
To: Daniel (Danny) Monson, MPC Advanced HES Professional, ES&S-Waste and Remediation
Marathon Petroleum Company (MPC)
301 E. Ocean Blvd, Suite 1600, Long Beach, CA 90802

From: Bob Gilfilian, PE, Senior Principal Engineer
Stantec Consulting Services, Inc.
725 E Fireweed Lane, Suite 200
Anchorage, Alaska 99508

File: Speedway Store 5313 (Former Tesoro 2Go Mart 101) & IFC
UST Facility #2960, ADEC File 100.26.022

Date: November 10, 2021

Reference: Speedway Store 5313 (Former Tesoro 2Go Mart 101) & IFC - Report on the Installation of the New 2021 Drainfield for Discharge of Effluent from Groundwater Treatment Aeration Tank

1 INTRODUCTION

On behalf of Marathon Petroleum Company (MPC), Stantec Consulting Inc. (Stantec) is pleased to submit this Technical Memorandum (TM) for the installation of the new 2021 Drainfield completed at Speedway Store #5313 (Former Tesoro 2Go Mart 101) & IFC, located at 3569 South Cushman Road, Fairbanks, Alaska.

1.1 PURPOSE & SCOPE

This TM describes the methods used for the installation of a new drainfield (referred to as 2021 Drainfield). This TM includes construction photos and a record drawing of the completed drainfield. The installation of the 2021 Drainfield was completed in accordance with the Task 3 (Install additional drainfield to handle increased well drawdown flow from the free product recovery wells CRW-2 and WRW 2020). Task 3 was proposed in the 2021 Corrective Action Plan (CAP) for the subject site that was subsequently approved by the Pete Campbell, P.E., with the Alaska Department of Environmental Conservation (ADEC).

1.2 PROJECT ORGANIZATION

Owner/Operator – Marathon Petroleum Company (MPC), represented by Danny Monson. Advanced HES Professional.

Environmental Consultant – Stantec Consulting Services, Inc., represented by Bob Gilfilian, P.E., Stantec, Principal, Senior Civil Engineer. Assisted in the field by the following engineering staff from the Stantec Fairbank office: Leslie Petre, EIT, and Geoff Moorhead, EIT.

Contractor/Installer – Greenstone Station, Inc. (Shaun Patterson, operator/owner), a construction subcontractor to Discovery Drilling, Inc.

ADEC Certified Laboratory – SGS North American Inc, 200 West Potter Drive, Anchorage, Alaska

1.3 PROJECT BACKGROUND

The 2021 Drainfield was designed to be located parallel and adjacent to the existing 100-foot long drainfield that was installed by Stantec (formerly MWH) in 2006. The 2021 Drainfield receives treated effluent from the existing 1,500 gallon, 2 compartment, groundwater aeration treatment tank. The aeration treatment tank treats groundwater discharged from submersible well pumps located in the two existing free product recovery wells

Reference: Speedway Store 5313 (Former Tesoro 2Go Mart 101) & IFC - Report on the Installation of the New 2021 Drainfield for Discharge of Effluent from Groundwater Treatment Aeration Tank

(CRW-2 and WRW 2020). The submersible pumps are used in the recovery wells to depress the groundwater table to facilitate the capture of free product. Aerated (treated) effluent from the aeration tank flows in a header pipe that splits the discharge between the existing 2006 drainfield and the 2021 drainfield.

The 2021 drainfield was approved to be constructed with an Infiltrator™ drainage system similar to the design used for the construction of the existing 2006 drainfield. The new 2021 drainfield will allow the drawdown pumps in CRW-2 and WRW 2020 Wells to pump much higher flows (anticipate total flow of 5 to 10 gallons per minute) that should increase the wells' radius of influence resulting in more effective capture of free product.

2 INSTALLATION OF 2021 DRAINFIELD

The 2021 Drainfield was installed on September 28 to 30, 2021. Stantec field staff were on-site continuously during the installation. A track mounted Kubota KX080-4 Excavator was used to excavate the trench for construction of the drainfield. In addition, a rubber track Cat 200 Series "skid steer" was used to move/load screened rock for placement in the drainfield and provide site grading as needed.

Figure 1 shows the approximate layout of the 2021 Drainfield with respect to existing site improvements. The exact locations of all site improvements will be re-surveyed in 2022. Stantec provided elevation control for the placement of the gravity discharge line from the aeration treatment tank to the Infiltrator™ system (described below). Photographs of the entire installation for documentation purposes were taken by Stantec. Selected representative photos with descriptions (captions) of key site work are provided in a photo log in Attachment A.

2.1 DESCRIPTION OF TRENCH EXCAVATION

Stantec directed the contractor during the excavation of the trench for the 2021 Drainfield and installation of the drainpipes from the aeration tank and placement of the Infiltrator™ chambers. The excavated soil was routinely sampled and screened in the field with a calibrated photoionization detector (PID). The excavated soil was segregated into separate stockpiles described below, dependent on the PID field measurements. The apparent "clean" soil had a typical PID measurement of 5 to 10 ppmv; whereas the obvious (determined visually and odor) contaminated soil had PID readings in the 100s up to 1,700 ppmv.

Based on PID field screening measurement and olfactory observations, the "clean" soil consisted primarily of a brown silt material that extended from the ground surface to a depth of approximately 9.5-feet. A thin (0.5-foot thick) organic mat was encountered at a depth of approximately 7 to 8-feet below the ground surface (bgs). At 9.5-feet bgs across the entire bottom of the trench excavation, a distinct dark stained, well drained, gravel sandy strata was encountered that was obviously contaminated. The layer of well drained contaminated gravelly sand soil and groundwater table was similar to that encountered during the installation of the 2006 drainfield.

The drainfield trench was excavated to the following dimensions: 10-feet wide, 45-feet long, and approximately 12 feet deep bgs. Petroleum contaminated soil was encountered in the entire excavation at a depth of approximately 9.5-feet bgs and extended to the bottom of the excavation. Groundwater was encountered at a depth of approximately 10 to 11-feet bgs and was observed to have a heavy petroleum sheen.

A stockpile of contaminated soil was constructed onsite for temporary storage of the soil until next year for subsequent removal and treatment. The stockpile was placed on 10-mil visqueen and securely covered with 10-mil visqueen. The stockpile contains approximately 40-cubic yards of soil and was placed along the northern edge of the site, nearly parallel to the 2021 Drainfield.

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2.2 PLACEMENT OF KLOZUR CR™ FOR IN-SITU SOIL AND GROUNDWATER REMEDIATION

Upon completion of the excavation of the drainfield trench, Stantec directed the placement of the Klozur CR™ product into the bottom of the trench that contained petroleum contaminated groundwater and soil. The Klozur CR™ consists of a powder that is a self-activating persulfation product (a persulfate oxidation system) with calcium peroxide. The powder was uniformly spread/broadcast with the excavator bucket across the entire bottom of the trench. The application rate of the Klozur CR™ was approximately 5.2 pounds per square foot which is within the manufacturer recommended application rate for in-situ treatment. In summary, a total of 2,340 pounds of Klozur CR™ was used for the in-situ treatment of the exposed contaminated groundwater and soil at the bottom of the trench. A photo of the application of the Klozur CR™ powder is provided in the photo log (Attachment A).

2.3 INSTALLATION OF INFILTRATOR™ SYSTEM

Following the spreading of the Klozur product on the bottom of the trench, the excavation was filled with approximately 3 to 4 feet of screened sewer rock up to the base of the Infiltrators™. The bottom drainage area of the drainfield was determined to be approximately 450 square feet. The sewer rock is similar to what has been used in the existing 2006 drainfield. The sewer rock was also used to cover the Infiltrators™. Approximately 96 cubic yards of sewer rock was placed in the drainfield trench excavation.

The Infiltrators™ were placed nearly level in 3 parallel rows in a bed layout over the screened rock base that covered an area of approximately 10-feet by 45-feet. The bed of the Infiltrators™ was slightly sloped to the far end (west end) of the drainfield to facilitate gravity flow across the bed. A total of 27 Infiltrators™ chambers (9 chambers for each row) were installed for the drainfield. 4-inch diameter PVC observation/monitor pipes were installed vertically at the end of each row to allow future measurement of water levels in the drainfield Infiltrator™.

A geofabric material was placed over the top of the Infiltrators™ to prevent soil backfill from infiltrating into the Infiltrators™ and sewer rock. The fabric material was placed at approximately 5.5-feet below the ground surface. Non-contaminated native soil that was originally excavated from the trench excavation was used to backfill over the Infiltrators™. The backfill brought the final grade of the drainfield to match the existing ground surface with some mounding for potential future settlement and positive drainage of surface water.

2.4 ANALYTICAL SAMPLING METHODOLOGY AND RESULTS

As described above, petroleum contaminated soil was encountered at a depth of approximately 9.5-feet bgs. The contaminated soil was placed in the 10-mil thick visqueen lined stockpile. A representative soil sample was collected from the 40-cubic yard stockpile of contaminated soil. The soil sample was field screened with a calibrated PID and had a recorded measurement of 1,705 ppmv. The soil sample was sent via chain of custody to SGS North American Inc (SGS) located in Anchorage, Alaska, for analysis of the gasoline range organics (GRO) by Alaska Test Method (AK) 101, and diesel range organics (DRO) by AK102. The laboratory analytical report provided in Attachment B confirms the soil has GRO and DRO contaminants that exceeds the ADEC Soil Cleanup Levels (SCLs).

The laboratory test results will be used for stockpile characterization purposes for the delivery of the contaminated soil to an ADEC approved off-site thermal treatment and disposal facility located near Fairbanks. After winter breakup in 2022, Stantec will submit a request on behalf of MPC to ADEC for approval to transport the soil to the treatment facility.

November 10, 2021

Daniel (Danny) Monson, MPC Advanced HES Professional, ES&S-Waste and Remediation

Page 4 of 4

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3 CONCLUSIONS AND RECOMMENDATIONS

On September 30, 2021, the discharge lines from free product recovery wells CRW-2 and WRW 2020 were reconnected to aeration treatment tank, and the aeration blower was restarted to inject air into the aeration tank. A few days later during the first week of October, the drawdown pumps in free product recovery wells CRW-2 and WRW 2020 were activated and started flow of nearly 4 gpm into the aeration tank. Aerated treated effluent from the aeration tank drains via gravity into the 2006 and 2021 Drainfields.

The purpose of this report was to provide a summary of the field observations and laboratory data collected during the installation of the 2021 Drainfield. The approximate layout of the 2021 Drainfield is provided on the site map, Figure 1. The photo log in Attachment A provides additional documentation on the site conditions encountered during the drainfield installation.

4 LIMITATIONS

Stantec conducted the work reported herein in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty, expressed or implied, is made. Data and recommendation made herein were prepared for Marathon Petroleum Company. Information herein is for use at this site in accordance with the purpose of the report as described.

Please feel free to contact me if you have any questions regarding the findings and information reported herein.

STANTEC CONSULTING SERVICES INC.



Prepared by: Robert (Bob) Gilfilian, PE

Principal, Civil Engineer
725 E Fireweed Lane, Suite 200
Anchorage, AK 99508
Cell Phone: (907) 277-9883
bob.gilfilian@stantec.com

Attachments: Figure 1 - Site Plan for the Installation of the 2021 Drainfield
Attachment A – Photo Log (Soil Boring Logs for MW 19-1 and MW 19-2)
Attachment B – SGS Laboratory Analytical Report

c. Pete Campbell, ADEC Contaminated Sites Program

ATTACHMENT A

PHOTO LOG WITH CAPTIONS OF SITE CONDITIONS



Photo #1 – Panoramic View of Site Prior to Start of 2021 Drainfield Installation (looking west)



Photo #2 – Start of East End of Trench Excavation (looking east). Note sheen on groundwater and stained contaminated soil strata at bottom of trench.



Photo #3 – Excavation of West End of Trench. Note stained soil strata near bottom of excavation.



Photo #4 – Excavation of Trench (looking west) towards Shed for WRW well. Note dark stained soil strata at bottom of trench. Note the stockpile of contaminated soil in the background.



Photo #5 – Application of Klozur™ CR powder on the bottom of trench in contaminated groundwater.



Photo #6 – Start of Installation of Infiltrators™ with Sewer Rock.



Photo #7 - Completed Installation of Infiltrators prior to placement of Fabric Material



Photo #8 - Covered 40 CY Stockpile of Contaminated Soil (looking north)

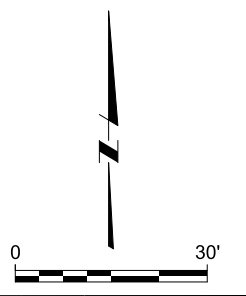


Photo #9 – Installation of Fabric Material of Completed Infiltrator Drainfield (looking east).



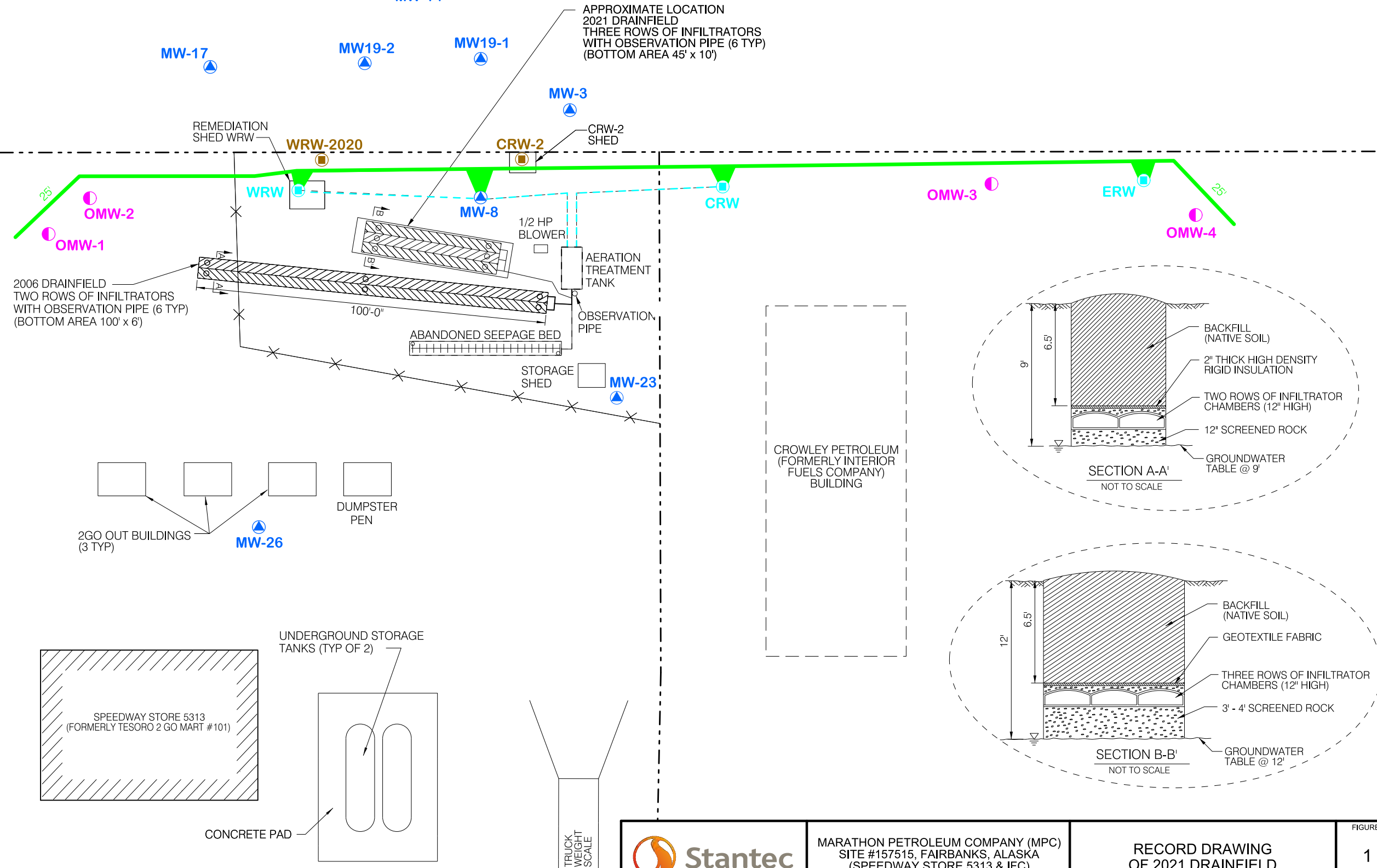
Photo #10 – Completed Installation of Backfill over 2021 Drainfield with Observation Pipes

FILE: C:\D\CAD\Proj\Speedway_Tesoro\Speedway_5313 (TGMart10)IFC_185705376\2021\2021 Record Drainfield\Fig01_Record Drainfield 2021.dgn
 TIME: 04-NOV-2021 21:05



KEY:

- LEGEND:**
- PROPERTY LINE
 - - - 3 EA. 4" DIA. ENVIROFLEX SECONDARY PIPING
 - INTERCEPTOR TRENCH
 - ✕ FENCE
 - OBSERVATION WELL
 - 6" RECOVERY WELL
 - 10" RECOVERY WELL
 - ▲ MONITORING WELL
 - ▲ PRIVATE INDUSTRIAL WELL
 - CRW CENTRAL RECOVERY WELL
 - ERW EAST RECOVERY WELL
 - OMW OBSERVATION WELL
 - OWE OBSERVATION WELL EAST
 - WRW WEST RECOVERY WELL



	MARATHON PETROLEUM COMPANY (MPC) SITE #157515, FAIRBANKS, ALASKA (SPEEDWAY STORE 5313 & IFC) NEW 2021 DRAINFIELD	RECORD DRAWING OF 2021 DRAINFIELD	FIGURE 1 185751324
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ATTACHMENT B

SGS LABORATORY ANALYTICAL REPORT



Laboratory Report of Analysis

To: Stantec Consulting Services Inc.
725 E Fireweed Lane #200
Anchorage, AK 99503
(907)251-6153

Report Number: **1216469**

Client Project: **185705376 Speedway 1513**

Dear Leslie Petre,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Justin Nelson
Project Manager
Justin.Nelson@sgs.com

Date

Case Narrative

SGS Client: **Stantec Consulting Services Inc.**
SGS Project: **1216469**
Project Name/Site: **185705376 Speedway 1513**
Project Contact: **Leslie Petre**

Refer to sample receipt form for information on sample condition.

2021 Leach (1216469001) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.
8260D - VOC surrogate recovery for 4-Bromofluorobenzene does not meet QC criteria due to matrix interference.

Duplicate (1216469002) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.
8260D - VOC surrogate recovery for 4-Bromofluorobenzene does not meet QC criteria due to matrix interference.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 10/14/2021 4:59:22PM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
2021 Leach	1216469001	09/28/2021	09/30/2021	Soil/Solid (dry weight)
Duplicate	1216469002	09/28/2021	09/30/2021	Soil/Solid (dry weight)
TB	1216469003	09/28/2021	09/30/2021	Soil/Solid (dry weight)

<u>Method</u>	<u>Method Description</u>
AK102	Diesel Range Organics (S)
AK101	Gasoline Range Organics (S)
SM21 2540G	Percent Solids SM2540G
SW8260D	Volatile Organic Compounds (S) FIELD EXT

Print Date: 10/14/2021 4:59:26PM

Detectable Results Summary

Client Sample ID: **2021 Leach**

Lab Sample ID: 1216469001

Semivolatile Organic Fuels

Volatile Fuels

Volatile GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	4320	mg/kg
Gasoline Range Organics	341	mg/kg
Benzene	22.2J	ug/kg
Ethylbenzene	5280	ug/kg
o-Xylene	12000	ug/kg
P & M -Xylene	27900	ug/kg
Toluene	362	ug/kg
Xylenes (total)	39900	ug/kg

Client Sample ID: **Duplicate**

Lab Sample ID: 1216469002

Semivolatile Organic Fuels

Volatile Fuels

Volatile GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	5000	mg/kg
Gasoline Range Organics	380	mg/kg
Ethylbenzene	4930	ug/kg
o-Xylene	10400	ug/kg
P & M -Xylene	26300	ug/kg
Toluene	234	ug/kg
Xylenes (total)	36700	ug/kg

Client Sample ID: **TB**

Lab Sample ID: 1216469003

Volatile Fuels

Volatile GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	1.34J	mg/kg
Ethylbenzene	11.1J	ug/kg
o-Xylene	14.7J	ug/kg
P & M -Xylene	47.3J	ug/kg
Xylenes (total)	61.9J	ug/kg



Results of 2021 Leach

Client Sample ID: **2021 Leach**
Client Project ID: **185705376 Speedway 1513**
Lab Sample ID: 1216469001
Lab Project ID: 1216469

Collection Date: 09/28/21 16:20
Received Date: 09/30/21 08:39
Matrix: Soil/Solid (dry weight)
Solids (%):88.2
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	4320		89.7	40.4	mg/kg	4		10/12/21 21:40
Surrogates								
5a Androstane (surr)	76.1		50-150		%	4		10/12/21 21:40

Batch Information

Analytical Batch: XFC16109
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 10/12/21 21:40
Container ID: 1216469001-A

Prep Batch: XXX45673
Prep Method: SW3550C
Prep Date/Time: 10/05/21 07:54
Prep Initial Wt./Vol.: 30.316 g
Prep Extract Vol: 5 mL



Results of 2021 Leach

Client Sample ID: **2021 Leach**
Client Project ID: **185705376 Speedway 1513**
Lab Sample ID: 1216469001
Lab Project ID: 1216469

Collection Date: 09/28/21 16:20
Received Date: 09/30/21 08:39
Matrix: Soil/Solid (dry weight)
Solids (%):88.2
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	341		10.1	3.03	mg/kg	5		10/01/21 15:24
Surrogates								
4-Bromofluorobenzene (surr)	6420	*	50-150		%	5		10/01/21 15:24

Batch Information

Analytical Batch: VFC15861
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 10/01/21 15:24
Container ID: 1216469001-B

Prep Batch: VXX37948
Prep Method: SW5035A
Prep Date/Time: 09/28/21 16:20
Prep Initial Wt./Vol.: 104.834 g
Prep Extract Vol: 37.3392 mL



Results of 2021 Leach

Client Sample ID: **2021 Leach**
Client Project ID: **185705376 Speedway 1513**
Lab Sample ID: 1216469001
Lab Project ID: 1216469

Collection Date: 09/28/21 16:20
Received Date: 09/30/21 08:39
Matrix: Soil/Solid (dry weight)
Solids (%):88.2
Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	22.2 J	50.5	15.7	ug/kg	5		10/01/21 16:17
Ethylbenzene	5280	101	31.5	ug/kg	5		10/01/21 16:17
o-Xylene	12000	1010	315	ug/kg	50		10/01/21 20:26
P & M -Xylene	27900	2020	606	ug/kg	50		10/01/21 20:26
Toluene	362	101	31.5	ug/kg	5		10/01/21 16:17
Xylenes (total)	39900	3030	920	ug/kg	50		10/01/21 20:26

Surrogates

1,2-Dichloroethane-D4 (surr)	103	71-136		%	5		10/01/21 16:17
4-Bromofluorobenzene (surr)	175 *	55-151		%	5		10/01/21 16:17
Toluene-d8 (surr)	97.6	85-116		%	5		10/01/21 16:17

Batch Information

Analytical Batch: VMS21238
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 10/01/21 16:17
Container ID: 1216469001-B

Prep Batch: VXX37956
Prep Method: SW5035A
Prep Date/Time: 09/28/21 16:20
Prep Initial Wt./Vol.: 104.834 g
Prep Extract Vol: 37.3392 mL

Analytical Batch: VMS21238
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 10/01/21 20:26
Container ID: 1216469001-B

Prep Batch: VXX37956
Prep Method: SW5035A
Prep Date/Time: 09/28/21 16:20
Prep Initial Wt./Vol.: 104.834 g
Prep Extract Vol: 37.3392 mL



Results of Duplicate

Client Sample ID: **Duplicate**
Client Project ID: **185705376 Speedway 1513**
Lab Sample ID: 1216469002
Lab Project ID: 1216469

Collection Date: 09/28/21 16:20
Received Date: 09/30/21 08:39
Matrix: Soil/Solid (dry weight)
Solids (%):85.4
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	5000		92.2	41.5	mg/kg	4		10/12/21 21:50
Surrogates								
5a Androstane (surr)	86.2		50-150		%	4		10/12/21 21:50

Batch Information

Analytical Batch: XFC16109
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 10/12/21 21:50
Container ID: 1216469002-A

Prep Batch: XXX45673
Prep Method: SW3550C
Prep Date/Time: 10/05/21 07:54
Prep Initial Wt./Vol.: 30.466 g
Prep Extract Vol: 5 mL



Results of Duplicate

Client Sample ID: **Duplicate**
Client Project ID: **185705376 Speedway 1513**
Lab Sample ID: 1216469002
Lab Project ID: 1216469

Collection Date: 09/28/21 16:20
Received Date: 09/30/21 08:39
Matrix: Soil/Solid (dry weight)
Solids (%):85.4
Location:

Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	380		10.1	3.04	mg/kg	5		10/01/21 15:43
Surrogates								
4-Bromofluorobenzene (surr)	8710	*	50-150		%	5		10/01/21 15:43

Batch Information

Analytical Batch: VFC15861
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 10/01/21 15:43
Container ID: 1216469002-B

Prep Batch: VXX37948
Prep Method: SW5035A
Prep Date/Time: 09/28/21 16:20
Prep Initial Wt./Vol.: 124.861 g
Prep Extract Vol: 43.2284 mL



Results of Duplicate

Client Sample ID: **Duplicate**
Client Project ID: **185705376 Speedway 1513**
Lab Sample ID: 1216469002
Lab Project ID: 1216469

Collection Date: 09/28/21 16:20
Received Date: 09/30/21 08:39
Matrix: Soil/Solid (dry weight)
Solids (%):85.4
Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	25.4 U	50.7	15.8	ug/kg	5		10/01/21 16:33
Ethylbenzene	4930	101	31.6	ug/kg	5		10/01/21 16:33
o-Xylene	10400	1010	316	ug/kg	50		10/01/21 20:42
P & M -Xylene	26300	2030	608	ug/kg	50		10/01/21 20:42
Toluene	234	101	31.6	ug/kg	5		10/01/21 16:33
Xylenes (total)	36700	3040	924	ug/kg	50		10/01/21 20:42

Surrogates

1,2-Dichloroethane-D4 (surr)	100	71-136		%	5		10/01/21 16:33
4-Bromofluorobenzene (surr)	232 *	55-151		%	5		10/01/21 16:33
Toluene-d8 (surr)	93.2	85-116		%	5		10/01/21 16:33

Batch Information

Analytical Batch: VMS21238
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 10/01/21 16:33
Container ID: 1216469002-B

Prep Batch: VXX37956
Prep Method: SW5035A
Prep Date/Time: 09/28/21 16:20
Prep Initial Wt./Vol.: 124.861 g
Prep Extract Vol: 43.2284 mL

Analytical Batch: VMS21238
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 10/01/21 20:42
Container ID: 1216469002-B

Prep Batch: VXX37956
Prep Method: SW5035A
Prep Date/Time: 09/28/21 16:20
Prep Initial Wt./Vol.: 124.861 g
Prep Extract Vol: 43.2284 mL



Results of TB

Client Sample ID: **TB**
Client Project ID: **185705376 Speedway 1513**
Lab Sample ID: 1216469003
Lab Project ID: 1216469

Collection Date: 09/28/21 16:20
Received Date: 09/30/21 08:39
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.34 J	2.53	0.758	mg/kg	1		10/01/21 17:13
Surrogates							
4-Bromofluorobenzene (surr)	122	50-150		%	1		10/01/21 17:13

Batch Information

Analytical Batch: VFC15861
Analytical Method: AK101
Analyst: IJV
Analytical Date/Time: 10/01/21 17:13
Container ID: 1216469003-A

Prep Batch: VXX37948
Prep Method: SW5035A
Prep Date/Time: 09/28/21 16:20
Prep Initial Wt./Vol.: 49.447 g
Prep Extract Vol: 25 mL



Results of TB

Client Sample ID: **TB**
 Client Project ID: **185705376 Speedway 1513**
 Lab Sample ID: 1216469003
 Lab Project ID: 1216469

Collection Date: 09/28/21 16:20
 Received Date: 09/30/21 08:39
 Matrix: Soil/Solid (dry weight)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	6.30 U	12.6	3.94	ug/kg	1		10/01/21 15:46
Ethylbenzene	11.1 J	25.3	7.89	ug/kg	1		10/01/21 15:46
o-Xylene	14.7 J	25.3	7.89	ug/kg	1		10/01/21 15:46
P & M -Xylene	47.3 J	50.6	15.2	ug/kg	1		10/01/21 15:46
Toluene	12.7 U	25.3	7.89	ug/kg	1		10/01/21 15:46
Xylenes (total)	61.9 J	75.8	23.1	ug/kg	1		10/01/21 15:46
Surrogates							
1,2-Dichloroethane-D4 (surr)	97.8	71-136		%	1		10/01/21 15:46
4-Bromofluorobenzene (surr)	116	55-151		%	1		10/01/21 15:46
Toluene-d8 (surr)	102	85-116		%	1		10/01/21 15:46

Batch Information

Analytical Batch: VMS21238
 Analytical Method: SW8260D
 Analyst: S.S
 Analytical Date/Time: 10/01/21 15:46
 Container ID: 1216469003-A

Prep Batch: VXX37956
 Prep Method: SW5035A
 Prep Date/Time: 09/28/21 16:20
 Prep Initial Wt./Vol.: 49.447 g
 Prep Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1826596 [SPT/11403]

Blank Lab ID: 1640266

QC for Samples:

1216469001, 1216469002

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Solids	100			%

Batch Information

Analytical Batch: SPT11403

Analytical Method: SM21 2540G

Instrument:

Analyst: TMM

Analytical Date/Time: 10/5/2021 5:40:00PM

Print Date: 10/14/2021 4:59:31PM



Duplicate Sample Summary

Original Sample ID: 1216511001

Duplicate Sample ID: 1640267

QC for Samples:

1216469001, 1216469002

Analysis Date: 10/05/2021 17:40

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	94.9	95.2	%	0.40	(< 15)

Batch Information

Analytical Batch: SPT11403

Analytical Method: SM21 2540G

Instrument:

Analyst: TMM

Print Date: 10/14/2021 4:59:32PM



Method Blank

Blank ID: MB for HBN 1826487 [VXX/37948]

Blank Lab ID: 1639754

QC for Samples:

1216469001, 1216469002, 1216469003

Matrix: Soil/Solid (dry weight)

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	1.25U	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	90	50-150		%

Batch Information

Analytical Batch: VFC15861

Analytical Method: AK101

Instrument: Agilent 7890 PID/FID

Analyst: IJV

Analytical Date/Time: 10/1/2021 2:01:00PM

Prep Batch: VXX37948

Prep Method: SW5035A

Prep Date/Time: 10/1/2021 6:00:00AM

Prep Initial Wt./Vol.: 50 g

Prep Extract Vol: 25 mL

Print Date: 10/14/2021 4:59:35PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1216469 [VXX37948]
 Blank Spike Lab ID: 1639755
 Date Analyzed: 10/01/2021 13:25

Spike Duplicate ID: LCSD for HBN 1216469 [VXX37948]
 Spike Duplicate Lab ID: 1639756
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1216469001, 1216469002, 1216469003

Results by AK101

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	12.5	13.0	104	12.5	13.1	105	(60-120)	1.10	(< 20)

Surrogates

4-Bromofluorobenzene (surr)	1.25		89	1.25		97	(50-150)	8.80	
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Batch Information

Analytical Batch: **VFC15861**
 Analytical Method: **AK101**
 Instrument: **Agilent 7890 PID/FID**
 Analyst: **IJV**

Prep Batch: **VXX37948**
 Prep Method: **SW5035A**
 Prep Date/Time: **10/01/2021 06:00**
 Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Print Date: 10/14/2021 4:59:37PM

Method Blank

Blank ID: MB for HBN 1826523 [VXX/37956]
 Blank Lab ID: 1639870

Matrix: Soil/Solid (dry weight)

QC for Samples:
 1216469001, 1216469002, 1216469003

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	6.25U	12.5	3.90	ug/kg
Ethylbenzene	12.5U	25.0	7.80	ug/kg
o-Xylene	12.5U	25.0	7.80	ug/kg
P & M -Xylene	25.0U	50.0	15.0	ug/kg
Toluene	12.5U	25.0	7.80	ug/kg
Xylenes (total)	37.5U	75.0	22.8	ug/kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	104	71-136		%
4-Bromofluorobenzene (surr)	92.6	55-151		%
Toluene-d8 (surr)	101	85-116		%

Batch Information

Analytical Batch: VMS21238
 Analytical Method: SW8260D
 Instrument: VRA Agilent GC/MS 7890B/5977A
 Analyst: S.S
 Analytical Date/Time: 10/1/2021 11:47:00AM

Prep Batch: VXX37956
 Prep Method: SW5035A
 Prep Date/Time: 10/1/2021 6:00:00AM
 Prep Initial Wt./Vol.: 50 g
 Prep Extract Vol: 25 mL



Blank Spike Summary

Blank Spike ID: LCS for HBN 1216469 [VXX37956]
Blank Spike Lab ID: 1639871
Date Analyzed: 10/01/2021 13:17

Matrix: Soil/Solid (dry weight)

QC for Samples: 1216469001, 1216469002, 1216469003

Results by SW8260D

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
Benzene	750	780	104	(77-121)
Ethylbenzene	750	786	105	(76-122)
o-Xylene	750	795	106	(77-123)
P & M -Xylene	1500	1580	106	(77-124)
Toluene	750	766	102	(77-121)
Xylenes (total)	2250	2380	106	(78-124)

Surrogates

1,2-Dichloroethane-D4 (surr)	750	99	(71-136)
4-Bromofluorobenzene (surr)	750	90	(55-151)
Toluene-d8 (surr)	750	101	(85-116)

Batch Information

Analytical Batch: VMS21238
Analytical Method: SW8260D
Instrument: VRA Agilent GC/MS 7890B/5977A
Analyst: S.S

Prep Batch: VXX37956
Prep Method: SW5035A
Prep Date/Time: 10/01/2021 06:00
Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 10/14/2021 4:59:42PM

Matrix Spike Summary

Original Sample ID: 1639872
 MS Sample ID: 1639873 MS
 MSD Sample ID: 1639874 MSD

Analysis Date: 10/01/2021 16:02
 Analysis Date: 10/01/2021 14:12
 Analysis Date: 10/01/2021 14:28
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1216469001, 1216469002, 1216469003

Results by SW8260D

Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	4.52U	542	586	108	542	573	106	77-121	2.20	(< 20)
Ethylbenzene	9.05U	542	577	106	542	573	106	76-122	0.63	(< 20)
o-Xylene	9.05U	542	588	109	542	590	109	77-123	0.28	(< 20)
P & M -Xylene	18.1U	1080	1170	108	1080	1170	108	77-124	0.39	(< 20)
Toluene	9.05U	542	568	105	542	566	104	77-121	0.45	(< 20)
Xylenes (total)	27.1U	1630	1760	108	1630	1760	108	78-124	0.16	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		542	547	101	542	551	102	71-136	0.82	
4-Bromofluorobenzene (surr)		904	702	78	904	686	76	55-151	2.30	
Toluene-d8 (surr)		542	544	100	542	547	101	85-116	0.53	

Batch Information

Analytical Batch: VMS21238
 Analytical Method: SW8260D
 Instrument: VRA Agilent GC/MS 7890B/5977A
 Analyst: S.S
 Analytical Date/Time: 10/1/2021 2:12:00PM

Prep Batch: VXX37956
 Prep Method: Vol. Extraction SW8260 Field Extracted L
 Prep Date/Time: 10/1/2021 6:00:00AM
 Prep Initial Wt./Vol.: 69.14g
 Prep Extract Vol: 25.00mL



Method Blank

Blank ID: MB for HBN 1826538 [XXX/45673]

Blank Lab ID: 1639962

QC for Samples:

1216469001, 1216469002

Matrix: Soil/Solid (dry weight)

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	10.0U	20.0	9.00	mg/kg
Surrogates				
5a Androstane (surr)	85.5	60-120		%

Batch Information

Analytical Batch: XFC16109

Analytical Method: AK102

Instrument: Agilent 7890B F

Analyst: IVM

Analytical Date/Time: 10/12/2021 2:45:00PM

Prep Batch: XXX45673

Prep Method: SW3550C

Prep Date/Time: 10/5/2021 7:54:12AM

Prep Initial Wt./Vol.: 30 g

Prep Extract Vol: 5 mL

Print Date: 10/14/2021 4:59:44PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1216469 [XXX45673]
 Blank Spike Lab ID: 1639963
 Date Analyzed: 10/12/2021 14:55

Spike Duplicate ID: LCSD for HBN 1216469
 [XXX45673]
 Spike Duplicate Lab ID: 1639964
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1216469001, 1216469002

Results by AK102

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	667	641	96	667	684	103	(75-125)	6.50	(< 20)
Surrogates									
5a Androstane (surr)	16.7		93	16.7		99	(60-120)	5.80	

Batch Information

Analytical Batch: **XFC16109**
 Analytical Method: **AK102**
 Instrument: **Agilent 7890B F**
 Analyst: **IVM**

Prep Batch: **XXX45673**
 Prep Method: **SW3550C**
 Prep Date/Time: **10/05/2021 07:54**
 Spike Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL

Print Date: 10/14/2021 4:59:47PM



e-Sample Receipt Form FBK

SGS Workorder #:

Stantec

Stantec

Review Criteria		Condition (Yes, No, N/A)	Exceptions Noted below	
Chain of Custody / Temperature Requirements			Yes	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A			
COC accompanied samples?	Yes			
DOD: Were samples received in COC corresponding coolers?	N/A			
<input checked="" type="checkbox"/> Yes **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required				
Temperature blank compliant* (i.e., 0-6 °C after CF)?		Cooler ID:	@	°C Therm. ID:
		Cooler ID:	@	°C Therm. ID:
		Cooler ID:	@	°C Therm. ID:
		Cooler ID:	@	°C Therm. ID:
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.				
*If >6°C, were samples collected <8 hours ago?		Yes		
If <0°C, were sample containers ice free?				
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.				
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.		
Do samples match COC ** (i.e., sample IDs, dates/times collected)?	N/C			
**Note: If times differ <1hr, record details & login per COC.				
***Note: If sample information on containers differs from COC, SGS will default to COC information				
Were samples in good condition (no leaks/cracks/breakage)?	Yes			
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals))	Yes			
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes			
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A			
Were all soil VOAs field extracted with MeOH+BFB?	N/C			
For Rush/Short Hold Time, was RUSH/Short HT email sent?	N/A			
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.				
Additional notes (if applicable):				
SGS Profile #			0	



e-Sample Receipt Form

SGS Workorder #:

1216469

1216469

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements	Yes	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	Yes	1F,1B
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?		
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 1.1 °C Therm. ID: D52
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	Yes	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples match COC** (i.e., sample IDs, dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals))	Yes	
Were proper containers (type/mass/volume/preservative***) used?	Yes	N/A ***Exemption permitted for metals (e.g,200.8/6020B).
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	Yes	
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1216469001-A	No Preservative Required	OK			
1216469001-B	Methanol field pres. 4 C	OK			
1216469002-A	No Preservative Required	OK			
1216469002-B	Methanol field pres. 4 C	OK			
1216469003-A	Methanol field pres. 4 C	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM - The container was received damaged.

FR - The container was received frozen and not usable for Bacteria or BOD analyses.

IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.

NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

QN - Insufficient sample quantity provided.