



November 11, 2021

Karl Beaster, PG  
Sr. Environmental Advisor  
Enbridge Energy, Limited Partnership  
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Duluth, MN 55802  
karl.beaster@enbridge.com

**Subject: Interim Action Construction Completion Report  
Enbridge Line 13 MP 312, Blackhawk Island Rd Valve Site, Ft. Atkinson, WI  
WDNR BRRTS #02-28-586199**

Dear Mr. Beaster:

WSP USA Inc. (WSP) is pleased to submit the following Interim Action Construction Completion Report for the Line 13 Milepost (MP) 312 Valve Site located at the intersection of Blackhawk Island Road and Westphal Lane near Fort Atkinson, Wisconsin (Site). **Figure 1** shows the Site location.

## INTRODUCTION

### SITE BACKGROUND

On April 26, 2019, during a routine Site inspection by an Enbridge employee, a personal gas monitor alarmed. As outlined in the Interim Action and Site Investigation Report (IASIR), dated January 28, 2021, Enbridge and its contractors conducted response activities to identify the source of the release and remediate the adjacent soil impacts. Enbridge identified the source of the release as a valve leak on Line 13, which transports diluent.

Enbridge and its contractors conducted three excavation events from May 2019 through October 2019 to remediate the soil impacts to the extent feasible. Soil samples collected at the completion of the final excavation activities indicated that some soil impacted by the diluent remained in the sidewalls of the final excavation. However, additional excavation to remove this impacted soil was deemed not feasible due to existing Site infrastructure. One soil boring was advanced in July 2020 to sample the soil and groundwater near the source. The results of the groundwater sample indicated the benzene concentrations exceeded the Wisconsin Department of Natural Resources (WDNR) Generic Residual Contaminant Level (RCL) for the soil-to-groundwater pathway in the soil, and the Wisconsin Administrative Code (WAC) Chapter NR 140 Enforcement Standard (ES) in the groundwater.

Therefore, Enbridge and its contractors developed a Supplemental Site Investigation Work Plan (SSIWP), dated May 4, 2021, and an Interim Action Work Plan (IAWP), dated May 14, 2021, to delineate the extent of soil and groundwater impacts and begin Interim Action to address the impacts while the Supplemental Site Investigation (SSI) was ongoing. The SSIWP was approved by the WDNR in a letter dated May 26, 2021, and the IAWP was approved in a letter dated June 14, 2021.

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During implementation of soil investigation activities proposed in the SSIWP, light non-aqueous phase liquid (LNAPL; “free product”) was identified at the groundwater table in the vicinity of the Site. The identification of free product at the water table necessitated a modification of the Interim Action approach for the Site, and an addendum to the IAWP, dated August 18, 2021 (Addendum), was submitted to the WDNR to summarize the proposed modified Interim Action at the Site. The Addendum was approved by the WDNR in an email dated August 26, 2021. This document summarizes the implementation of the Interim Action proposed in the IAWP and Addendum and presents initial operational data from the Interim Action free product recovery system.

## INTERIM ACTION IMPLEMENTATION

### INVESTIGATION AND WELL INSTALLATION

Between June 7 and 10, 2021, WSP oversaw the advancement of 33 in-situ direct-push High-Resolution Site Characterization (HRSC) soil borings utilizing an Ultra-Violet Optical Screening Tool (UVOST) combined with a Hydraulic Profiling Tool (HPT). In the initial soil borings advanced adjacent to the Line 13 valve, the UVOST detector response indicated the potential presence of free product at the water table at depths between approximately 24 and 28 feet below ground surface (ft bgs). Subsequent HRSC soil borings were advanced to complete the lateral delineation of the UVOST response at the water table and define the area where free product may be present. Between June 10 and 14, 2021, WSP oversaw the advancement of 30 soil confirmation borings, which included lithologic observations of soil cores, field screening of soil using a photoionization detector (PID), and soil sampling for laboratory analysis. The soil sampling results were reported to the WDNR in a letter dated July 12, 2021. As discussed in the Addendum, the number and construction of the remediation wells was changed from what was presented in the IAWP based on these results.

WSP oversaw the installation of nine remediation wells (RW-1 through RW-9) between June 15 and 17, 2021. The remediation wells were installed using hollow-stem auger drilling methods and constructed using 2-inch diameter Sch 40 polyvinyl chloride (PVC) screen and riser and a 15-foot screened interval across the water table from 17 to 32 ft bgs. The wells will also provide access for future groundwater and vadose zone remediation and free product recovery activities. **Figure 2** provides a schematic as-built diagram for remediation wells RW-1 through RW-9. **Figure 3** shows the locations of the installed remediation wells. Remediation well installation was attempted at two additional locations (RW-10 and RW-11) in June 2021 but encountered auger refusal prior to reaching the target depth. These two remediation wells were subsequently installed on August 13, 2021 using roto sonic drilling methods. RW-10 and RW-11 were constructed using 4-inch diameter PVC screen and casing with a 15-foot screened interval from 17 to 32 ft bgs. No measurable free product has been observed in RW-10 or RW-11.

### INITIAL FREE PRODUCT RECOVERY AND EVALUATION

The presence of free product at the water table was confirmed on June 16, 2021. From June 21 through September 2, 2021, WSP conducted manual free product recovery efforts at RW-1 through RW-9. Manual free product recovery activities consisted of WSP personnel measuring depth to free product and depth to water in the remediation wells and pumping free product from the remediation wells using submersible pumps. Recovered free product and segregated groundwater were stored in onsite storage containers with secondary containment. The manual free product recovery efforts recovered approximately 219 gallons of free product. Routine gauging of remediation wells RW-1 through RW-9 between June 28 and August 11, 2021, indicate free product thickness varying from approximately 0.5 to 2.1 feet with the depth to top of free product occurring at approximately 25 ft bgs. No measurable free product has been observed in RW-10 or RW-11; therefore, no manual free product recovery was conducted at those locations.



On June 28 and 29, 2021, WSP conducted free product transmissivity testing at four remediation wells (RW-4, RW-6, RW-7, and RW-9). WSP conducted two tests at each well and used the API LNAPL Transmissivity Workbook to calculate the average LNAPL transmissivity at each well. The wells were selected based on observations during manual product recovery to provide a wide range of results. The average calculated LNAPL transmissivity for the wells ranged from 2.12 square feet per day (ft<sup>2</sup>/d) in RW-4 to 3.78 ft<sup>2</sup>/d in RW-9. The results of the transmissivity testing and observations during manual free product recovery indicated that it is feasible to continue recovering free product.

## **AUTOMATED FREE PRODUCT RECOVERY**

### **SYSTEM CONSTRUCTION**

In order to enhance free product recovery, WSP installed an automated free product recovery system. WSP began the installation of the system on August 23, 2021, and the system was completed and started normal operation on September 7, 2021. **Figure 3** shows the layout of the completed free product recovery system.

The system consists of eight QED Genie Skimmer pumps with external programable controllers deployed in remedial wells RW-1, RW-2, and RW-4 to RW-9. Based on the limited free product thickness and slow product recharge following manual product recovery, remediation well RW-3 was not equipped with a product recovery pump. The proposed system also included pumps in RW-10 and RW-11; however, no free product was observed in those wells, and the product recovery pumps were not installed.

The pumps are pneumatically operated with air supplied by an onsite DeWalt 5-horsepower (hp), 80-gallon stationary air compressor. The air compressor is staged onsite within a temporary shed to protect it from inclement weather and reduce the noise from the compressor at nearby properties. Each remediation well pump has a programmable solar-powered QED C100M controller to control the pump cycle rates. On September 2 and 3, 2021, WSP conducted initial testing of each well to establish the controller settings for each well's observed recovery. **Enclosure A** provides manufacturer's specifications for the QED pumps and controllers.

Recovered free product is pumped from the remediation wells and transferred via aboveground tubing to an onsite storage tank with secondary containment and automated system shut-off controls. There are three separate tanks for the automated system, and the discharge is moved manually from one tank to the next when a tank is full. Recovered free product is transported offsite for reinjection into the pipeline system by Enbridge.

Following startup of the automated system, WSP conducted daily Site visits for the first week to confirm system operation and free product recovery rates, twice weekly Site visits for the second and third weeks, and weekly Site visits starting on the fourth week of system operation. WSP will continue with weekly site visits until the system is shut down due to freezing weather conditions. Since the free product recovery system is being installed and operated as an Interim Action, it is not designed for continuous operation during the winter. As a result, WSP anticipates that the system will be shut down in November 2021 following approximately two to three months of operation (September through November).

### **INITIAL SYSTEM PERFORMANCE**

Through November 8, 2021, the automated system has recovered approximately 406 gallons of free product with no measurable water recovered in the recovery tanks. **Figure 4** shows the product recovery over time starting with the system startup on September 7, 2021.

WSP paused operation of the automated product recovery system on September 21 and October 25, 2021 to measure the remaining product in the active remediation wells. For each measurement event, WSP paused the operations of the remediation wells the day prior to conducting the measurement and allowed the remediation well to recharge for more



than 12 hours. **Figure 5** shows the product thickness in the active remediation wells at six measuring events during manual and automated product recovery. Generally, the measured product thickness in the wells has decreased during the manual and automated free product recovery, with the maximum product thickness being reduced from 2.13 feet (RW-8 and RW-9) on June 28, 2021, to 1.29 feet (RW-9) on October 25, 2021.

The combination of manual and automated product recovery has resulted in a total of approximately 705 gallons recovered to date. We will continue to evaluate the recovered product volume relative to the estimated release volume of 1,225 to 1,386 gallons reported in the Interim Action and Site Investigation Report, dated January 28, 2021.

In accordance with NR 712, Wis. Adm. Code., the certification of an engineer for this Interim Action Construction Completion Report is included in Enclosure B.

Please do not hesitate to contact me if you have questions:

Kind regards,

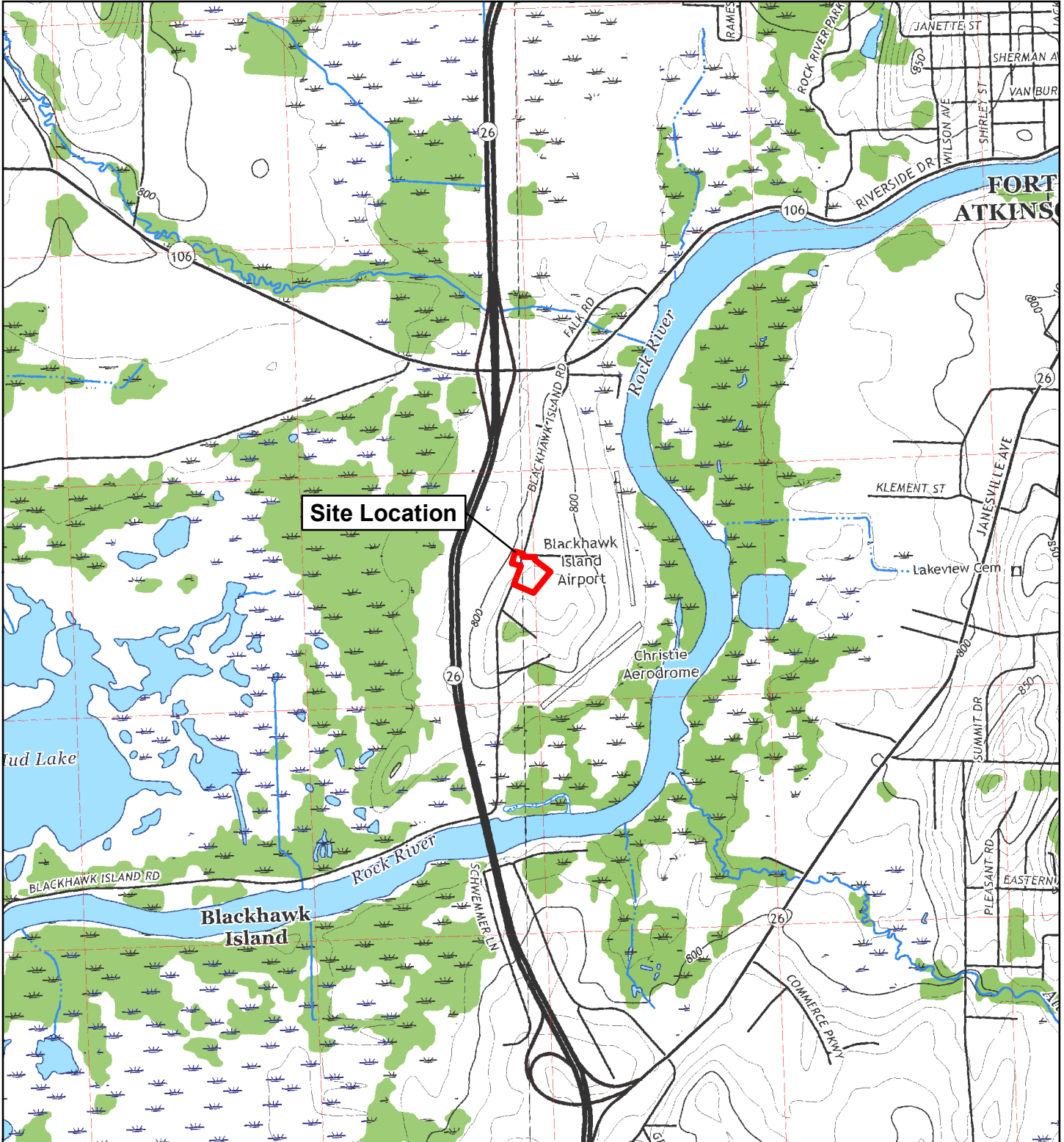
A handwritten signature in black ink that reads "Tim Huff". The signature is written in a cursive, slightly slanted style.

Timothy A. Huff  
Senior Lead Geologist

TAH :  
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Encl.

## FIGURES

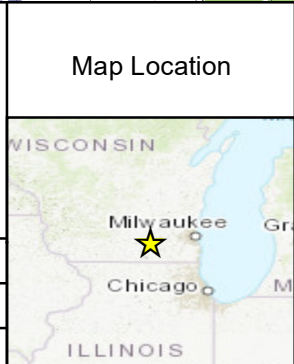


**ENBRIDGE**

Drawn: WSP 4/15/2021

Approved: WSP 4/15/2021

Project #: 31401967.705



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Feet

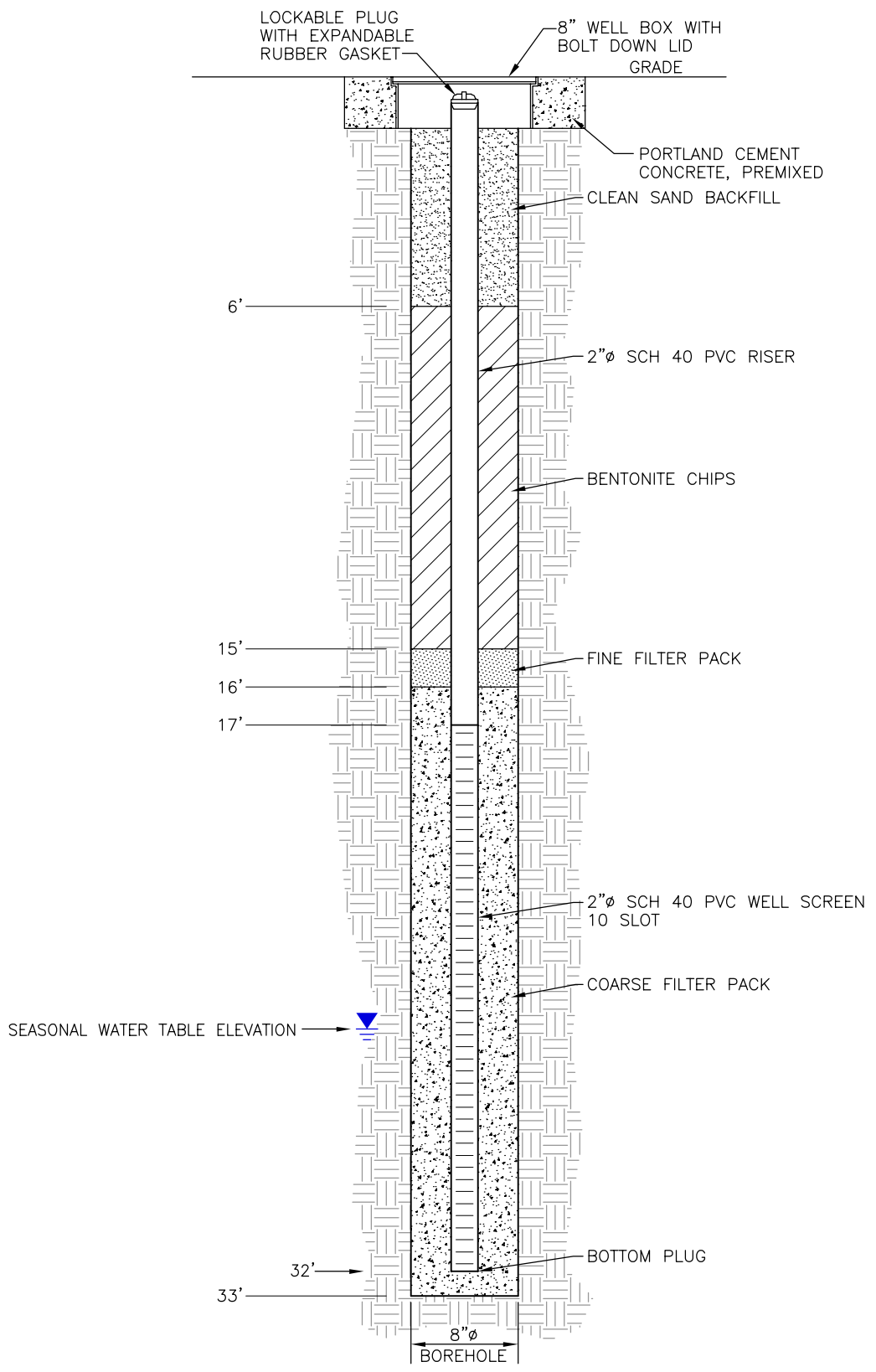
Coordinate System: NAD 1983 StatePlane  
Wisconsin South FIPS 4803 Feet

Source: USGS US Topo 7.5-minute maps for  
Busseyville and Fort Atkinson, WI 2018

FIGURE 1  
SITE LOCATION MAP

FORT ATKINSON VALVE STATION  
LINE 13 MP 312

ENBRIDGE ENERGY  
LIMITED PARTNERSHIP



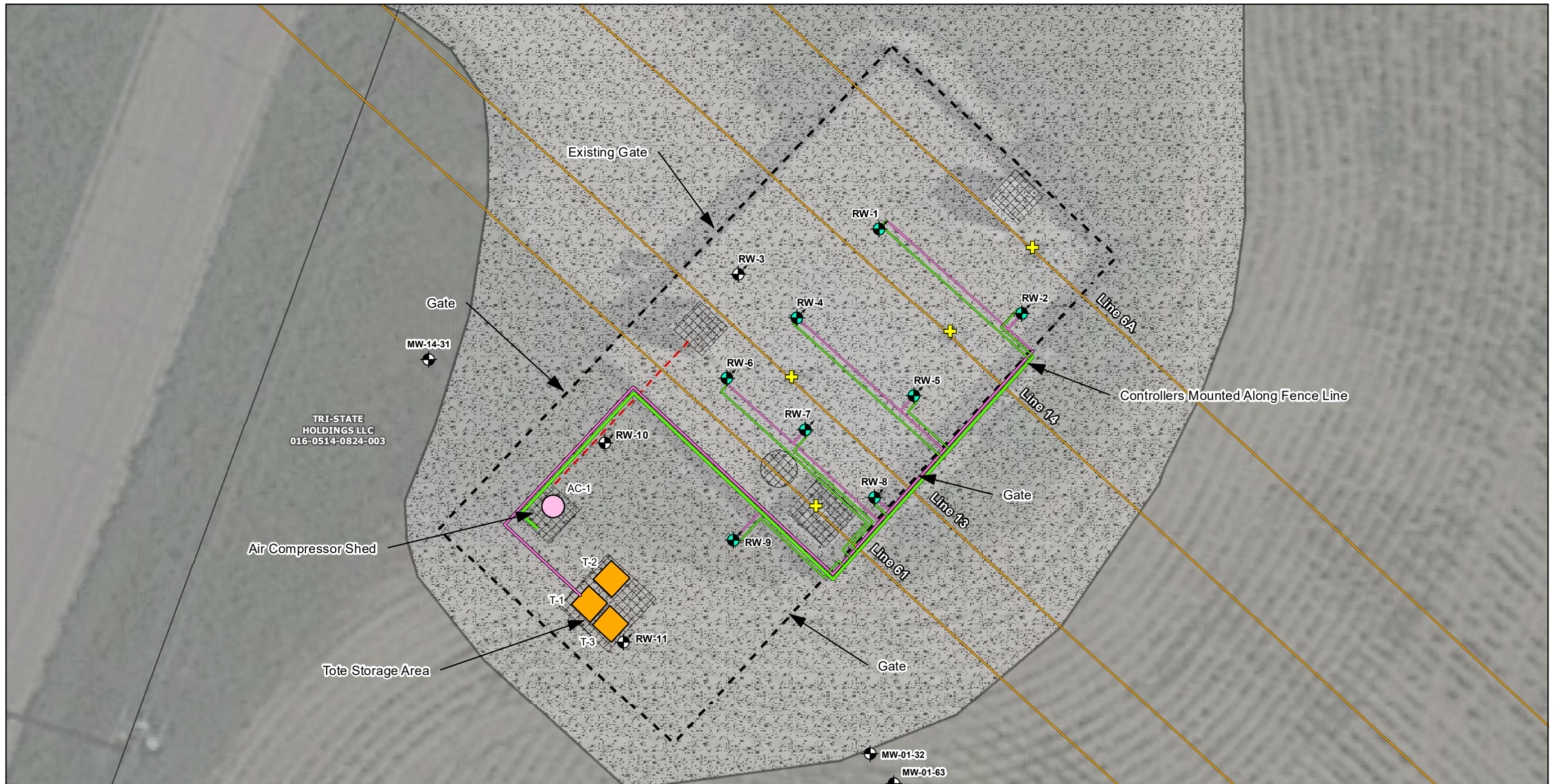
NOT TO SCALE



FIGURE 2  
 REMEDIATION WELL AS-BUILT  
 RW-1 THROUGH RW-9

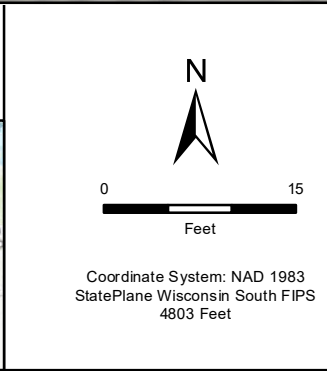
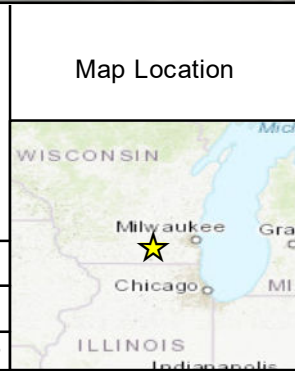
LINE 13 MP 312 VALVE SITE  
 FORT ATKINSON, WISCONSIN  
 PREPARED FOR  
 ENBRIDGE ENERGY LIMITED PARTNERSHIP  
 DULUTH, MINNESOTA





**ENBRIDGE**

Drawn: WSP 10/30/2021  
 Approved: WSP 10/30/2021  
 Project #: 31401967.705



**Legend**

- Remediation Well
- Remediation Well with Product Recovery Pump
- Existing Monitoring Well
- Pipeline Valve
- Compressed Air Lines (At Grade)
- Product Recovery Lines (At Grade)
- Electrical Service (At Grade)
- Enbridge Pipeline (Below Grade)
- Product Recovery Tank with Secondary Containment
- Air Compressor
- Gravel Perimeter
- Site Feature
- Site Fence
- Property Parcels

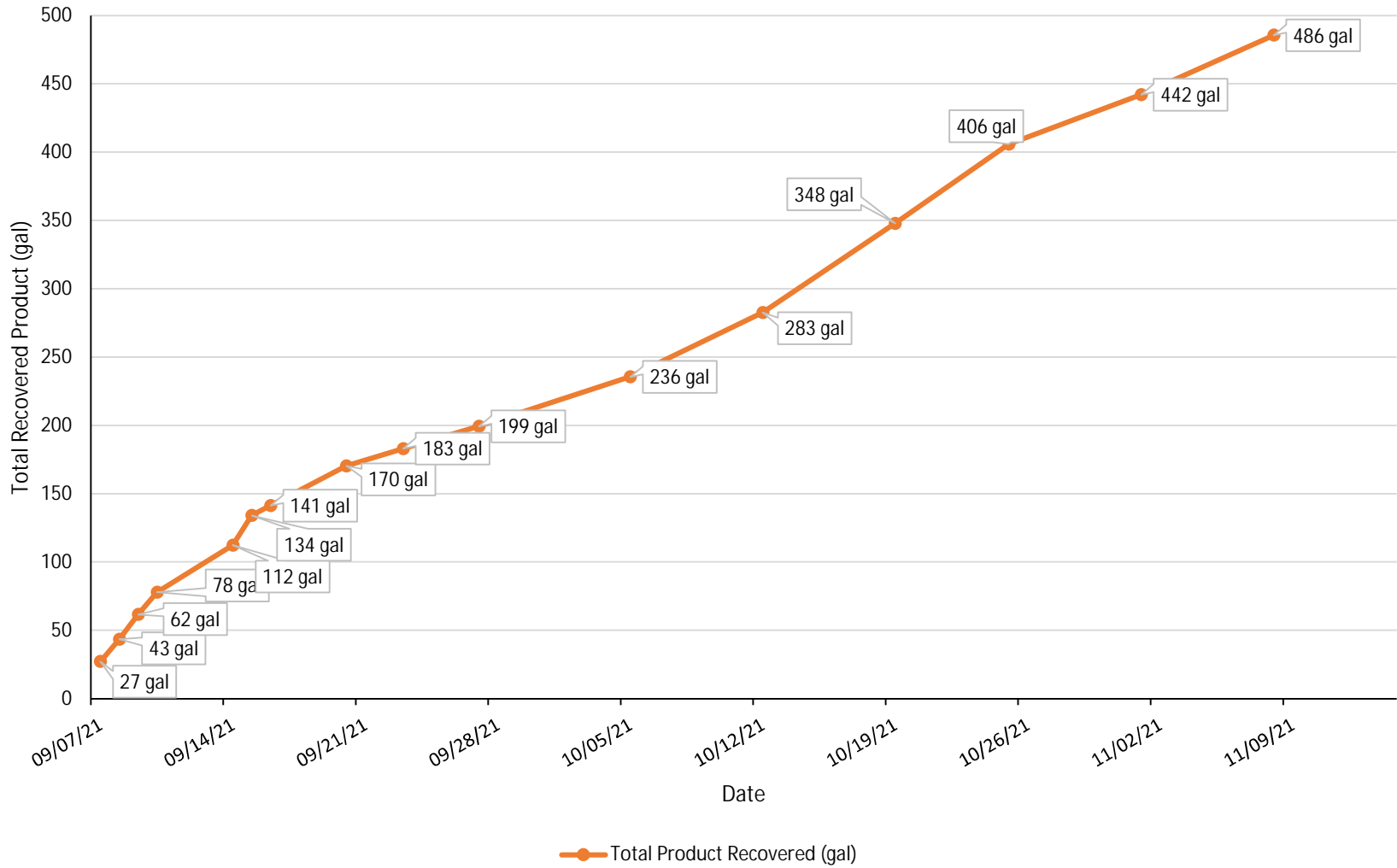
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

**FIGURE 3**  
**PRODUCT RECOVERY SYSTEM DIAGRAM**

LINE 13 MP 312 VALVE SITE  
 FORT ATKINSON, WISCONSIN

ENBRIDGE ENERGY LIMITED PARTNERSHIP





NOTES:

1. Approximately 219 gallons of free product was recovered before the automated system was started up
2. 27.2 gallons of free product was recovered prior to 9/7/21 during system startup and testing.

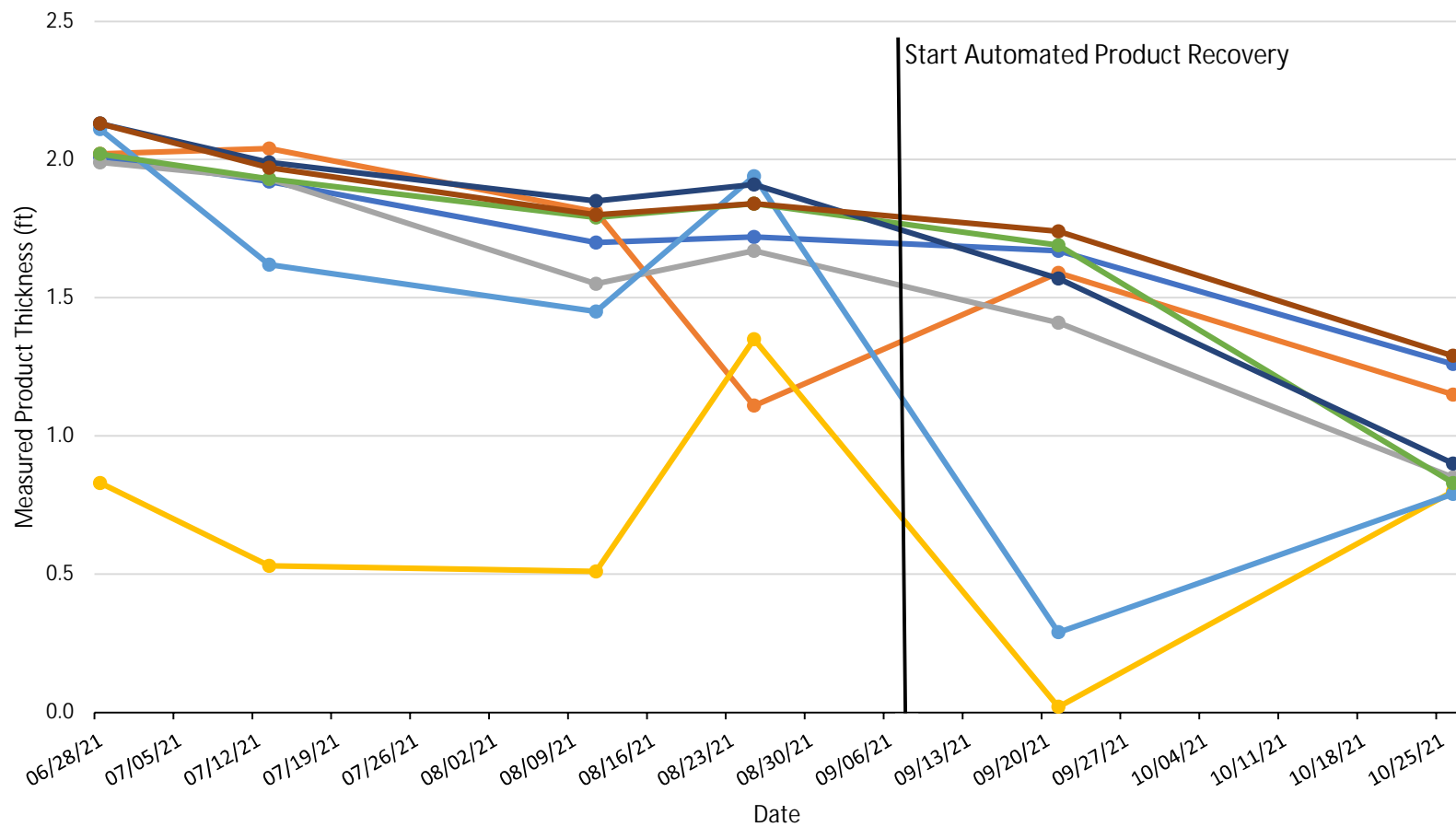
**A**

**WSP**  
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 SUITE D  
 KALAMAZOO, MI 49009  
 TEL: +1 269.459.3935

FIGURE 4  
 AUTOMATED SYSTEM  
 TOTAL PRODUCT RECOVERY

LINE 13 MP 312 VALVE SITE  
 FORT ATKINSON, WISCONSIN  
 PREPARED FOR  
 ENBRIDGE ENERGY, LIMITED PARTNERSHIP

Drawn By:	ESW	11/10/21
Checked:	TAH	11/10/21
Approved:		
File Name:	2021.11.10_L13MP312_PRS-Data.xlsx	




Start Automated Product Recovery

NOTES:

1. Automated product recovery began on 9/7/21.
2. All product thickness measurements followed at least 12 hours without product recovery.

A


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**FIGURE 5**  
**PRODUCT THICKNESS IN REMEDIATION WELLS WITH AUTOMATED RECOVERY SYSTEM**

LINE 13 MP 312 VALVE SITE  
 FORT ATKINSON, WISCONSIN  
 PREPARED FOR  
**ENBRIDGE ENERGY, LIMITED PARTNERSHIP**

Drawn By: ESW 11/08/21  
 Checked:  
 Approved:  
 File Name: 2021.10.05\_L13MP312\_PRS-Data.xlsx

## ENCLOSURE A – QED AUTOGENIE PUMP SPECIFICATIONS



## 2" SPG2 AutoGenie™



### **2" SPG2 AutoGenie™ Skimmer**

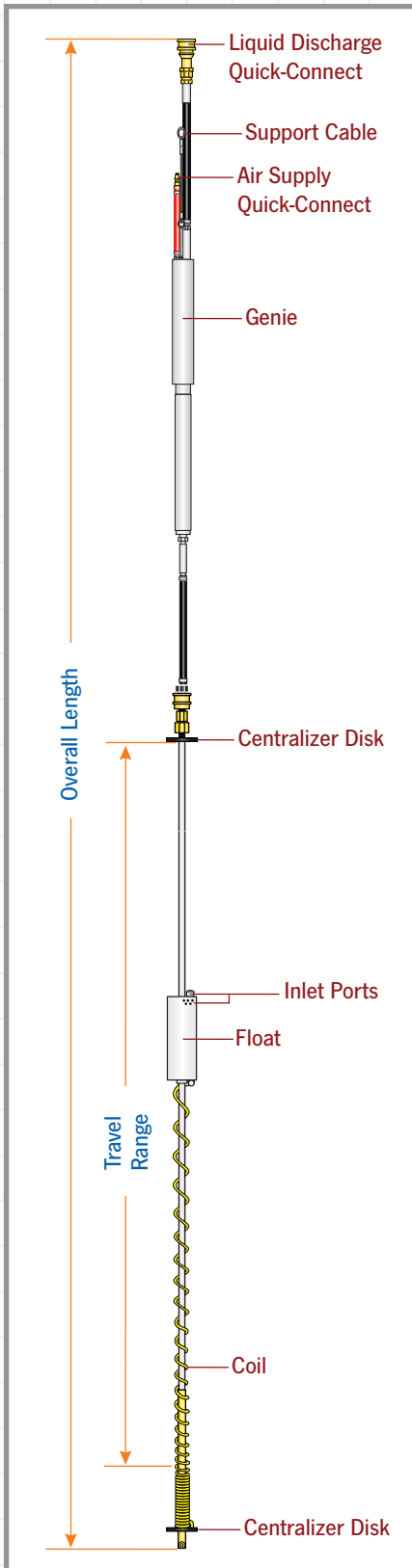
The 2" SPG2 AutoGenie™ is a safe, reliable and complete system designed to remove free product from 2" or larger wells. The 2" SPG2 AutoGenie system consists of an air-powered pumping unit with a floating inlet that tracks changes in the water level. The SPG float uses specific gravity to avoid water intake, and includes multiple inlet hole positions to allow fine-tuning of the inlet level as the floating layer thickness is reduced. The special Genie bladder pump with high suction capacity delivers proven reliability and durability. The AutoGenie uses an integral pneumatic timer to control the bladder pump fill and discharge times. A complete line of accessories is available, including in-well tubing, well caps, LNAPL collection tank full shutoffs, and other items.

### **Warranty**

SPG2 AutoGenies are warranted for one (1) year.

### **Advantages**

- 1. Specialized bladder pump is extremely durable, provides high suction to maintain flow, and eliminates contact of drive air with pumped fluid.**
- 2. Continuous, automatic operation that is 100% air powered.**
- 3. Available in a range of flow rates and float travel ranges to best fit site needs.**
- 4. Low air consumption.**



The 2" SPG2 AutoGenie™ is available in 6 different models with varying inlet float travel ranges and pumping rates. Why so many options? QED has found that each free product site and well can have its own challenges in terms of well depth, liquid column depth, water level fluctuation and desired LNAPL pumping rate. For example, the model with the longest pump and float travel range may be too long for some wells. Check the dimensions and flow rates below, or just call QED's application specialists to help select the best match for your project.

### Specifications

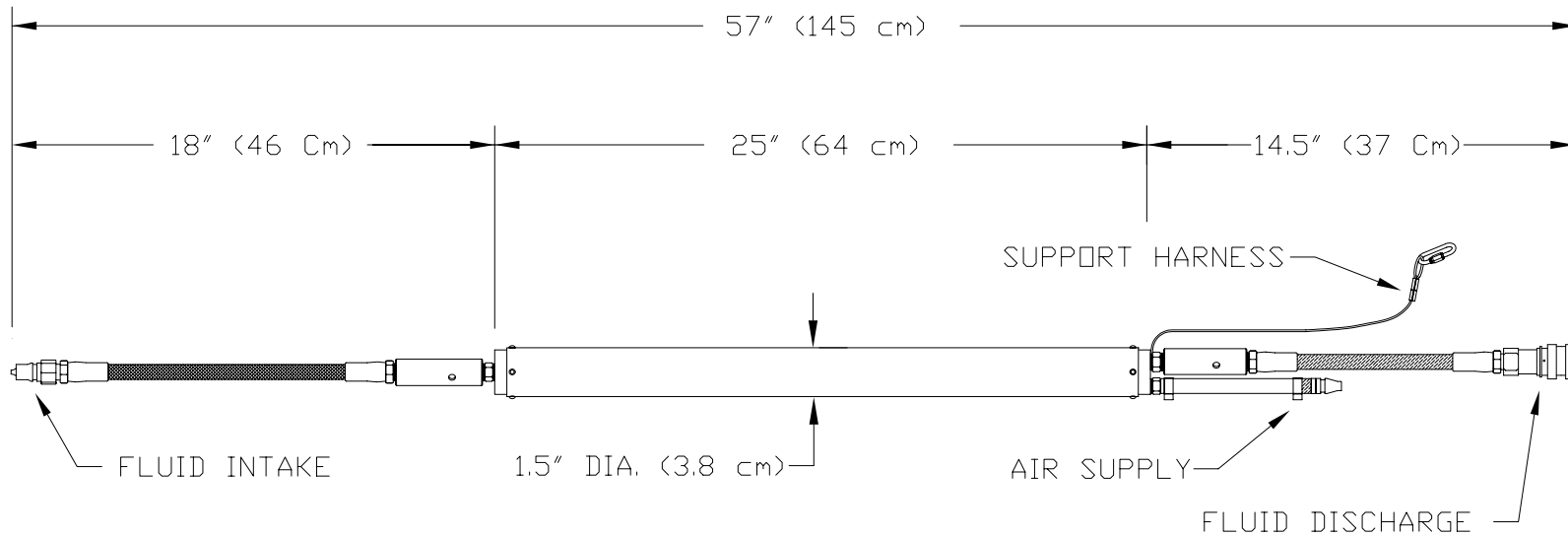
AutoGenie Model	Maximum LNAPL Recovery Rate*	Float Travel Range	Overall Length	Minimum Liquid Column
AG2415 SPG2	160 gpd (605 Lpd)	15 in. (38 cm)	95 in. (241 cm)	6 in. (15 cm)
AG2424 SPG2	160 gpd (605 Lpd)	24 in. (61 cm)	105 in. (267 cm)	12 in. (30 cm)
AG2445 SPG2	160 gpd (605 Lpd)	45 in. (114 cm)	130 in. (330 cm)	15 in. (38 cm)
AG4815 SPG2	320 gpd (1,211 Lpd)	15 in. (38 cm)	118 in. (300 cm)	6 in. (15 cm)
AG4824 SPG2	320 gpd (1,211 Lpd)	24 in. (61 cm)	129 in. (328 cm)	12 in. (30 cm)
AG4845 SPG2	320 gpd (1,211 Lpd)	45 in. (114 cm)	153 in. (389 cm)	15 in. (38 cm)

Minimum Well ID	2 in. (5 cm)
Maximum OD	1.92 in. (4.88 cm)
Maximum Depth	150 ft. (45.7 m)
Air Supply Pressure (min/max)	40/100 psi (2.7/6.9 bar)
LNAPL Fluid Density	< .85 SG
Kinematic Viscosity	1-1000 centistokes
Recommended Initial LNAPL Layer	> 3 in. (> 7.6 cm)
Residual LNAPL Layer	≥ 0.25 in. (.64 cm)
Suitable Types of LNAPL	Gasoline, diesel, jet fuels, kerosene, #2 - #5 fuel oils, light weight motor oil and hydraulic fluid
Materials	Brass, Tygon®, stainless steel, Viton®, Teflon®
Fitting Type	Quick-connect
Hose or Tubing	Both are available

Tygon is a registered trademark of Saint Gobain - Norton. Viton is registered trademark of DuPont Dow Elastomers.

Teflon is a registered trademark of Dupont.

\* gpd = gallons per day, Lpd = liters per day



WEIGHT = 5 Lb (2.27 Kg)

MAXIMUM DEPTH = 150 FT (45.7 M)

MAXIMUM FLUID PER CYCLE = 120 cc

SCF AIR USE PER CYCLE			
AIR PSI	PUMP BODY	1/4" ID X 100 FT AIR LINE	PUMP AND 100 FT 1/4" HOSE
100	0.119	0.232	0.351
80	0.092	0.185	0.277
60	0.071	0.139	0.210



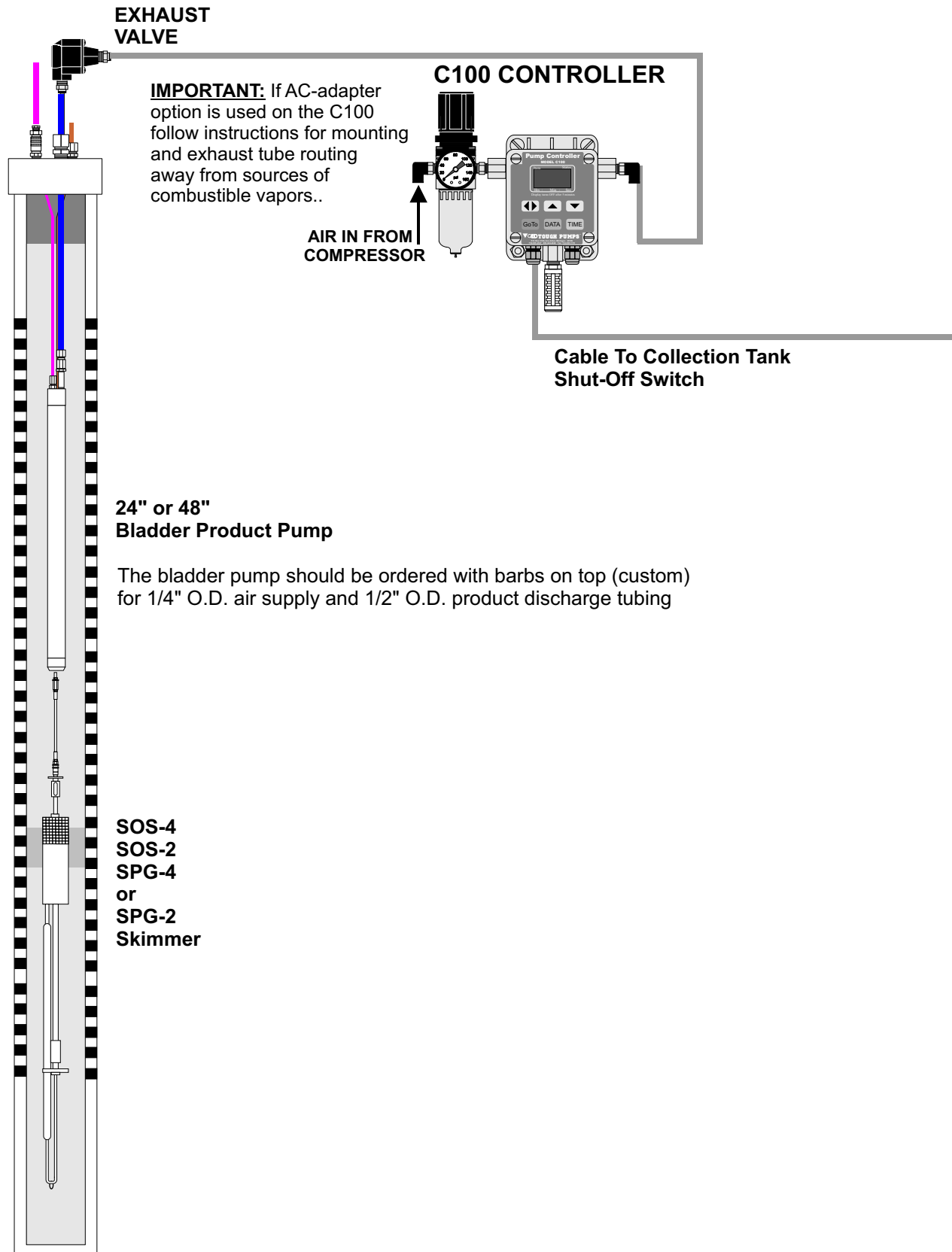
734-995-2547 -US HEADQUARTERS  
 734-995-1170 -FAX  
 800-624-2026 -NORTH AMERICA TOLL FREE  
 WWW.QEDENV.COM -WEB PAGE

TOLERANCES UNLESS OTHERWISE SPECIFIED ANGULAR : .5° FRAC : .XXX : .005 .XX : .01 .XXXX : .0005	APPROVALS	DATE	TITLE 24-INCH PROGRAMMABLE GENIE PART No. 301310	
	DRAWN TONY RAMIREZ DESIGNER R/W	1-14-07	DRAWING No.	602152
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FINISH	APPROVED R/W/RH	1-14-07	SCALE	NONE
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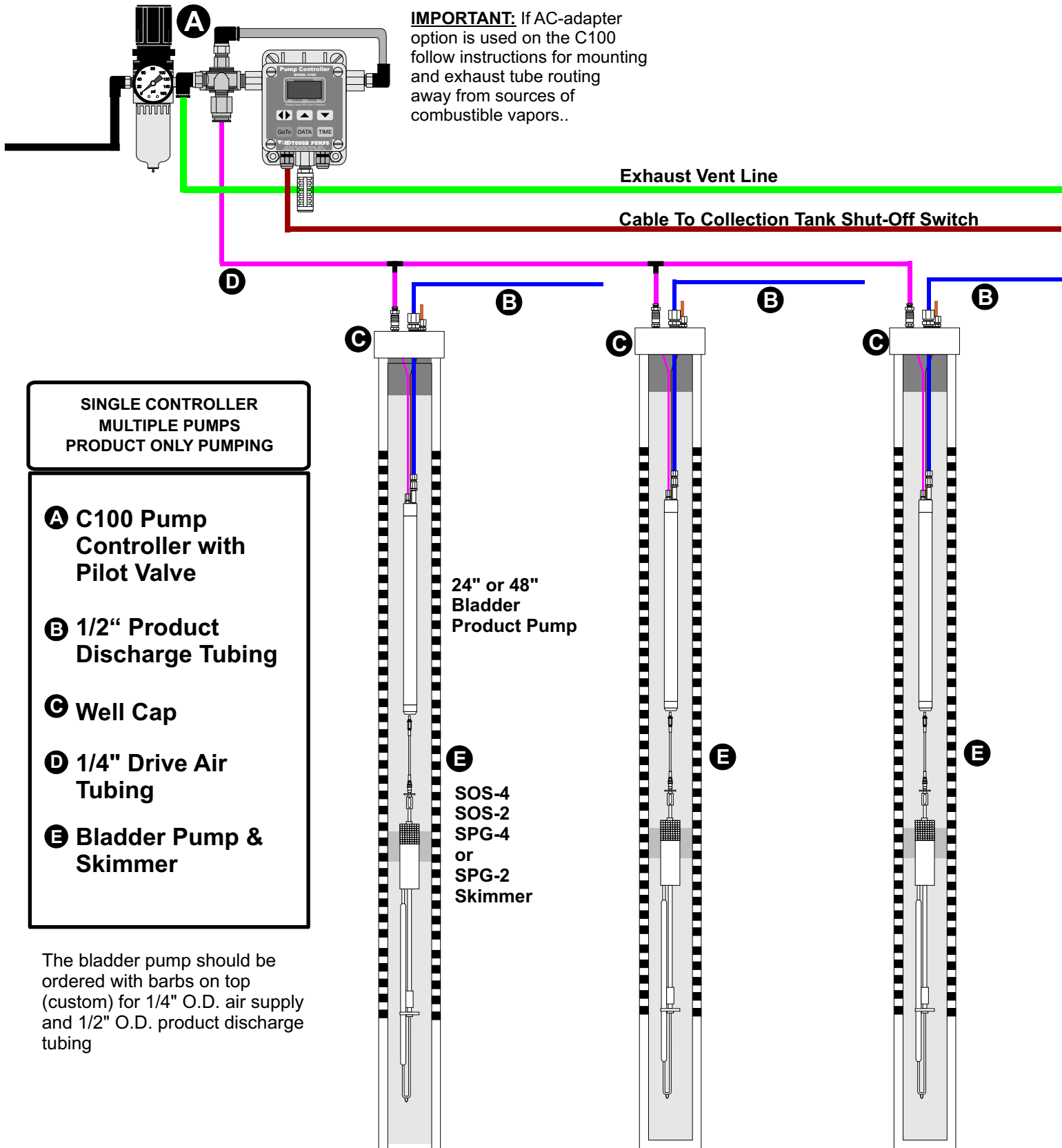


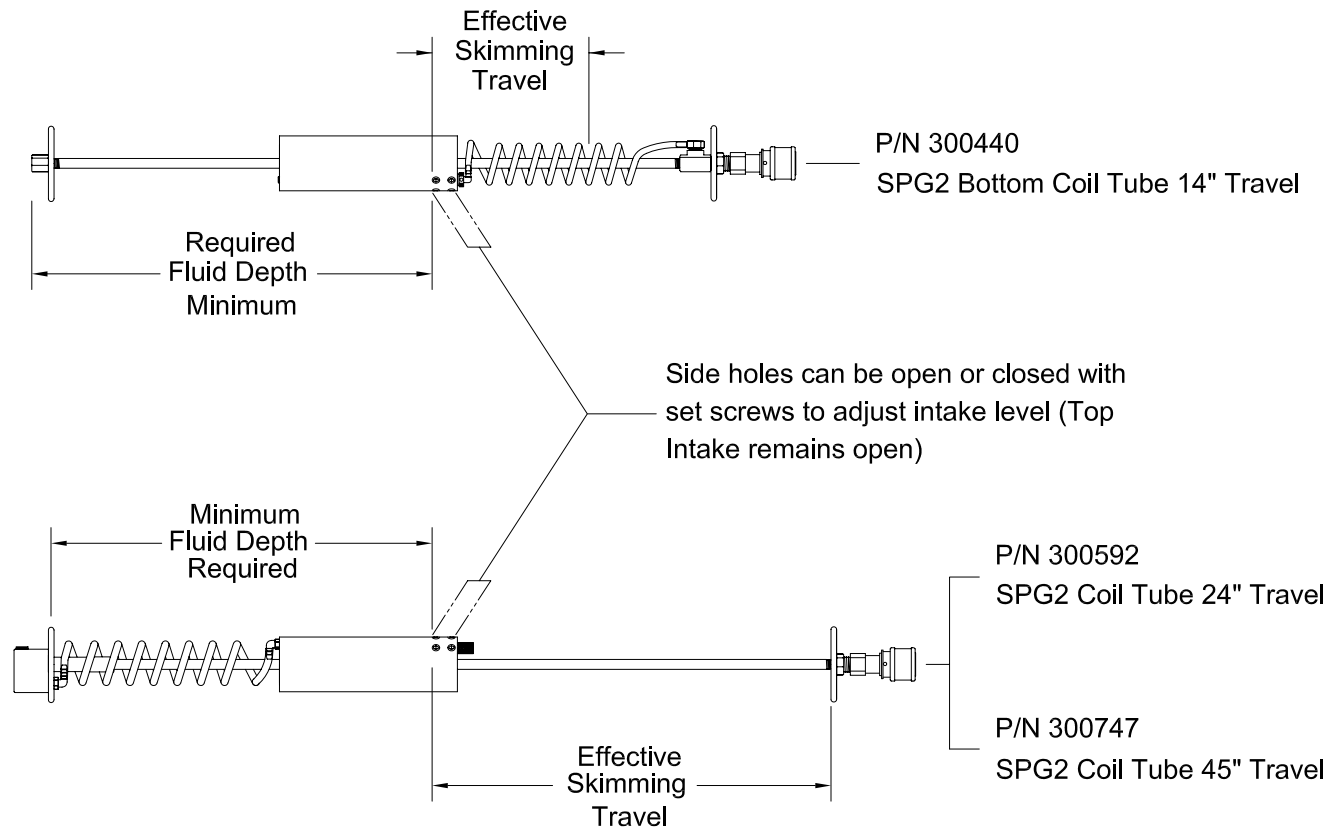
## Single Pump Installation

The drawing below shows a single pump being controlled by a single controller..



## Multiple Pump System with a Pilot Valve





PART #	300440	300592	300747
SPECIFICATIONS			
Minimum Fluid Depth Required	6.3" (16 cm)	12.5" (32 cm)	16" (41 cm)
Effective Skimming Travel	14" (36 cm)	24" (61 cm)	45" (114 cm)
Total Length	28.5" (72 cm)	40.3" (102 cm)	64" (163 cm)
Outside Diameter	1.9" (4.8 cm)	1.9" (4.8 cm)	1.9" (4.8 cm)
Weight	1.4 lbs (.6 Kg)	1.7 lbs (.8 Kg)	2.2 lbs (1.0 Kg)



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 734-995-1170 -FAX  
 800-624-2026 -NORTH AMERICA TOLL FREE  
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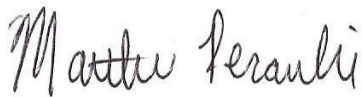
TOLERANCES UNLESS OTHERWISE SPECIFIED		APPROVALS	DATE	TITLE	
FRAC : .XXX : .005	ANGULAR : .5°	DRAWN TONY RAMIREZ	11-12-03	SPG2 SKIMMERS	
.XX : .01	.XXXX : .0005	DESIGNER A. LIQUETE	11-12-03	DRAWING No. 601676	REV 02
MATERIAL	CHECKED MF/RW/SF/ARL	APPROVED MF/RW/SF/ARL	1-23-04	SCALE NONE	SHT OF
FINISH			1-23-04		



## ENCLOSURE B – ENGINEER CERTIFICATION

Interim Action Construction Completion Report  
Enbridge Line 13 MP 312 Valve Site  
Blackhawk Island Road  
Fort Atkinson, Wisconsin  
BRRTS Number: 02-28-586199

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



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Matthew Peramaki, P.E.  
Assistant Vice President, Wisconsin P.E. #31636-006

11/11/2021

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Date