds by GC/MS

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel		
Sample Matrix:	Water		

SURROGATE RECOVERY SUMMARY
Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Extraction Method: EPA 5030C

Sample Name	Lab Code	4-Bromofluorobenzene 85-122	Dibromofluoromethane 89-119	Toluene-d8 87-121
PW-1A	R2001189-001	99	101	103
Method Blank	RQ2001583-07	95	98	98
Lab Control Sample	RQ2001583-05	96	103	98

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	RQ2001583-07	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: EPA 5030C

Analyte Name	Result		MRL	Dil.	Date Analyzed	Q
1,1,1-Trichloroethane (TCA)	5.0	U	5.0	1	02/18/20 14:19	
1,1,2,2-Tetrachloroethane	5.0	U	5.0	1	02/18/20 14:19	
1,1,2-Trichloroethane	5.0	U	5.0	1	02/18/20 14:19	
1,1-Dichloroethane (1,1-DCA)	5.0	U	5.0	1	02/18/20 14:19	
1,1-Dichloroethene (1,1-DCE)	5.0	U	5.0	1	02/18/20 14:19	
1,2-Dichloroethane	5.0	U	5.0	1	02/18/20 14:19	
1,2-Dichloropropane	5.0	U	5.0	1	02/18/20 14:19	
2-Butanone (MEK)	10	U	10	1	02/18/20 14:19	
2-Hexanone	10	U	10	1	02/18/20 14:19	
4-Methyl-2-pentanone	10	U	10	1	02/18/20 14:19	
Acetone	10	U	10	1	02/18/20 14:19	
Benzene	5.0	U	5.0	1	02/18/20 14:19	
Bromodichloromethane	5.0	U	5.0	1	02/18/20 14:19	
Bromoform	5.0	U	5.0	1	02/18/20 14:19	
Bromomethane	5.0	U	5.0	1	02/18/20 14:19	
Carbon Disulfide	10	U	10	1	02/18/20 14:19	
Carbon Tetrachloride	5.0	U	5.0	1	02/18/20 14:19	
Chlorobenzene	5.0	U	5.0	1	02/18/20 14:19	
Chloroethane	5.0	U	5.0	1	02/18/20 14:19	
Chloroform	5.0	U	5.0	1	02/18/20 14:19	
Chloromethane	5.0	U	5.0	1	02/18/20 14:19	
Dibromochloromethane	5.0	U	5.0	1	02/18/20 14:19	
Dichloromethane	5.0	U	5.0	1	02/18/20 14:19	
Ethylbenzene	5.0	U	5.0	1	02/18/20 14:19	
Styrene	5.0	U	5.0	1	02/18/20 14:19	
Tetrachloroethene (PCE)	5.0	U	5.0	1	02/18/20 14:19	
Toluene	5.0	U	5.0	1	02/18/20 14:19	
Trichloroethene (TCE)	5.0	U	5.0	1	02/18/20 14:19	
Vinyl Chloride	5.0	U	5.0	1	02/18/20 14:19	
cis-1,2-Dichloroethene	5.0	U	5.0	1	02/18/20 14:19	
cis-1,3-Dichloropropene	5.0	U	5.0	1	02/18/20 14:19	
m,p-Xylenes	5.0	U	5.0	1	02/18/20 14:19	
o-Xylene	5.0	U	5.0	1	02/18/20 14:19	
trans-1,2-Dichloroethene	5.0	U	5.0	1	02/18/20 14:19	
trans-1,3-Dichloropropene	5.0	U	5.0	1	02/18/20 14:19	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	RQ2001583-07	**Basis:**	NA

Volatile Organic Compounds by GC/MS

Analysis Method: 8260C
Prep Method: EPA 5030C

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromofluorobenzene	95	85 - 122	02/18/20 14:19	
Dibromofluoromethane	98	89 - 119	02/18/20 14:19	
Toluene-d8	98	87 - 121	02/18/20 14:19	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Analyzed:**	02/18/20
Sample Matrix:	Water		

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Units:ug/L
Basis:NA

Lab Control Sample
RQ2001583-05

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
1,1,1-Trichloroethane (TCA)	8260C	22.0	20.0	110	75-125
1,1,2,2-Tetrachloroethane	8260C	22.0	20.0	110	78-126
1,1,2-Trichloroethane	8260C	23.4	20.0	117	82-121
1,1-Dichloroethane (1,1-DCA)	8260C	21.0	20.0	105	80-124
1,1-Dichloroethene (1,1-DCE)	8260C	19.8	20.0	99	71-118
1,2-Dichloroethane	8260C	21.2	20.0	106	71-127
1,2-Dichloropropane	8260C	20.2	20.0	101	80-119
2-Butanone (MEK)	8260C	19.4	20.0	97	61-137
2-Hexanone	8260C	19.3	20.0	96	63-124
4-Methyl-2-pentanone	8260C	19.5	20.0	97	66-124
Acetone	8260C	15.6	20.0	78	40-161
Benzene	8260C	22.4	20.0	112	79-119
Bromodichloromethane	8260C	23.9	20.0	120	81-123
Bromoform	8260C	25.1	20.0	125	65-146
Bromomethane	8260C	17.9	20.0	89	42-166
Carbon Disulfide	8260C	19.8	20.0	99	66-128
Carbon Tetrachloride	8260C	21.6	20.0	108	70-127
Chlorobenzene	8260C	22.4	20.0	112	80-121
Chloroethane	8260C	18.7	20.0	93	62-131
Chloroform	8260C	22.5	20.0	113	79-120
Chloromethane	8260C	19.8	20.0	99	65-135
Dibromochloromethane	8260C	25.4	20.0	127	72-128
Dichloromethane	8260C	22.2	20.0	111	73-122
Ethylbenzene	8260C	21.3	20.0	106	76-120
Styrene	8260C	21.2	20.0	106	80-124
Tetrachloroethene (PCE)	8260C	20.3	20.0	102	72-125
Toluene	8260C	21.3	20.0	107	79-119
Trichloroethene (TCE)	8260C	20.4	20.0	102	74-122
Vinyl Chloride	8260C	18.4	20.0	92	74-159
cis-1,2-Dichloroethene	8260C	20.7	20.0	104	80-121
cis-1,3-Dichloropropene	8260C	21.7	20.0	108	77-122
m,p-Xylenes	8260C	44.2	40.0	111	80-126
o-Xylene	8260C	22.0	20.0	110	79-123

Client: Test Assured Network
Project: Eagle Harbor Sand and Gravel
Sample Matrix: Water

Service Request: R2001189
Date Analyzed: 02/18/20

Lab Control Sample Summary
Volatile Organic Compounds by GC/MS

Units: ug/L
Basis: NA

Lab Control Sample
RQ2001583-05

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
trans-1,2-Dichloroethene	8260C	21.8	20.0	109	73-118
trans-1,3-Dichloropropene	8260C	21.2	20.0	106	71-133

Semivolatile Organic Compounds by GC/MS

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: Test Assured Network **Service Request:** R2001189
Project: Eagle Harbor Sand and Gravel
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Extraction Method: EPA 3510C

Sample Name	Lab Code	2,4,6-Tribromophenol 35-141	2-Fluorobiphenyl 31-118	2-Fluorophenol 10-105
PW-1A	R2001189-001	64	61	29
Method Blank	RQ2001428-01	56	55	28
Lab Control Sample	RQ2001428-02	64	58	30
Duplicate Lab Control Sample	RQ2001428-03	69	63	31
PW-1A MS	RQ2001428-04	66	57	32
PW-1A DMS	RQ2001428-05	66	61	29

Client: Test Assured Network **Service Request:** R2001189
Project: Eagle Harbor Sand and Gravel
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Extraction Method: EPA 3510C

Sample Name	Lab Code	Nitrobenzene-d5 31-110	Phenol-d6 10-107	p-Terphenyl-d14 10-165
PW-1A	R2001189-001	58	20	46
Method Blank	RQ2001428-01	52	19	61
Lab Control Sample	RQ2001428-02	52	20	62
Duplicate Lab Control Sample	RQ2001428-03	58	21	63
PW-1A MS	RQ2001428-04	54	20	45
PW-1A DMS	RQ2001428-05	56	20	43

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	02/06/20
Sample Matrix:	Water	**Date Received:**	02/10/20
		Date Analyzed:	02/18/20
		Date Extracted:	02/13/20

Duplicate Matrix Spike Summary
Semivolatile Organic Compounds by GC/MS

Sample Name:	PW-1A	**Units:**	ug/L
Lab Code:	R2001189-001	**Basis:**	NA
Analysis Method:	8270D		
Prep Method:	EPA 3510C		

		Matrix Spike RQ2001428-04			**Duplicate Matrix Spike** RQ2001428-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
1,2,4-Trichlorobenzene	10 U	28.0	50.0	56	30.7	49.5	62	10-127	10	30
1,2-Dichlorobenzene	10 U	27.6	50.0	55	29.8	49.5	60	17-105	9	30
1,3-Dichlorobenzene	10 U	25.8	50.0	52	27.8	49.5	56	21-99	7	30
1,4-Dichlorobenzene	10 U	26.4	50.0	53	27.6	49.5	56	10-124	6	30
2,4,5-Trichlorophenol	10 U	33.5	50.0	67	33.6	49.5	68	48-134	1	30
2,4,6-Trichlorophenol	10 U	33.8	50.0	68	33.8	49.5	68	44-135	<1	30
2,4-Dichlorophenol	10 U	31.4	50.0	63	31.1	49.5	63	40-130	<1	30
2,4-Dimethylphenol	10 U	29.5	50.0	59	28.5	49.5	57	42-121	3	30
2,4-Dinitrophenol	50 U	26.8 J	50.0	54	26.8 J	49.5	54	21-168	<1	30
2,4-Dinitrotoluene	10 U	39.0	50.0	78	39.3	49.5	79	37-143	1	30
2,6-Dinitrotoluene	10 U	39.0	50.0	78	39.6	49.5	80	39-136	3	30
2-Chloronaphthalene	10 U	30.6	50.0	61	32.1	49.5	65	40-108	6	30
2-Chlorophenol	10 U	27.5	50.0	55	26.8	49.5	54	37-112	2	30
2-Methylnaphthalene	10 U	29.8	50.0	60	31.7	49.5	64	34-102	6	30
2-Methylphenol	10 U	25.3	50.0	51	24.1	49.5	49	37-102	4	30
2-Nitroaniline	50 U	34.7 J	50.0	69	35.8 J	49.5	72	40-136	4	30
2-Nitrophenol	10 U	35.5	50.0	71	36.7	49.5	74	27-143	4	30
3,3'-Dichlorobenzidine	10 U	27.9	50.0	56	26.9	49.5	54	11-131	4	30
3- and 4-Methylphenol Coelution	10 U	22.2	50.0	44	21.4	49.5	43	30-95	2	30
3-Nitroaniline	50 U	28.5 J	50.0	57	28.0 J	49.5	57	19-117	<1	30
4,6-Dinitro-2-methylphenol	50 U	35.8 J	50.0	72	36.0 J	49.5	73	25-154	1	30
4-Bromophenyl Phenyl Ether	10 U	28.2	50.0	56	29.9	49.5	60	39-115	7	30
4-Chloro-3-methylphenol	10 U	30.0	50.0	60	29.2	49.5	59	41-126	2	30
4-Chloroaniline	10 U	25.1	50.0	50	25.8	49.5	52	19-111	4	30
4-Chlorophenyl Phenyl Ether	10 U	29.8	50.0	60	29.7	49.5	60	41-111	<1	30
4-Nitroaniline	50 U	35.9 J	50.0	72	34.7 J	49.5	70	18-143	3	30
4-Nitrophenol	50 U	16.0 J	50.0	32	15.5 J	49.5	31	10-126	3	30
Acenaphthene	10 U	32.7	50.0	65	33.4	49.5	67	43-117	3	30
Acenaphthylene	10 U	34.6	50.0	69	35.6	49.5	72	45-119	4	30
Anthracene	10 U	33.1	50.0	66	34.8	49.5	70	45-127	6	30
Benz(a)anthracene	10 U	32.7	50.0	65	33.3	49.5	67	46-126	3	30
Benzo(a)pyrene	10 U	38.3	50.0	77	39.1	49.5	79	44-114	3	30
Benzo(b)fluoranthene	10 U	35.0	50.0	70	35.2	49.5	71	41-127	1	30
Benzo(g,h,i)perylene	10 U	36.6	50.0	73	37.7	49.5	76	50-143	4	30
Benzo(k)fluoranthene	10 U	37.4	50.0	75	37.0	49.5	75	46-139	<1	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	02/06/20
Sample Matrix:	Water	**Date Received:**	02/10/20
		Date Analyzed:	02/18/20
		Date Extracted:	02/13/20

Duplicate Matrix Spike Summary
Semivolatile Organic Compounds by GC/MS

Sample Name:	PW-1A	**Units:**	ug/L
Lab Code:	R2001189-001	**Basis:**	NA
Analysis Method:	8270D		
Prep Method:	EPA 3510C		

		Matrix Spike RQ2001428-04			Duplicate Matrix Spike RQ2001428-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Benzyl Alcohol	10 U	29.2	50.0	58	28.5	49.5	58	31-109	<1	30
2,2'-Oxybis(1-chloropropane)	10 U	22.3	50.0	45	23.9	49.5	48	21-126	6	30
Bis(2-chloroethoxy)methane	10 U	28.9	50.0	58	30.0	49.5	61	41-118	5	30
Bis(2-chloroethyl) Ether	10 U	26.9	50.0	54	27.1	49.5	55	33-108	2	30
Bis(2-ethylhexyl) Phthalate	10 U	37.8	50.0	76	38.2	49.5	77	41-132	1	30
Butyl Benzyl Phthalate	10 U	35.2	50.0	70	35.5	49.5	72	41-148	3	30
Carbazole	10 U	35.8	50.0	72	37.3	49.5	75	39-144	4	30
Chrysene	10 U	33.1	50.0	66	33.5	49.5	68	47-126	3	30
Di-n-butyl Phthalate	10 U	37.2	50.0	74	38.6	49.5	78	43-130	5	30
Di-n-octyl Phthalate	10 U	38.5	50.0	77	38.2	49.5	77	40-139	<1	30
Dibenz(a,h)anthracene	10 U	30.3	50.0	61	30.9	49.5	62	43-136	2	30
Dibenzofuran	10 U	34.8	50.0	70	35.2	49.5	71	46-119	1	30
Diethyl Phthalate	10 U	35.7	50.0	71	35.9	49.5	72	36-122	1	30
Dimethyl Phthalate	10 U	33.9	50.0	68	34.4	49.5	70	33-123	3	30
Fluoranthene	10 U	34.2	50.0	68	35.3	49.5	71	43-135	4	30
Fluorene	10 U	33.5	50.0	67	33.1	49.5	67	43-113	<1	30
Hexachlorobenzene	10 U	33.3	50.0	67	33.4	49.5	68	42-125	1	30
Hexachlorobutadiene	10 U	29.6	50.0	59	28.6	49.5	58	10-111	2	30
Hexachlorocyclopentadiene	10 U	25.6	50.0	51	25.5	49.5	51	10-103	<1	30
Hexachloroethane	10 U	22.5	50.0	45	24.1	49.5	49	12-101	9	30
Indeno(1,2,3-cd)pyrene	10 U	37.2	50.0	74	37.1	49.5	75	49-140	1	30
Isophorone	10 U	24.3	50.0	49	26.5	49.5	53	40-111	8	30
N-Nitrosodi-n-propylamine	10 U	30.8	50.0	62	32.0	49.5	65	35-108	5	30
N-Nitrosodimethylamine	10 U	21.4	50.0	43	20.4	49.5	41	20-80	5	30
N-Nitrosodiphenylamine	10 U	35.5	50.0	71	37.5	49.5	76	43-127	7	30
Naphthalene	10 U	29.6	50.0	59	30.7	49.5	62	37-108	5	30
Nitrobenzene	10 U	27.5	50.0	55	29.1	49.5	59	35-112	7	30
Pentachlorophenol (PCP)	50 U	23.1 J	50.0	46	24.6 J	49.5	50	29-164	8	30
Phenanthrene	10 U	33.0	50.0	66	34.8	49.5	70	46-123	6	30
Phenol	10 U	12.0	50.0	24	11.5	49.5	23	10-113	4	30
Pyrene	10 U	36.5	50.0	73	37.8	49.5	76	44-129	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	RQ2001428-01	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3510C

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
1,2,4-Trichlorobenzene	10	U	10	1	02/18/20 12:55	2/13/20	
1,2-Dichlorobenzene	10	U	10	1	02/18/20 12:55	2/13/20	
1,3-Dichlorobenzene	10	U	10	1	02/18/20 12:55	2/13/20	
1,4-Dichlorobenzene	10	U	10	1	02/18/20 12:55	2/13/20	
2,4,5-Trichlorophenol	10	U	10	1	02/18/20 12:55	2/13/20	
2,4,6-Trichlorophenol	10	U	10	1	02/18/20 12:55	2/13/20	
2,4-Dichlorophenol	10	U	10	1	02/18/20 12:55	2/13/20	
2,4-Dimethylphenol	10	U	10	1	02/18/20 12:55	2/13/20	
2,4-Dinitrophenol	50	U	50	1	02/18/20 12:55	2/13/20	
2,4-Dinitrotoluene	10	U	10	1	02/18/20 12:55	2/13/20	
2,6-Dinitrotoluene	10	U	10	1	02/18/20 12:55	2/13/20	
2-Chloronaphthalene	10	U	10	1	02/18/20 12:55	2/13/20	
2-Chlorophenol	10	U	10	1	02/18/20 12:55	2/13/20	
2-Methylnaphthalene	10	U	10	1	02/18/20 12:55	2/13/20	
2-Methylphenol	10	U	10	1	02/18/20 12:55	2/13/20	
2-Nitroaniline	50	U	50	1	02/18/20 12:55	2/13/20	
2-Nitrophenol	10	U	10	1	02/18/20 12:55	2/13/20	
3,3'-Dichlorobenzidine	10	U	10	1	02/18/20 12:55	2/13/20	
3- and 4-Methylphenol Coelution	10	U	10	1	02/18/20 12:55	2/13/20	
3-Nitroaniline	50	U	50	1	02/18/20 12:55	2/13/20	
4,6-Dinitro-2-methylphenol	50	U	50	1	02/18/20 12:55	2/13/20	
4-Bromophenyl Phenyl Ether	10	U	10	1	02/18/20 12:55	2/13/20	
4-Chloro-3-methylphenol	10	U	10	1	02/18/20 12:55	2/13/20	
4-Chloroaniline	10	U	10	1	02/18/20 12:55	2/13/20	
4-Chlorophenyl Phenyl Ether	10	U	10	1	02/18/20 12:55	2/13/20	
4-Nitroaniline	50	U	50	1	02/18/20 12:55	2/13/20	
4-Nitrophenol	50	U	50	1	02/18/20 12:55	2/13/20	
Acenaphthene	10	U	10	1	02/18/20 12:55	2/13/20	
Acenaphthylene	10	U	10	1	02/18/20 12:55	2/13/20	
Anthracene	10	U	10	1	02/18/20 12:55	2/13/20	
Benz(a)anthracene	10	U	10	1	02/18/20 12:55	2/13/20	
Benzo(a)pyrene	10	U	10	1	02/18/20 12:55	2/13/20	
Benzo(b)fluoranthene	10	U	10	1	02/18/20 12:55	2/13/20	
Benzo(g,h,i)perylene	10	U	10	1	02/18/20 12:55	2/13/20	
Benzo(k)fluoranthene	10	U	10	1	02/18/20 12:55	2/13/20	
Benzyl Alcohol	10	U	10	1	02/18/20 12:55	2/13/20	
2,2'-Oxybis(1-chloropropane)	10	U	10	1	02/18/20 12:55	2/13/20	
Bis(2-chloroethoxy)methane	10	U	10	1	02/18/20 12:55	2/13/20	
Bis(2-chloroethyl) Ether	10	U	10	1	02/18/20 12:55	2/13/20	
Bis(2-ethylhexyl) Phthalate	10	U	10	1	02/18/20 12:55	2/13/20	
Butyl Benzyl Phthalate	10	U	10	1	02/18/20 12:55	2/13/20	
Carbazole	10	U	10	1	02/18/20 12:55	2/13/20	
Chrysene	10	U	10	1	02/18/20 12:55	2/13/20	

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	RQ2001428-01	**Basis:**	NA

Semivolatile Organic Compounds by GC/MS

Analysis Method: 8270D
Prep Method: EPA 3510C

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
Di-n-butyl Phthalate	10	U	10	1	02/18/20 12:55	2/13/20	
Di-n-octyl Phthalate	10	U	10	1	02/18/20 12:55	2/13/20	
Dibenz(a,h)anthracene	10	U	10	1	02/18/20 12:55	2/13/20	
Dibenzofuran	10	U	10	1	02/18/20 12:55	2/13/20	
Diethyl Phthalate	10	U	10	1	02/18/20 12:55	2/13/20	
Dimethyl Phthalate	10	U	10	1	02/18/20 12:55	2/13/20	
Fluoranthene	10	U	10	1	02/18/20 12:55	2/13/20	
Fluorene	10	U	10	1	02/18/20 12:55	2/13/20	
Hexachlorobenzene	10	U	10	1	02/18/20 12:55	2/13/20	
Hexachlorobutadiene	10	U	10	1	02/18/20 12:55	2/13/20	
Hexachlorocyclopentadiene	10	U	10	1	02/18/20 12:55	2/13/20	
Hexachloroethane	10	U	10	1	02/18/20 12:55	2/13/20	
Indeno(1,2,3-cd)pyrene	10	U	10	1	02/18/20 12:55	2/13/20	
Isophorone	10	U	10	1	02/18/20 12:55	2/13/20	
N-Nitrosodi-n-propylamine	10	U	10	1	02/18/20 12:55	2/13/20	
N-Nitrosodimethylamine	10	U	10	1	02/18/20 12:55	2/13/20	
N-Nitrosodiphenylamine	10	U	10	1	02/18/20 12:55	2/13/20	
Naphthalene	10	U	10	1	02/18/20 12:55	2/13/20	
Nitrobenzene	10	U	10	1	02/18/20 12:55	2/13/20	
Pentachlorophenol (PCP)	50	U	50	1	02/18/20 12:55	2/13/20	
Phenanthrene	10	U	10	1	02/18/20 12:55	2/13/20	
Phenol	10	U	10	1	02/18/20 12:55	2/13/20	
Pyrene	10	U	10	1	02/18/20 12:55	2/13/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4,6-Tribromophenol	56	35 - 141	02/18/20 12:55	
2-Fluorobiphenyl	55	31 - 118	02/18/20 12:55	
2-Fluorophenol	28	10 - 105	02/18/20 12:55	
Nitrobenzene-d5	52	31 - 110	02/18/20 12:55	
Phenol-d6	19	10 - 107	02/18/20 12:55	
p-Terphenyl-d14	61	10 - 165	02/18/20 12:55	

Client: Test Assured Network
Project: Eagle Harbor Sand and Gravel
Sample Matrix: Water

Service Request: R2001189
Date Analyzed: 02/18/20

Duplicate Lab Control Sample Summary
Semivolatile Organic Compounds by GC/MS

Units:ug/L
Basis:NA

		Lab Control Sample RQ2001428-02			Duplicate Lab Control Sample RQ2001428-03					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
1,2,4-Trichlorobenzene	8270D	27.9	50.0	56	30.7	50.0	61	10-127	9	30
1,2-Dichlorobenzene	8270D	27.5	50.0	55	29.1	50.0	58	23-130	5	30
1,3-Dichlorobenzene	8270D	26.7	50.0	53	28.5	50.0	57	21-90	7	30
1,4-Dichlorobenzene	8270D	27.0	50.0	54	29.1	50.0	58	10-124	7	30
2,4,5-Trichlorophenol	8270D	34.9	50.0	70	35.8	50.0	72	48-134	3	30
2,4,6-Trichlorophenol	8270D	34.3	50.0	69	34.9	50.0	70	44-135	1	30
2,4-Dichlorophenol	8270D	32.0	50.0	64	33.2	50.0	66	48-127	3	30
2,4-Dimethylphenol	8270D	29.6	50.0	59	30.1	50.0	60	59-113	2	30
2,4-Dinitrophenol	8270D	28.0 J	50.0	56	28.7 J	50.0	57	21-154	2	30
2,4-Dinitrotoluene	8270D	38.0	50.0	76	40.4	50.0	81	54-130	6	30
2,6-Dinitrotoluene	8270D	36.4	50.0	73	39.4	50.0	79	51-127	8	30
2-Chloronaphthalene	8270D	31.8	50.0	64	33.7	50.0	67	40-108	5	30
2-Chlorophenol	8270D	27.4	50.0	55	27.6	50.0	55	42-112	<1	30
2-Methylnaphthalene	8270D	30.6	50.0	61	33.0	50.0	66	34-102	8	30
2-Methylphenol	8270D	25.6	50.0	51	24.7	50.0	49	47-100	4	30
2-Nitroaniline	8270D	33.4 J	50.0	67	35.7 J	50.0	71	52-133	6	30
2-Nitrophenol	8270D	34.3	50.0	69	37.1	50.0	74	43-131	7	30
3,3'-Dichlorobenzidine	8270D	30.3	50.0	61	30.3	50.0	61	43-126	<1	30
3- and 4-Methylphenol Coelution	8270D	23.8	50.0	48	22.0	50.0	44	40-92	9	30
3-Nitroaniline	8270D	28.2 J	50.0	56	29.2 J	50.0	58	42-111	4	30
4,6-Dinitro-2-methylphenol	8270D	34.5 J	50.0	69	34.5 J	50.0	69	36-152	<1	30
4-Bromophenyl Phenyl Ether	8270D	29.9	50.0	60	31.4	50.0	63	48-114	5	30
4-Chloro-3-methylphenol	8270D	30.5	50.0	61	29.6	50.0	59	52-113	3	30
4-Chloroaniline	8270D	25.7	50.0	51	27.6	50.0	55	44-109	8	30
4-Chlorophenyl Phenyl Ether	8270D	29.7	50.0	59	31.9	50.0	64	51-107	8	30
4-Nitroaniline	8270D	33.3 J	50.0	67	35.6 J	50.0	71	54-133	6	30
4-Nitrophenol	8270D	15.2 J	50.0	30	15.8 J	50.0	32	10-126	6	30
Acenaphthene	8270D	33.0	50.0	66	34.9	50.0	70	52-107	6	30
Acenaphthylene	8270D	35.1	50.0	70	37.7	50.0	75	55-109	7	30
Anthracene	8270D	34.4	50.0	69	35.4	50.0	71	55-116	3	30
Benz(a)anthracene	8270D	33.0	50.0	66	34.2	50.0	68	61-121	3	30
Benzo(a)pyrene	8270D	37.7	50.0	75	38.5	50.0	77	44-114	3	30
Benzo(b)fluoranthene	8270D	33.4	50.0	67	36.5	50.0	73	62-115	9	30

Client: Test Assured Network
Project: Eagle Harbor Sand and Gravel
Sample Matrix: Water

Service Request: R2001189
Date Analyzed: 02/18/20

Duplicate Lab Control Sample Summary
Semivolatile Organic Compounds by GC/MS

Units: ug/L
Basis: NA

Analyte Name	Analytical Method	Lab Control Sample RQ2001428-02 Result	Spike Amount	% Rec	Duplicate Lab Control Sample RQ2001428-03 Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Benzo(g,h,i)perylene	8270D	35.8	50.0	72	37.3	50.0	75	63-136	4	30
Benzo(k)fluoranthene	8270D	36.5	50.0	73	37.9	50.0	76	49-133	4	30
Benzyl Alcohol	8270D	27.5	50.0	55	28.9	50.0	58	31-109	5	30
2,2'-Oxybis(1-chloropropane)	8270D	22.2	50.0	44	24.2	50.0	48	32-122	9	30
Bis(2-chloroethoxy)methane	8270D	27.5	50.0	55	30.6	50.0	61	55-110	10	30
Bis(2-chloroethyl) Ether	8270D	24.8	50.0	50	26.8	50.0	54	46-102	8	30
Bis(2-ethylhexyl) Phthalate	8270D	36.7	50.0	73	39.4	50.0	79	51-132	8	30
Butyl Benzyl Phthalate	8270D	34.6	50.0	69	35.6	50.0	71	41-148	3	30
Carbazole	8270D	36.2	50.0	72	37.9	50.0	76	56-139	5	30
Chrysene	8270D	33.0	50.0	66	34.5	50.0	69	57-118	4	30
Di-n-butyl Phthalate	8270D	37.7	50.0	75	38.7	50.0	77	57-128	3	30
Di-n-octyl Phthalate	8270D	35.7	50.0	71	38.7	50.0	77	62-124	8	30
Dibenz(a,h)anthracene	8270D	29.8	50.0	60	31.3	50.0	63	54-135	5	30
Dibenzofuran	8270D	34.8	50.0	70	36.9	50.0	74	55-110	6	30
Diethyl Phthalate	8270D	34.6	50.0	69	37.0	50.0	74	53-113	7	30
Dimethyl Phthalate	8270D	33.1	50.0	66	34.7	50.0	69	51-112	4	30
Fluoranthene	8270D	34.8	50.0	70	35.4	50.0	71	66-127	1	30
Fluorene	8270D	32.3	50.0	65	34.6	50.0	69	54-106	6	30
Hexachlorobenzene	8270D	34.1	50.0	68	34.3	50.0	69	53-123	1	30
Hexachlorobutadiene	8270D	29.0	50.0	58	33.0	50.0	66	16-95	13	30
Hexachlorocyclopentadiene	8270D	26.5	50.0	53	26.8	50.0	54	10-99	2	30
Hexachloroethane	8270D	25.3	50.0	51	26.3	50.0	53	15-92	4	30
Indeno(1,2,3-cd)pyrene	8270D	36.2	50.0	72	37.0	50.0	74	62-137	3	30
Isophorone	8270D	24.5	50.0	49 *	26.5	50.0	53	50-116	8	30
N-Nitrosodi-n-propylamine	8270D	30.5	50.0	61	31.7	50.0	63	49-115	3	30
N-Nitrosodimethylamine	8270D	19.1	50.0	38	21.9	50.0	44	31-70	15	30
N-Nitrosodiphenylamine	8270D	36.6	50.0	73	38.2	50.0	76	45-123	4	30
Naphthalene	8270D	28.5	50.0	57	30.9	50.0	62	38-99	8	30
Nitrobenzene	8270D	26.2	50.0	52	29.4	50.0	59	46-108	13	30
Pentachlorophenol (PCP)	8270D	24.7 J	50.0	49	25.6 J	50.0	51	29-164	4	30
Phenanthrene	8270D	33.9	50.0	68	35.1	50.0	70	58-118	3	30
Phenol	8270D	12.2	50.0	24	12.8	50.0	26	10-113	8	30
Pyrene	8270D	37.1	50.0	74	38.5	50.0	77	61-122	4	30

Semivolatile Organic Compounds by GC

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: Test Assured Network **Service Request:** R2001189
Project: Eagle Harbor Sand and Gravel
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Organochlorine Pesticides by Gas Chromatography

Analysis Method: 8081B
Extraction Method: EPA 3510C

Sample Name	Lab Code	Decachlorobiphenyl 10-164	Tetrachloro-m-xylene 10-147
PW-1A	R2001189-001	44	73
Method Blank	RQ2001426-01	39	75
Lab Control Sample	RQ2001426-02	42	78
Duplicate Lab Control Sample	RQ2001426-03	45	81

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	RQ2001426-01	**Basis:**	NA

Organochlorine Pesticides by Gas Chromatography

Analysis Method: 8081B
Prep Method: EPA 3510C

Analyte Name	Result		MRL	Dil.	Date Analyzed	Date Extracted	Q
4,4'-DDD	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
4,4'-DDE	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
4,4'-DDT	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
Aldrin	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
Dieldrin	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
Endosulfan I	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
Endosulfan II	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
Endosulfan Sulfate	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
Endrin	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
Endrin Aldehyde	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
Endrin Ketone	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
Heptachlor	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
Heptachlor Epoxide	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
Methoxychlor	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
Toxaphene	0.50	U	0.50	1	02/20/20 03:27	2/13/20	
alpha-BHC	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
alpha-Chlordane	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
beta-BHC	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
delta-BHC	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
gamma-BHC (Lindane)	0.050	U	0.050	1	02/20/20 03:27	2/13/20	
gamma-Chlordane	0.050	U	0.050	1	02/20/20 03:27	2/13/20	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
Decachlorobiphenyl	39	10 - 164	02/20/20 03:27	
Tetrachloro-m-xylene	75	10 - 147	02/20/20 03:27	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Analyzed:**	02/20/20
Sample Matrix:	Water		

Duplicate Lab Control Sample Summary
Organochlorine Pesticides by Gas Chromatography

Units: ug/L
Basis: NA

		Lab Control Sample RQ2001426-02			Duplicate Lab Control Sample RQ2001426-03					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
4,4'-DDD	8081B	0.222	0.200	111	0.219	0.200	110	42-159	1	30
4,4'-DDE	8081B	0.191	0.200	95	0.189	0.200	95	47-147	<1	30
4,4'-DDT	8081B	0.200	0.200	100	0.204	0.200	102	41-149	2	30
Aldrin	8081B	0.176	0.200	88	0.181	0.200	90	22-137	3	30
Dieldrin	8081B	0.204	0.200	102	0.195	0.200	98	52-144	4	30
Endosulfan I	8081B	0.179	0.200	90	0.176	0.200	88	52-136	2	30
Endosulfan II	8081B	0.199	0.200	100	0.194	0.200	97	57-138	3	30
Endosulfan Sulfate	8081B	0.189	0.200	94	0.194	0.200	97	34-156	3	30
Endrin	8081B	0.212	0.200	106	0.207	0.200	104	56-143	2	30
Endrin Aldehyde	8081B	0.106	0.200	53	0.107	0.200	54	10-166	<1	30
Endrin Ketone	8081B	0.196	0.200	98	0.197	0.200	98	59-143	<1	30
Heptachlor	8081B	0.187	0.200	93	0.190	0.200	95	32-141	2	30
Heptachlor Epoxide	8081B	0.192	0.200	96	0.192	0.200	96	51-143	<1	30
Methoxychlor	8081B	0.216	0.200	108	0.219	0.200	109	56-149	1	30
alpha-BHC	8081B	0.190	0.200	95	0.193	0.200	97	36-151	2	30
alpha-Chlordane	8081B	0.189	0.200	95	0.190	0.200	95	50-139	<1	30
beta-BHC	8081B	0.189	0.200	95	0.192	0.200	96	55-149	1	30
delta-BHC	8081B	0.200	0.200	100	0.201	0.200	101	29-159	<1	30
gamma-BHC (Lindane)	8081B	0.191	0.200	96	0.194	0.200	97	41-149	1	30
gamma-Chlordane	8081B	0.190	0.200	95	0.190	0.200	95	50-140	<1	30

Metals

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	R2001189-MB		

Inorganic Parameters

Analyte Name	Analysis Method	Result		Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Aluminum, Total	200.7	100	U	ug/L	100	1	02/12/20 20:25	02/12/20	
Calcium, Total	200.7	1000	U	ug/L	1000	1	02/12/20 20:25	02/12/20	
Iron, Total	200.7	100	U	ug/L	100	1	02/12/20 20:25	02/12/20	
Magnesium, Total	200.7	1000	U	ug/L	1000	1	02/12/20 20:25	02/12/20	
Manganese, Total	200.7	10	U	ug/L	10	1	02/12/20 20:25	02/12/20	
Potassium, Total	200.7	2000	U	ug/L	2000	1	02/12/20 20:25	02/12/20	
Sodium, Total	200.7	1000	U	ug/L	1000	1	02/12/20 20:25	02/12/20	
Zinc, Total	200.7	20	U	ug/L	20	1	02/12/20 20:25	02/12/20	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Analyzed:**	02/12/20
Sample Matrix:	Water		

Lab Control Sample Summary
Inorganic Parameters

Units:ug/L
Basis:NA

Lab Control Sample
R2001189-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Aluminum, Total	200.7	1980	2000	99	85-115
Calcium, Total	200.7	1800	2000	91	85-115
Iron, Total	200.7	934	1000	93	85-115
Magnesium, Total	200.7	1900	2000	97	85-115
Manganese, Total	200.7	497	500	99	85-115
Potassium, Total	200.7	19300	20000	97	85-115
Sodium, Total	200.7	19500	20000	98	85-115
Zinc, Total	200.7	500	500	100	85-115

General Chemistry

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Analytical Report

Client:	Test Assured Network	**Service Request:**	R2001189
Project:	Eagle Harbor Sand and Gravel	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	R2001189-MB		

Inorganic Parameters

Analyte Name	Analysis Method	Result		Units	MRL	Dil.	Date Analyzed	Date Extracted	Q
Alkalinity, Total as CaCO3	SM 2320 B-1997(2011)	2.0	U	mg/L	2.0	1	02/18/20 12:37	NA	
Chloride	300.0	0.20	U	mg/L	0.20	1	02/12/20 12:26	NA	
Nitrate+Nitrite as Nitrogen	353.2	0.050	U	mg/L	0.050	1	02/12/20 10:32	NA	
Nitrogen, Total Kjeldahl (TKN)	351.2	0.20	U	mg/L	0.20	1	02/14/20 14:58	02/13/20	
Phosphorus, Total	365.1	0.050	U	mg/L	0.050	1	02/13/20 19:30	02/12/20	
Solids, Total Suspended (TSS)	SM 2540 D-1997(2011)	1.0	U	mg/L	1.0	1	02/13/20 14:30	NA	
Sulfide	SM 4500-S2-F-2000(2011)	1.0	U	mg/L	1.0	1	02/11/20 07:10	NA	

Client: Test Assured Network
Project: Eagle Harbor Sand and Gravel
Sample Matrix: Water

Service Request: R2001189
Date Collected: 02/06/20
Date Received: 02/10/20
Date Analyzed: 2/12/20

Duplicate Matrix Spike Summary
General Chemistry Parameters

Sample Name: PW-1A
Lab Code: R2001189-001

Units: mg/L
Basis: NA

			Matrix Spike R2001189-001MS			**Duplicate Matrix Spike** R2001189-001DMS					
Analyte Name	**Method**	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Chloride	300.0	12.3	32.9	20.0	103	32.7	20.0	102	90-110	<1	20
Nitrate+Nitrite as Nitrogen	353.2	10.9	15.1	5.00	84 *	15.1	5.00	84 *	90-110	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Test Assured Network
Project: Eagle Harbor Sand and Gravel
Sample Matrix: Water

Service Request: R2001189
Date Analyzed: 02/12/20 - 02/18/20

Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

Lab Control Sample
R2001189-LCS2

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Alkalinity, Total as CaCO3	SM 2320 B-1997(2011)	16.0	20.0	80	80-120
Chloride	300.0	1.97	2.00	98	90-110
Nitrate+Nitrite as Nitrogen	353.2	0.505	0.500	101	90-110
Nitrogen, Total Kjeldahl (TKN)	351.2	2.32	2.50	93	90-110
Phosphorus, Total	365.1	0.717	0.800	90	90-110
Solids, Total Suspended (TSS)	SM 2540 D-1997(2011)	206	214	96	80-120

Client: Test Assured Network
Project: Eagle Harbor Sand and Gravel
Sample Matrix: Water

Service Request: R2001189
Date Analyzed: 02/11/20

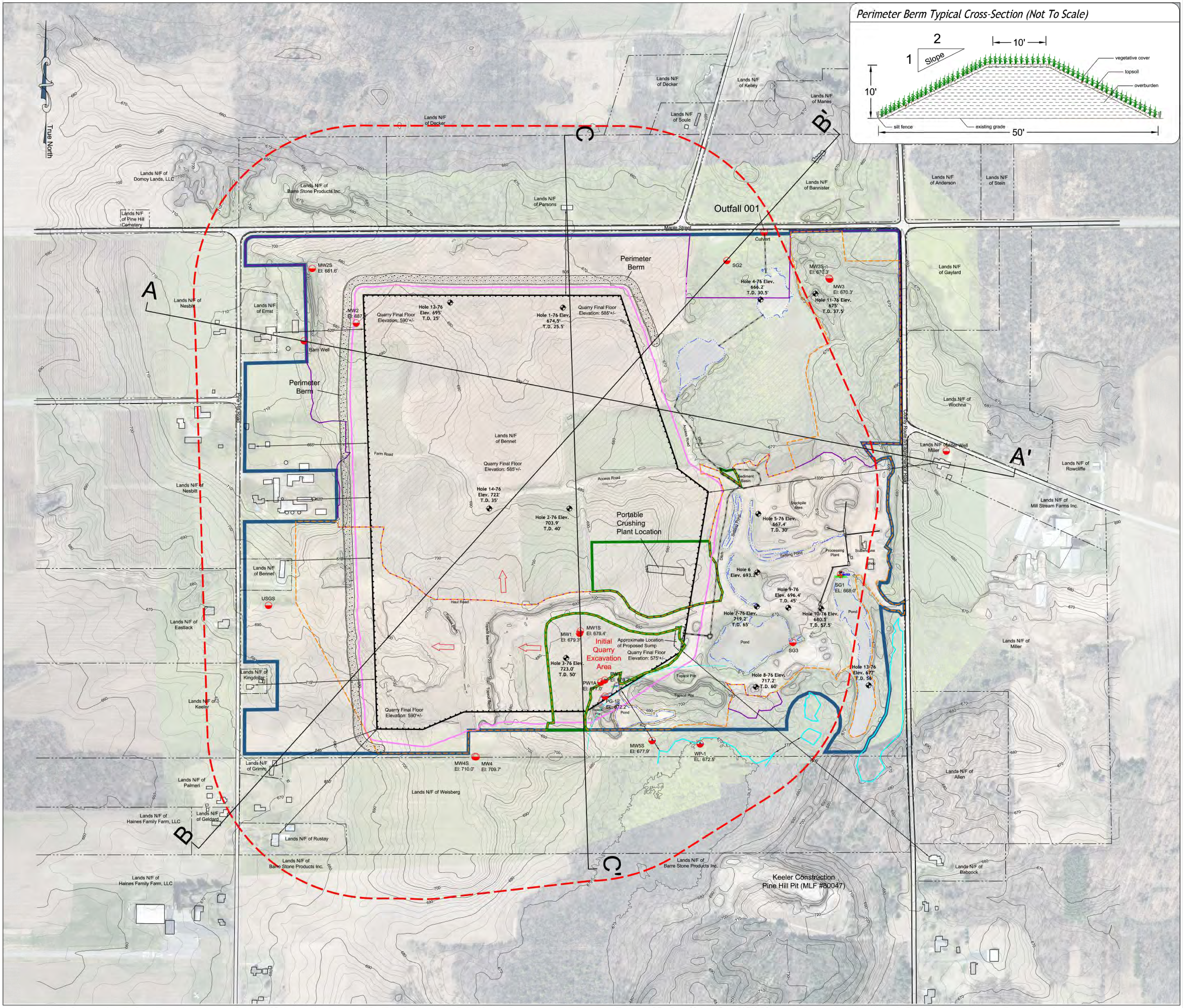
Duplicate Lab Control Sample Summary
General Chemistry Parameters

Units: mg/L
Basis: NA

		Lab Control Sample R2001189-LCS1			Duplicate Lab Control Sample R2001189-DLCS1					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Sulfide	SM 4500-S2-F-2000(2011)	3.22	3.1	105	2.70	3.1	88	67-143	18	20

ATTACHMENT 2

Mining Plan Map



MINING PLAN MAP

Eagle Harbor Mine

NYSDEC Mine ID: 80171

Eagle Harbor Sand & Gravel, Inc.

Town of Barre, Orleans County, New York

Prepared by:
Dean Herrick Consulting Geologists
dhherric@nycap.rr.com
(518) 225-1874
strategic mining solutions
prospecting • planning • permitting • problem solving
Strategic Mining Solutions LLC
Geologists & Mining Consultants
473 Brockway Road / Frankfort, New York 13340
David Shank 315.725.5734 dave@miningstrategy.com
Brian Milliman 315.725.6259 brian@miningstrategy.com

Details:
Date: August 17, 2016
Horizontal Scale: 1" = 200'
Datum: Mean Sea Level
USGS Quad: Knowlesville
Contour Interval: 2 feet
Drafted by: Milliman

REVISIONS

Date	Description	By
1/11/18	Update Bedrock Excavation Area	BTM
6/5/18	Topographic Update	BTM
12/13/18	Update for Permit Modification	BTM
2/6/19	Update for NOIA	BTM
8/22/19	Update for NOIA	BTM
3/6/20	Add pond and monitoring points	BTM

LEGEND

- Property Line
- Life of Mine Boundary
- 10' Contour Line (680)
- 2' Contour Line
- Stream/Edge of Water
- Structure
- Unpaved Road
- Paved Road
- Stormwater Conveyance
- Federal Wetland Boundary
- 425' Federal Wetland Setback
- Monitoring Well (MW1S El: 679.4')
- Direction of Mining
- 1000' Quarry Setback

SCALE

1" = 200'

200 0 200 400 600 800

NOTES

Base Maps & Background Information

1. Life of Mine derived from: Eagle Harbor Sand & Gravel, Inc. Eagle Harbor Mine Site Mining Plan Map by Advanced Environmental Geology, dated: 7/18/2014.
2. Property Lines derived from: Eagle Harbor Sand & Gravel, Inc. Eagle Harbor Mine Site Mining Plan Map by Advanced Environmental Geology, dated: 7/18/2014 and Orleans County Tax Maps.
3. Elevation contours outside of survey area derived from LiDAR dataset provided through NYSGIS Clearinghouse available at http://www.orthos.dhses.ny.gov/.
4. Certain map features outside of survey area digitized from digital high resolution aerial orthophotos provided from the National Aerial Imagery Program (NAIP) and the NYSGIS Clearinghouse.

ACREAGE SUMMARY

- Acreage Currently Permitted To Be Affected By Mining Activities During the Current Mining Permit Term: 85.5+/- acres
- Lands Approved As Reclaimed By NYSDEC: 149.4+/- acres
- Reclaimed Lands Within The Life Of Mine To Be Reaffected By Mining Activities During the Current Permit Term: 13.5+/- acres
- Total Lands To Be Affected By Mining Activities During The Permit Term: 99.0+/- acres
- Life Of Mine Area: 250.6+/- acres
- Bedrock Excavation Area: 99.7+/- acres
- Sand Mining/Stripping Area: 114.3+/- acres