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File: 185751226

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Reference: **Work Plan for Task 3 – Replace Bio-Sparge Treatment System with a Groundwater Pump and Treat System**  
**Tesoro 2Go Mart #76**, 3600 East Palmer Wasilla Highway, Wasilla, Alaska  
ADEC UST Facility #2986, ADEC File #2265.26.037

Dear Ms. Duarte:

This letter presents a work plan prepared by Stantec for the implementation of Task 3 that was proposed in the 2019 Annual Work Plan for Tesoro 2Go Mart #76 located in Wasilla, Alaska. The Work Plan was presented during a meeting with Tesoro and Stantec on December 7, 2018, to Paul Horwath, Project Manager/Engineer with the Alaska Department of Environmental Conservation (ADEC). The Work Plan was subsequently approved by ADEC for implementation.

In 2018 Stantec determined the existing on-site bio-sparge groundwater treatment system was not effective nor functional, and recommended the system be modified with the pump and treat system similar in design and operation as the treatment system currently used at Tesoro 2Go Mart #111 located in Fairbanks, Alaska. Task 3 for this site proposes to replace and retrofit the former bio-sparge treatment system with a ground water pump and treat remediation system that will include the construction of a 4-inch diameter remediation well.

This letter provides a work plan for the installation of the proposed remediation well that will be labeled/identified as "REM Well". The remediation well will be used to capture ground water on the west side of the site and recirculate ground water on a continuous basis into the existing wells that were previously used for the bio-sparge system. The pumped ground water will be treated on a monthly to quarterly basis with chemical oxidants. As shown on Figure 1, the proposed remediation well will be located on the west side of the existing soil vapor extraction (SVE) blower enclosure (Knack box). Figure 2 shows the location of other site improvements including the layout of the bio-sparge air injection wells. The SVE treatment system will remain in operation until such time it is determined no longer effective.

Reference: Task 3 Work Plan for Tesoro 2Go Mart #76

The proposed REM well will be connected via an aboveground insulated manifold system to the three existing buried vertical air injection lines that were previously used for the bio-sparge treatment system. The air injection lines are connected to the three vertical wells (RW1, RW2 and RW3) as shown on Figure 2. The former air lines will be used for delivery/discharge of groundwater pumped from the REM well. The vertical wells consist of 2" diameter PVC slotted pipes that are located beneath the bottom of the former UST that was removed/decommissioned due to the discovery of fuel releases to the subsurface soil and ground water. The modified aboveground piping manifold for the delivery of re-circulated groundwater will include flow control valves with pressure gauges, sampling ports and remote monitoring devices. The piping configuration will include ports on each water line to provide a means to manually inject a chemox solution in the flow discharged to the three injection wells.

Stantec proposes to use Klozur One® product as the chemox agent. The chemical oxidant will be manually injected on a quarterly basis into the recirculated groundwater - similar to the injection method used for the groundwater recirculation system at Tesoro 2Go Mart #111. The Klozur One® product, manufactured by Peroxy-Chem, consists of a powder substance that contains 95 percent (%) sodium persulfate and 5% proprietary chemical activator. When mixed with water, the oxidant solution has high solubility properties.

The REM well will be installed with Geoprobe™ 8040DT rig that uses a direct push drill method or a comparable drill rig. Subsequent to the construction of the REM well, a submersible pump will be installed in the completed well to capture groundwater and recirculate the water to the vertical injection wells (RW1, RW2 and RW3). A separate work plan for the pumping system including the manifold piping layout with flow control valves will be prepared by Stantec and submitted to ADEC for review prior to installation.

The following section describes the method that will be used for drilling, sampling, and installation of the 4-inch diameter polyvinyl chloride (PVC) cased REM well that will include 10 to 20 feet of well screen subject to the formation findings and ground water hydraulic characteristics:

- Soil samples will be recovered with a 2- to 3-inch diameter dual tube sampling technique, which produces continuous soil samples in 5-foot intervals. Continuous sample recovery will begin at the surface and continue to the depth of completion, or approximately 5 feet below the water level at the time of drilling. Samples will be visually/manually examined for lithology, color, density, moisture content, and indications of petroleum contamination.
- A photoionization detector (PID), calibrated with 100 parts per million by volume isobutylene gas standard, will be used to field screen the soil samples to determine the zones with the highest level of petroleum contamination. The field screening samples will be placed into plastic Ziploc® bags to enhance volatilization before headspace screening. Headspace screening will be conducted on 5-foot intervals.
- A minimum of two discrete analytical soil samples will be collected from the soil boring from the locations with the highest PID readings. The analytical soil samples collected

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from the recovered cores will be submitted for laboratory analysis of contaminants of concern including:

- GRO by Alaska Test Method (AK) 101
  - DRO by AK102
  - VOCs by U.S. Environmental Protection Agency Solid Waste Method (SW) 8260
  - PAHs by SW8270 Selective Ion Monitoring (SIM).
- Laboratory samples will be placed in clean, laboratory-supplied, amber glass jars, and samples for volatile organics will be preserved with methanol. The soil samples will be delivered in accordance with standard chain-of-custody procedures to TestAmerica Laboratories, Inc. of Anchorage, AK. Quality control samples consisting of duplicate and trip blank samples will be collected and analyzed.
  - Excess soils derived during the investigation will be stored onsite in drums and labeled with their contents. After analytical results are received from the laboratory, soil found to be contaminated above the appropriate ADEC SCLs will be disposed of at an appropriate treatment and/or disposal facility as approved by the ADEC.
  - A filter pack will be placed up to 2 feet above the well's slotted interval. The remaining annulus will be filled to the ground surface with an annular space seal consisting of hydrated bentonite.
  - The well will be developed by surging with use of a surge block, bailer, and/or submersible pump. Well development will be performed until water quality parameters stabilize or for 1 hour, whichever occurs first. Water quality parameters to be monitored include pH ( $\pm 0.1$ ), conductivity ( $\pm 3\%$ ), dissolved oxygen ( $\pm 10\%$ ), and oxidation-reduction potential ( $\pm 10$  millivolts). Should a low yielding well be encountered, the well will be developed in accordance with ADEC's *Monitoring Well Guidance* of September 2013, with the addition of potable water.
  - The well will be purged prior to sampling. Purging with a bailer or a well purge pump will take place after well development. All sampling activities will be completed in accordance with ADEC's *Underground Storage Tanks Procedures Manual– Standard Sampling Procedures* (March 22, 2017). Purging of the well will be considered complete when the following conditions occur:
    - A minimum of three casing volumes of water have been removed.
    - Water quality parameters stabilize for a minimum of three parameters (minimum of four if using temperature as an indicator): temperature (+ 3%), pH (+ 0.1), conductivity (+ 3%), redox potential (+ 10 millivolts [mv]), dissolved oxygen (+ 10%), and turbidity (+ 10%).

Reference: Task 3 Work Plan for Tesoro 2Go Mart #76

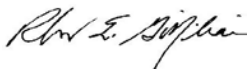
- A representative groundwater sample from the new completed well will be collected with a new bailer or a well purge pump. The analytical water samples collected from the well plus duplicate samples will be submitted for laboratory analysis for contaminants of concern that include GRO (AK101), DRO (AK102), VOC (SW8260) and PAHs (SW8270SIM).
- Laboratory samples will be placed in clean, laboratory-supplied, amber glass jars, and samples for volatile organics will be preserved with methanol. The water samples will be delivered in accordance with standard chain-of-custody procedures to TestAmerica Laboratories, Inc. of Anchorage, AK. Required quality control samples will be collected and analyzed and will include duplicate and trip blank samples.
- The well will be horizontally surveyed by swing-tie measurements to determine its location with respect to the surrounding monitoring wells and site improvements. The static water levels in the REM well and surrounding monitoring wells will be measured with respect to the top of each well casing to determine ground water flow direction and gradient. The elevation of the static water level will be based on a datum established during a vertical control survey completed by Stantec.

The above described field work is scheduled to be completed by the end of August 2019. Stantec will notify ADEC of the proposed drilling date at least 3 working days prior to the start of the field work. After completion of the field and laboratory work, Stantec will prepare a report on the findings of the subsurface investigation that will include a geologic log of the soil boring, well construction log, appropriate field notes, and the results of the field and laboratory analyses. The report will be prepared for Tesoro's review and, upon acceptance, will be submitted to ADEC.

If you have any questions or need additional information on this Work Plan, please feel free to contact me at (907) 227-9883.

Regards,

**Stantec Consulting Services Inc.**

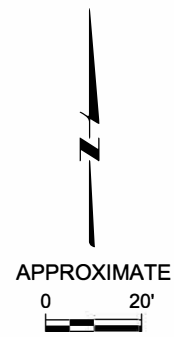


**Robert (Bob) Gilfilian** PE  
Senior Principal Civil Engineer  
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Attachment: Figure 1 – Site Plan for Proposed REM Well for Ground Water Remediation – Pump & Treat  
Figure 2 – Layout of Proposed REM Well Pump & Treat Remediation System

gb document4

E. PALMER WASILLA HWY



APPROXIMATE LOCATION OF PROPERTY LINE  
3600 PALMER-WASILLA HWY

WATER SUPPLY WELL LOCATION

UNDERGROUND STORAGE TANK  
CANOPY  
FUEL DISPENSER (TYP)

SEPTIC SYSTEM

MW-1

RW1

CAR WASH

TESORO  
2 GO MART #76

RW2

F-UST

UNDERGROUND PIPING

REMEDIAION WELL ACCESS POINT

RW3

F-UST

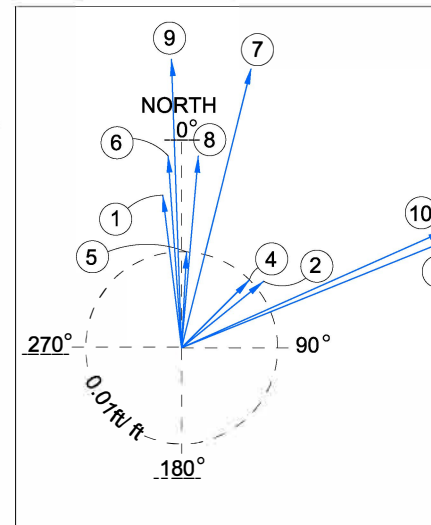
MW-2

MW-4

MW-3

**Proposed Location  
for REM Well**

CAMERON ACRES  
BLOCK 1  
LOT 7



GROUNDWATER FLOW SUMMARY

	DATE	BEARING	GRADIENT (ft/ft)
1	OCT. 13, 2016	353°	0.016
2	DEC. 9, 2016	51°	0.011
3	FEB. 8, 2017	68°	0.03
4	APRIL 24, 2017	45°	0.01
5	SEP. 1, 2017	3°	0.01
6	FEB. 15, 2018	356°	0.02
7	JUNE 29, 2018	14°	0.03
8	SEP. 11, 2018	5°	0.02
9	OCT. 26, 2018	358°	0.03
10	FEB. 25, 2019	66°	0.03

**MW-1**

Benzene	0.0037
Ethylbenzene	U(0.003)
Toluene	U(0.002)
Xylenes	U(0.003)
GRO	U(0.25)
DRO	0.19
GW Elev	76.59

**MW-2**

Benzene	<b>0.092</b>
Ethylbenzene	<b>0.18</b>
Toluene	0.22
Xylenes	<b>0.98</b>
GRO	<b>5.4</b>
DRO	1.2
GW Elev	75.96

**MW-3**

Benzene	<b>0.95</b>
Ethylbenzene	<b>2.3</b>
Toluene	0.69
Xylenes	<b>8.2</b>
GRO	U(1.3)
DRO	<b>4.6</b>
GW Elev	78.15

**MW-3** (Duplicate)

Benzene	<b>0.92</b>
Ethylbenzene	<b>2.3</b>
Toluene	0.69
Xylenes	<b>8.4</b>
GRO	U(1.3)
DRO	<b>4.6</b>

**MW-4**

Benzene	<b>0.026</b>
Ethylbenzene	0.0034
Toluene	U(0.002)
Xylenes	0.0089
GRO	U(0.25)
DRO	0.20
GW Elev	78.3

LEGEND:

- F-UST FORMER UNDERGROUND STORAGE TANK
- MONITORING WELL LOCATION
- REMEDIAION WELL LOCATION
- DRO DIESEL RANGE ORGANICS
- GRO GASOLINE RANGE ORGANICS
- H SAMPLE WAS PREPPED OR ANALYZED BEYOND THE SPECIFIED HOLDING TIME
- RW REMEDIAION WELL
- U UNDETECTED ABOVE PRACTICAL QUANTITATION LIMITS SHOWN IN PARENTHESES
- DRINKING WATER WELL

NOTES:

- RESULTS SHOWN ARE FOR WELLS SAMPLED ON FEBRUARY 25, 2019
- RESULTS ARE IN MILLIGRAMS PER LITER
- BOLD/ RED TEXT INDICATES CONTAMINANT CONCENTRATIONS ABOVE CLEANUP LEVELS FOR THIS SITE



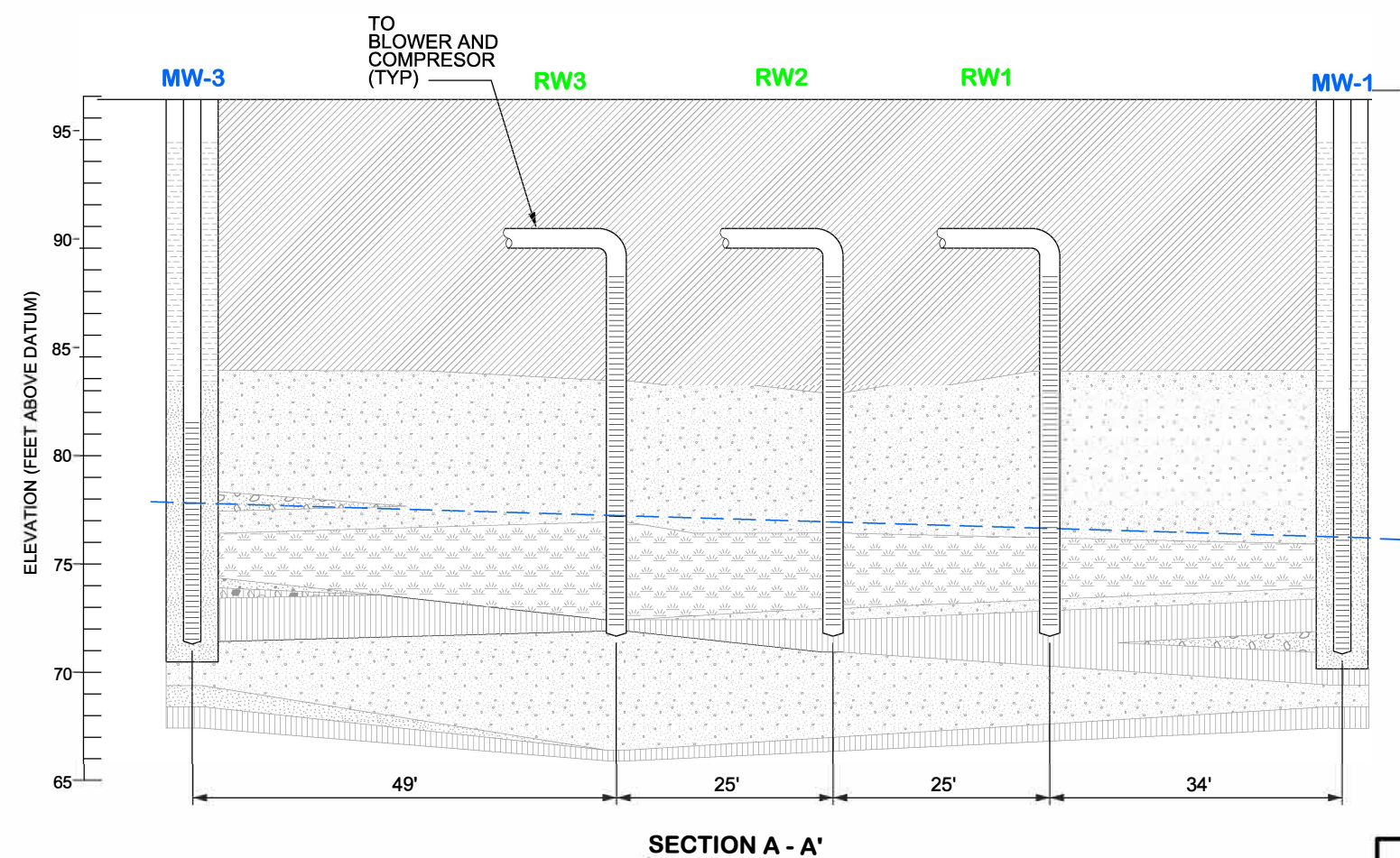
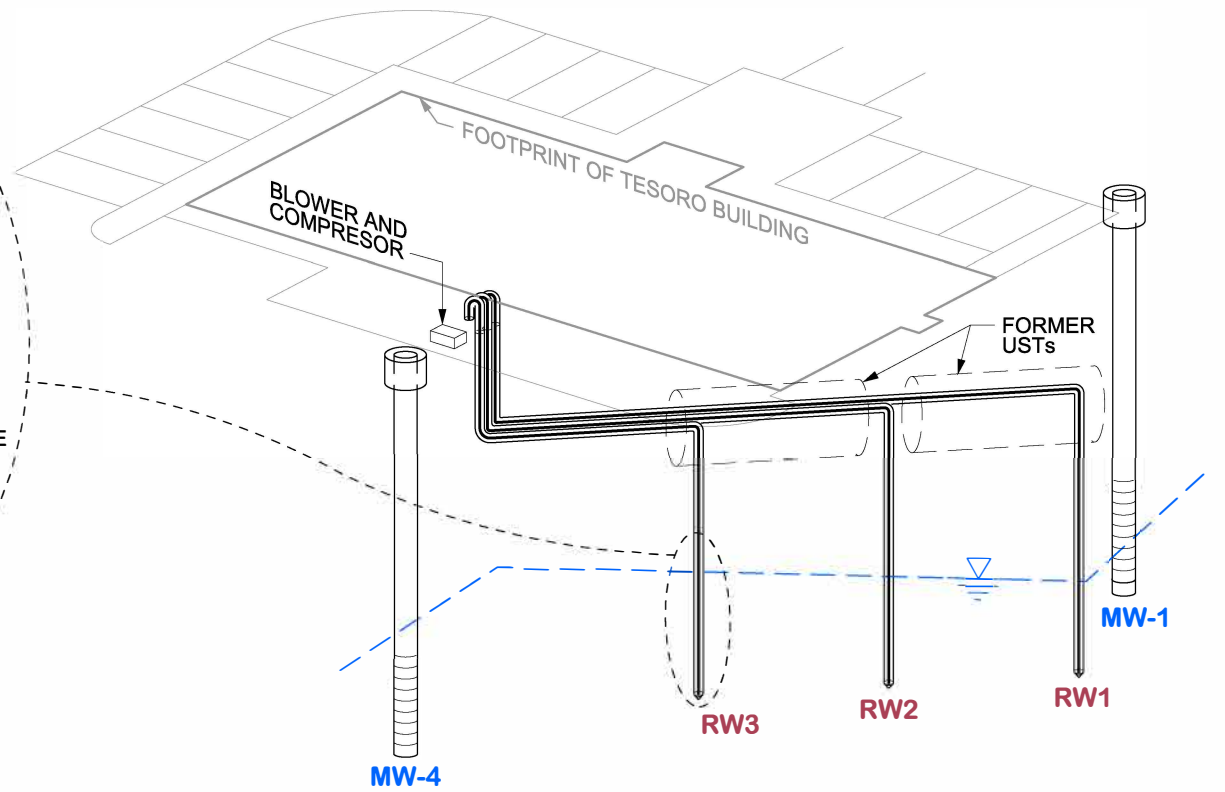
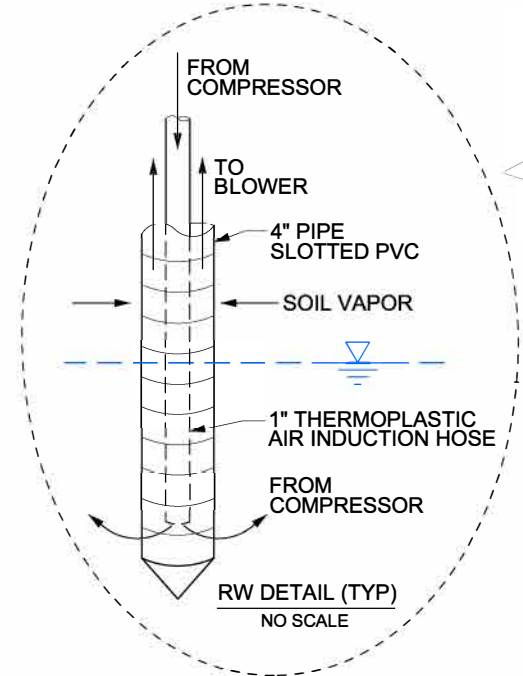
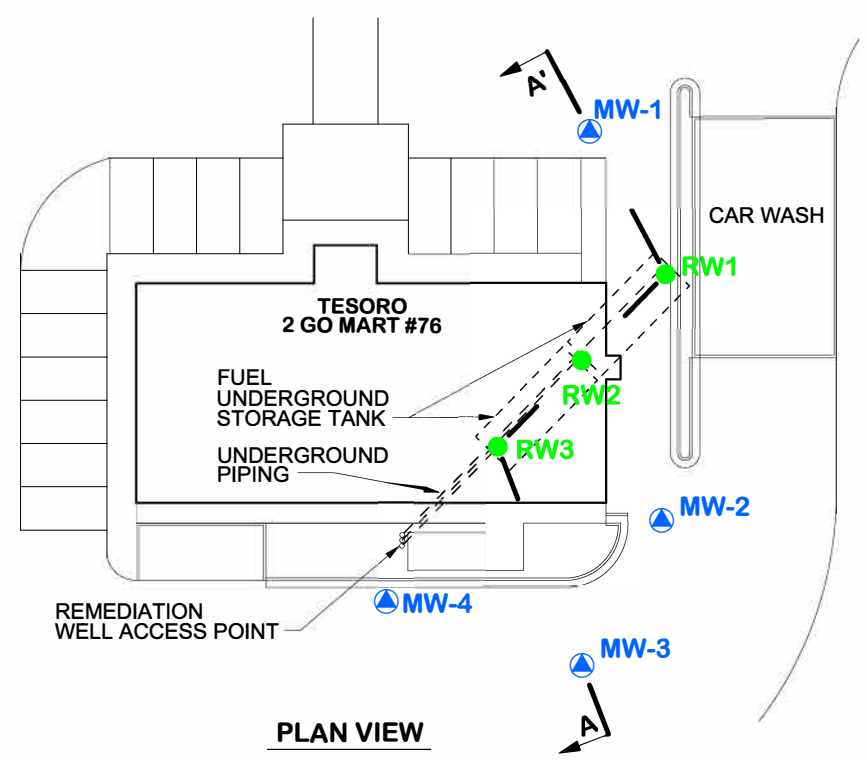
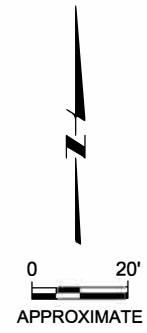
TESORO 2 GO MART #76

SITE PLAN  
Proposed REM Well for Ground Water  
Remediation - Pump & Treat

FIGURE

1

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**LITHOLOGY KEY:**

	GW		SM
	GM		ML
	SW		PT
	SP		FILL
	ANNULAR SEAL		

**LEGEND:**

	GROUNDWATER LEVEL
	MW MONITORING WELL
	RW REMEDIATION WELL
	UST UNDERGROUND STORAGE WELL

**NOTE:**  
**references to "BLOWER"**  
**are to be changed to "REM WELL"**

TIME: 28-FEB-2017 09:53  
 FILE: C:\D\CAD\Proj\Temo01\GMap076\2017\2017 Biosparge Pilot Study WPI\PIA\Fig02 Remediation System Layout.dgn