SUNOCO PIPELINE
An ENERGY TRANSFER Company

535 Fritztown Road
Sinking Spring, PA 19608

February 27, 2018

Via Electronic and First-Class Mail
Dana Drake, P.E.
Environmental Program Manager
Waterway and Wetlands Program
Pennsylvania Department of Environmental Protection
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222-4745

Re: Hydrogeological Reevaluation Report
Hildenbrand Road Crossing (S1B-0190)
Permit No. E65-973
Sewickley Township, Westmoreland County

Dear Ms. Drake:

In compliance with the Corrected Stipulated Order dated August 10, 2017 a Reevaluation Report on the above-referenced horizontal directional drill ("HDD") was submitted to the Department on November 27, 2017. The Department requested more information on the Reevaluation Report by letter dated December 15, 2017, to which Sunoco Pipeline, LP (SPLP) responded to on January 4, 2018. In a letter dated February 8, 2018, the Department is requesting further information. Please accept this letter as a response. Your requests are bolded below followed by the response.

1. In its response to Item 2.b of DEP's December 15th letter, SPLP states that HDD activities could affect individual well use during active drilling for wells located within 150 linear feet of either side of the profile. SPLP offers no justification of how the 150 linear feet designation was determined. Please provide justification, sealed by a Pennsylvania Professional Geologist, that wells outside of 150 feet of the profile will not be impacted.

1.a. In addition, in order to resolve this issue, SPLP needs to enter into written agreements with all private water supply owners whose water supplies may be impacted by this drill as part of this reevaluation and in advance of commencing the HDD. This includes water supply owners greater than 150 linear feet from the profile if it is determined that there may be impacts to the water supply. Under the agreements, SPLP must provide temporary and if necessary, permanent, replacement potable water supplies adequate in quantity and quality for the purposes served, to the satisfaction of all potentially affected water supply owners. SPLP shall provide proof of these agreements to the DEP with a response to this letter. The agreements should provide for SPLP to conduct water quality and quantity testing of each potentially affected water supply prior to, during, and after the HDD activities.

On February 23, 2018, SPLP received a letter from Domenic Rocco at the Department, which clarified requests 1. and 1.a. Specifically, Mr. Rocco's letter allowed SPLP to respond to these requests by providing a discussion of actions that SPLP will take to avoid impacts to water supplies, other than entering into agreements with landowners for alternative potable water supplies. In accordance with that clarification, SPLP provides the following response.

SPLP provided notice and offered temporary water supplies to all water supply owners within 450 feet of HDD profiles. Significantly, the facts regarding water supply wells within 450 feet of the HDD profile are:

(i) There are eight parcels with water supply wells within 450 feet of this HDD profile. All have received written notification that they are entitled to temporary water supplies at this time.

(ii) Four of those parcels are on public water. As set forth below, one of those parcels also has a private well.

(iii) Two parcels have no water supply wells.

(iv) The remaining two parcels have three private water supply wells total and have accepted temporary water for these parcels.

(v) As noted above, one of the four parcels with public water for its residence, also has a private well for its barn which houses a horse. The water supply owner has declined SPLP's offer for temporary water for the barn, but there is no exposure at the residence.

In essence, the only potential impact to a water supply well within 450 feet of the HDD that has not accepted a temporary water supply is an owner who has public water for his residence and has refused a temporary alternative water supply for his horse barn.

Despite these facts, SPLP's goal, as demonstrated above, is to minimize any potential impacts to water supply wells. To that end, SPLP will take the following additional action:

During the progression of the pilot hole phase on this HDD, SPLP will add DrilPlex to its drilling mud for the first 900 ft of progress. DrilPlex is an ANSI/NSF-60 approved drinking water certified additive that allows the drilling mud to gel in the formation thereby minimizing the risk of impact to any of the nearby wells in question. SPLP will add DrilPlex in a 1:10 ratio to the raw bentonite during mixing of the drilling fluid, in accordance with the manufacturer's recommendations. In addition, SPLP intends to follow all conditions included as part of DrilPlex's ANSI/NSF-60 certification. An application guide and Safety Data Sheet for DrilPlex is provided as Attachment 1 for the Department's reference.

2. In its response to Item 2.b of DEP's December 15th letter, SPLP states that all landowners with property located within 450 feet of the Right-of-Way (ROW) were sent a notification letter. DEP requests copies of all letters sent to individual landowners within the 450 feet of the HDD. Please provide both a redacted version for posting on DEP's webpage and an unredacted copy of each letter for our information. DEP also requests the property owners' response to the notifications, if any were received by SPLP. Please provide both a redacted (landowner information) and unredacted copy of each response.

Attachment 2 to this response is a copy of the letters sent from SPLP to the individual landowners, and any responses if received.

3. Additionally, DEP requests the following information related to the project's potential effect on well production zones and water supplies:

a. An analysis of private water supply well production zones and how the proposed HDD activities interact with them (listing the depths of wells and pumps is insufficient).

As stated in paragraph 4 on page 3 in Reevaluation report for this HDD, *"The production zone for waters wells is from the well bottom to highest point of water inflow from the water bearing seams, joints, and fractures in the rock formation."* Water wells in bedrock can only pump water from inside the surface casing and open rock interval within the bore annulus, and water volume from the top water elevation down to the pump intake.

SPLP believes the intended subject matter of the question listed in Item 3.a. is the "recharge" of these wells from the surrounding geologic formation.

As stated in the Reevaluation Report in the Hydrogeology section, *"Groundwater is stored and moves within the network of fractured Waynesburg Formation and Monongahela Group bedrock."* To explain further, this means that available groundwater is stored within, and moves through, fissures and bedding plane partings in the bedrock. A water well in a bedrock formation is a simple vertical hole in the bedrock that intercepts water bearing fissures and bedding plane partings and provides an open vertical annulus for the water within the bedrock to flow into and fill (recharge) with a volume of water rising towards the land's surface until equilibrium with the piezometric surface in bedrock formation is achieved.

Any technically defensible analysis of this subject in this unique geology is dependent upon information on the orientation of the fissures and bedding plane partings; their width; do they dip or incline; and to what extent hydrostatic forces or the effects of gravity influence the movement of water in these bedrock features. This information, however, cannot be determined for a given well location in this geology even with extensive geologic coring and water investigation because the bedrock characteristics for these features and behavior can vary significantly in each core. Furthermore, the private water supply yields are governed by well construction and resulting well

efficiency and its relation to the available water bearing fissures and bedding plane parting horizons they intercept and does not reflect a homogenous consistency as seen in layered unconsolidated aquifers.

In addition, the effect of the HDD on a given water supply well will depend upon the level of use and resultant groundwater draw at a specific time. According to water use data published by Pennsylvania State University (https://extension.psu.edu/water-system-planning-estimating-water-needs), in general, a household will use 50 to 100 gallons per person per day (200 to 400 gallons per day for a family of four). For a drilled well, the borehole provides a significant amount of water storage. A typical 6-inch-diameter well will store about 1.5 gallons of water for every foot of standing water in the borehole and a 10-inch well stores about 4 gallons of water per foot. Therefore, a 6-inch-diameter well with about 100 feet of standing water in the borehole would contain about 150 gallons of stored water.

Use of this water and the resulting draw upon adjacent groundwater within the fractured bedrock is cyclic throughout the day, with the greatest demand occurring during morning and evening hours and on weekend days and holidays when residents are generally home.

In sum, the variability of the well yield and production can and often varies greatly over relatively short distances and time periods in these complex rock formations. The well production can be influenced by seasonal variability in precipitation, well construction, well consumption rates, recharge rates, infiltration rates, radius of influence (ROI) of other well systems, multiple production zones, and known and unknown geologic structural features (i.e., fissures, bedding planes and rock type). For these reasons discussed above, and consistent with the permit and incorporated plans, as amended, SPLP will offer baseline, active drilling, and post drilling monitoring of all wells in the 450 feet buffer zone. This data will be used to evaluate the water chemistry and other physical characteristics of the water quality at the specific well location before, during and after construction, and if an impact occurs, the permit requires replacement of the water supply to the satisfaction of the well owner.

b. A map showing all the private water supplies in the correct, surveyed locations.

The water supply illustration provided to the department with the January 4, 2018 response is an accurate presentation of the known water supply wells. The well locations were recorded by GPS.

c. A description of the following: if there is short tripping of the tooling during the HDD, what are the chances of a plunger-effect occurring during either the drilling or reaming phases or during pipe pullback, and could this affect private water supplies?

The "plunger effect" is only a concern during the complete removal of stem and tooling during the pilot phase of a HDD, since there is only one exit annulus for any pressures created while returning the tool and drive stem to the bedrock face for continued progress.

By contrast, during a routine "short-tripping" of the drilling stem and tooling, the length of tripping is only as long as needed, typically 2-5 joints of drilling stem (60-150 ft long), to ensure that the annulus surrounding the drill stem is not blocked and full circulation of return is being maintained. As a result, the return trip or "re-insertion" is so minor in extent that it does not create a "plunger effect" since the drilling fluids and cuttings have no settling time for phase separation to occur.

Similarly, there is no plunger effect during the reaming phase of an HDD since an open pathway exists between the entry and exit.

d. Water quality sample results of the private water supplies that may be affected.

Attachment 3 to this response contains all water quality samples from water supply wells within 450 ft of the HDD profile that SPLP has obtained to date.

e. Water quantity test results (pump yield tests) of the private water supplies that may be affected.

SPLP has notified each water supply well owner within 450 feet of the HDD profile that they have the option to have water quantity tests of their well. To date, water supply well owners have not asked to perform any water quantity tests at any well location.

SPLP submits that we have been, and are, in complete compliance with the agreed terms and requirements of analysis of the Order, as agreed to by the Department, and that no further analysis is required for the Department to consent to the start of this HDD. SPLP therefore requests that the Department approve the Reevaluation Report for Hildenbrand Road Horizontal Directional Drills (S2-0157) as soon as possible.

Sincerely,

Matthew Gordon
Project Director

Attachment 1

DrilPlex; Additive Use, and Safety Data Sheet

MI SWACO
A Schlumberger Company

DRILPLEX

DRILPLEX* Mixed Metal Oxide (MMO) is a bentonite extender and secondary shale stabilizer designed to give improved carrying capacity and suspending ability in water-base drilling fluids.

It has particular application in drilling of high-angle and horizontal wells, lost circulation zones, production reservoirs as a reservoir drill-in fluids (RDF) and for casing milling operations. It is effective over a broad range of temperatures.

Typical Physical Properties

Physical appearance	Granular, free flowing, off-white powder
Odor	Odorless
Specific gravity	2.6 – 2.9
pH	9.5 – 10.0 (1% slurry in water)
Solubility (in water)	Slight
Bulk density	40.51 lb/ft³ (648 kg/m³)

Applications

DRILPLEX mixed metal oxide extends the rheology of bentonite slurries by adsorbing onto the clay platelets to form a strong, stable complex that is sensitive to anionic products and some salts. It provides improvements in shale stabilization and solids tolerance.

The addition of this product structures the bentonite to produce a very flat, shear-thinning rheological profile with low plastic viscosity, high yield point and flat gel strengths.

The high viscosities achieved at lower shear rates (3 and 6 rpm) allow excellent hole cleaning capabilities and suspension properties and reduced flow through fractures. Flow at the wellbore face is low-to-zero, so mechanical washout is minimized.

The DRILPLEX bentonite complex is an excellent bridging agent and acts to prevent solids invasion when drilling into many reservoirs. The filtercake is external and easily removed.

DRILPLEX extender is not compatible with anionic materials. The use of dispersants and anionic polymers (such as CMC and PAC) will destroy the rheological advantages.

A 1:10 ratio of DRILPLEX extender to bentonite specially designed for this application is normally recommended although salinity and density affect the ratio. Typical concentrations are 0.8 to 1.2 lb/bbl (2.3 to 3.4 kg/m) of DRILPLEX extender and 8 to 12 lb/bbl (23 to 34 kg/m) of bentonite.

Higher concentrations may be needed for casing milling applications. The ratio of DRILPLEX extender to bentonite should be increased to 1:8 for reservoir drilling to ensure that an excess of polymer is present.

Advantages

- Excellent milling fluid
- Protects reservoir from solids invasion
- Minimizes mechanical washout
- Superior hole cleaning and suspension
- Controls losses

Limitations

- Sensitive to dispersants and anionic polymers

Toxicity and Handling

Bioassay information is available upon request.

Handle as an industrial chemical, wearing protective equipment and observing the precautions as described in the Material Safety Data Sheet (MSDS).

Packaging and Storage

DRILPLEX extender is packaged in 25-lb (11.35-kg) multi-wall, polyester bags, impregnated with a 1.0-mm aluminum liner.

Store in a dry location away from sources of heat or ignition, and minimize dust.

MS-10413 6/04

M-I SWACO
A Schlumberger Company

P.O. Box 42842
Houston, Texas 77242-2842
www.miswaco.com
E-mail: questions@miswaco.com

SAFETY DATA SHEET
DRILPLEX*

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name DRILPLEX*

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Rheology modifier

1.3. Details of the supplier of the safety data sheet

Supplier
M-I Australia Pty Ltd
Level 11
251 Adelaide Terrace
Perth
WA 6000
T = 08 9440 2900

Manufacturer
M-I SWACO
A Schlumberger Company
Endeavour Drive
Arnhall Business Park, Westhill
Aberdeen AB32 6UF
Scotland UK
T = +44 (0)1224-742200
F = +44 (0)1224-742288
E-mail = MBXMSDS-EH@miswaco.slb.com

1.4. Emergency telephone number

(24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600.

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (1999/45/EEC) Not classified.

2.2. Label elements

Risk Phrases

NC Not classified.

Safety Phrases

NC Not classified.

2.3. Other hazards

Not Classified as PBT/vPvB by current EU criteria.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

ALUMINIUM OXIDE/HYDROXIDE	30-60%
Classification (EC 1272/2008) Not classified.	Classification (67/548/EEC) Not classified.

UREA		10-30%
CAS-No.: 57-13-6	EC No.: 200-315-5	

Classification (EC 1272/2008)	Classification (67/548/EEC)
Not classified.	Not classified.

MAGNESIUM OXIDE		10-30%

Classification (EC 1272/2008)	Classification (67/548/EEC)
Not classified.	Not classified.

SODIUM CARBONATE		1-5%
CAS-No.: 497-19-8	EC No.: 207-838-8	

Classification (EC 1272/2008)	Classification (67/548/EEC)
Eye Irrit. 2 - H319	Xi;R36

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Composition Comments

The data shown is in accordance with the latest EC Directives.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation

Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

Ingestion

Do not induce vomiting. Immediately give a couple of glasses of water or milk, provided the victim is fully conscious. Get medical attention if any discomfort continues.

Skin contact

Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.

Eye contact

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Inhalation.

Irritation of nose, throat and airway.

Ingestion

Nausea, vomiting.

Skin contact

Prolonged skin contact may cause redness and irritation.

Eye contact

Irritating and may cause redness and pain.

4.3. Indication of any immediate medical attention and special treatment needed

Get medical attention if any discomfort continues.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media

Use fire-extinguishing media appropriate for surrounding materials.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

When heated, vapours/gases hazardous to health may be formed.

Unusual Fire & Explosion Hazards

High concentrations of dust may form explosive mixture with air.

5.3. Advice for firefighters

Special Fire Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Do not allow to enter drains, sewers or watercourses.

6.3. Methods and material for containment and cleaning up

Avoid generation and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. Product becomes slippery when wet.

6.4. Reference to other sections

Wear protective clothing as described in Section 8 of this safety data sheet.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid inhalation of dust and contact with skin and eyes. Avoid handling which leads to dust formation.

7.2. Conditions for safe storage, including any incompatibilities

Store in tightly closed original container in a dry, cool and well-ventilated place.

7.3. Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Name	STD	TWA - 8 Hrs		STEL - 15 Min		Notes
ALUMINIUM OXIDE/HYDROXIDE	WEL		10 mg/m3			
MAGNESIUM OXIDE	WEL		10 mg/m3			as Mg

WEL = Workplace Exposure Limit.

SODIUM CARBONATE (CAS: 497-19-8)

DNEL

Inhalation.	Long Term	Local Effects	10 mg/m³
Inhalation.	Short Term	Local Effects	10 mg/m³

UREA (CAS: 57-13-6)

DNEL

Dermal	Short Term	Systemic Effects	580 mg/kg
Inhalation.	Short Term	Systemic Effects	292 mg/m³
Dermal	Long Term	Systemic Effects	580 mg/kg
Inhalation.	Long Term	Systemic Effects	292 mg/m³

PNEC

Freshwater	0.047 mg/L

8.2. Exposure controls

Protective equipment

Process conditions

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures

Provide adequate general and local exhaust ventilation.

Respiratory equipment

No specific recommendation made, but respiratory protection may still be required under exceptional circumstances when excessive air contamination exists. Wear mask supplied with: Dust filter P2 (for fine dust).

Hand protection

Use protective gloves made of: Neoprene. or Nitrile.

Eye protection

Wear approved chemical safety goggles where eye exposure is reasonably probable.

Other Protection

Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Powder, dust
Colour	Off-white
Odour	Odourless.
Solubility	Slightly soluble in water.
Relative density	2.6 - 2.9 sg @20°C
Bulk Density	650 - 800 kg/m3
pH-Value, Diluted Solution	9.0 - 10.5 @ 1%

9.2. Other information

Not relevant

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions

Not known.

10.4. Conditions to avoid

Avoid wet and humid conditions.

10.5. Incompatible materials

Materials To Avoid

Not known.

10.6. Hazardous decomposition products

When heated, vapours/gases hazardous to health may be formed.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Aspiration hazard:

Not anticipated to present an aspiration hazard based on chemical structure.

Inhalation

Dust may irritate respiratory system or lungs.

Ingestion

May cause gastric distress, nausea and vomiting if ingested.

Skin contact

Prolonged and frequent contact may cause redness and irritation.

Eye contact

Particles in the eyes may cause irritation and smarting.

Route of entry

No route of entry noted.

Target Organs

No specific target organs noted

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Contact M-I SWACO's QHSE Department for ecological information at env@miswaco.slb.com.

12.1. Toxicity

Acute Fish Toxicity

Not considered toxic to fish.

12.2. Persistence and degradability

Degradability

There are no data on the degradability of this product.

12.3. Bioaccumulative potential

Bioaccumulative potential

No data available on bioaccumulation.

12.4. Mobility in soil

Mobility:

Slightly soluble in water.

12.5. Results of PBT and vPvB assessment

Not Classified as PBT/vPvB by current EU criteria.

12.6. Other adverse effects

None known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover and reclaim or recycle, if practical. Dispose of waste and residues in accordance with local authority requirements.

SECTION 14: TRANSPORT INFORMATION

General The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally Hazardous Substance/Marine Pollutant

No.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Uk Regulatory References

Chemicals (Hazard Information & Packaging) Regulations. Control of Substances Hazardous to Health Regulations 2002 (as amended) Workplace Exposure Limits EH40.

EU Legislation

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

Water hazard classification

WGK 1

New Zealand Hazard Classification

Not Classified.

HSNO Approval No.

Not required.

15.2. Chemical Safety Assessment

International Chemical Inventories

Contact REACH@miswaco.slb.com for REACH information. Complies with the following national/regional chemical inventory requirements: Canada (DSL / NDSL), China (IECSC), Europe (EINECS / ELINCS), Japan (METI / ENCS), New Zealand (NZIoC), Phillipines (PICCS),

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms used in the safety data sheet

*a mark of M-I L.L.C.

General information

HMIS Health - 2 HMIS Flammability - 1 HMIS Physical Hazard - 0 E - Safety glasses, Gloves, Dust Respirator

Information Sources

Product information provided by the commercial vendor(s). Material Safety Data Sheet, Misc. manufacturers. LOLI. European Chemicals Bureau - ESIS (European Chemical Substances Information).

Revision Comments

General revision. Compiled or revised by Sandra McWilliam

Issued By	Bill Cameron
Revision Date	17-Apr-12
Revision	4
Supersedes date	05-May-09
SDS No.	12564

Risk Phrases In Full

R36	Irritating to eyes.
NC	Not classified.

Hazard Statements In Full

H319	Causes serious eye irritation.

Attachment 2

Landowner Communications

SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

November 27, 2017

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 3693

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling – HDD Reevaluation Report
for HDD No. S1B-0190/PA-WM1-0023.0000-RR
Tract #: [redacted]

Dear [redacted]

Sunoco Pipeline L.P. ("SPLP") is writing to inform you that certain construction activity known as Horizontal Directional Drilling ("HDD") for Mariner East 2, also known as the Pennsylvania Pipeline Project, is located within 450 feet of your property boundary. Pursuant to the terms of a Stipulated Order entered by the Pennsylvania Environmental Hearing Board, SPLP has agreed to perform a reevaluation of this HDD location. The Stipulated Order requires SPLP to send a copy of the enclosed HDD Reevaluation Report to all landowners who have a private water supply/well that is located within 450 feet of the HDD.

If you have a private water supply/well that is located within 450 feet of the HDD No. S1B-0190, you can submit comments on the enclosed HDD Reevaluation Report to the Pennsylvania Department of Environmental Protection ("PADEP") within fourteen (14) days of the date of this letter. Comments must be submitted to PADEP at:

Karyn Yordy
Executive Assistant, Office of Programs
Department of Environmental Protection
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101
Email: kyordy@pa.gov
Phone: (717) 772-5906; Fax: (717) 705-4980

The Stipulated Order and a copy of the enclosed HDD Reevaluation Report are available for review on the Mariner East 2 Project website maintained by PADEP, which can be accessed at: http://www.dep.pa.gov/Business/ProgramIntegration/Pennsylvania-Pipeline-Portal/Pages/Mariner-East-II.aspx.

Thank you.

Mark McConnell
Land Project Manager
Representing Sunoco Pipeline L.P.
Office: (814) 204-0450

SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

November 27, 2017

BY CERTIFIED AND FIRST CLASS MAIL
7015 17300000 9109 3747

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling – HDD Reevaluation Report
for HDD No. S1B-0190/PA-WM1-0023.0000-RR
Tax Parcel ID #: [redacted]

Dear [redacted]

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Karyn Yordy
Executive Assistant, Office of Programs
Department of Environmental Protection
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101
Email: kyordy@pa.gov
Phone: (717) 772-5906; Fax: (717) 705-4980

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Thank you.

Mark McConnell
Land Project Manager
Representing Sunoco Pipeline L.P.
Office: (814) 204-0450

SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

November 27, 2017

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 3754

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling – HDD Reevaluation Report
for HDD No. S1B-0190/PA-WM1-0023.0000-RR
Tract #: [redacted]

Dear [redacted]

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If you have a private water supply/well that is located within 450 feet of the HDD No. S1B-0190, you can submit comments on the enclosed HDD Reevaluation Report to the Pennsylvania Department of Environmental Protection ("PADEP") within fourteen (14) days of the date of this letter. Comments must be submitted to PADEP at:

Karyn Yordy
Executive Assistant, Office of Programs
Department of Environmental Protection
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101
Email: kyordy@pa.gov
Phone: (717) 772-5906; Fax: (717) 705-4980

The Stipulated Order and a copy of the enclosed HDD Reevaluation Report are available for review on the Mariner East 2 Project website maintained by PADEP, which can be accessed at: http://www.dep.pa.gov/Business/ProgramIntegration/Pennsylvania-Pipeline-Portal/Pages/Mariner-East-II.aspx.

Thank you.

Mark McConnell
Land Project Manager
Representing Sunoco Pipeline L.P.
Office: (814) 204-0450

SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

November 27, 2017

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 3761

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling – HDD Reevaluation Report
for HDD No. S1B-0190/PA-WM1-0023.0000-RR
Tax Parcel ID #: [redacted]

Dear [redacted]

Sunoco Pipeline L.P. ("SPLP") is writing to inform you that certain construction activity known as Horizontal Directional Drilling ("HDD") for Mariner East 2, also known as the Pennsylvania Pipeline Project, is located within 450 feet of your property boundary. Pursuant to the terms of a Stipulated Order entered by the Pennsylvania Environmental Hearing Board, SPLP has agreed to perform a reevaluation of this HDD location. The Stipulated Order requires SPLP to send a copy of the enclosed HDD Reevaluation Report to all landowners who have a private water supply/well that is located within 450 feet of the HDD.

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SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

November 27, 2017

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 3778

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling – HDD Reevaluation Report
for HDD No. S1B-0190/PA-WM1-0023.0000-RR
Tract #: [redacted]

Dear [redacted]

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Thank you.

Mark McConnell
Land Project Manager
Representing Sunoco Pipeline L.P.
Office: (814) 204-0450

cc: [redacted]

[redacted]

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 3822

SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

November 27, 2017

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 3785

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling – HDD Reevaluation Report for HDD No. S1B-0190
Tract #: [redacted]

Dear [redacted]

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Thank you.

Mark McConnell
Land Project Manager
Representing Sunoco Pipeline L.P.
Office: (814) 204-0450

cc: [redacted]

[redacted]

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 3822

SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

November 27, 2017

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 3792

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling – HDD Reevaluation Report
for HDD No. S1B-0190/PA-WM1-0023.0000-RR
Tract #: [redacted]

Dear [redacted]

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Thank you.

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Land Project Manager
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Office: (814) 204-0450

SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

November 27, 2017

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 3808

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling – HDD Reevaluation Report
for HDD No. S1B-0190/PA-WM1-0023.0000-RR
Tax Parcel ID #: [redacted]

Dear [redacted]

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SUNOCO PIPELINE
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November 27, 2017

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 3815

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling – HDD Reevaluation Report
for HDD No. S1B-0190/PA-WM1-0023.0000-RR
Tract #: [redacted]

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Mark McConnell
Land Project Manager
Representing Sunoco Pipeline L.P.
Office: (814) 204-0450

SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

February 9, 2018

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 4010

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling Construction Notification
and Offer of Alternative Temporary Water Supply
Tract #: [redacted]

Dear [redacted]

Previously, Sunoco Pipeline L.P. ("SPLP") wrote to inform you that certain construction activity known as Horizontal Directional Drilling ("HDD") for Mariner East 2, also known as the Pennsylvania Pipeline Project, is located within 450 feet of your property boundary. In that letter, SPLP offered private water supply/well testing at SPLP's expense if you have a private water supply/well located within 450 feet of the HDD alignments. If you have not yet requested testing of your qualifying private water supply/well, but now would like SPLP to have your private water supply/well tested, please contact Maria Davis by calling 412-375-2000.

In addition, as part of this construction activity, SPLP is offering landowners with a private water supply/well located within 450 feet of the HDD alignments to be connected to an alternative temporary water supply, such as a water buffalo, that will be installed and maintained at SPLP's expense for the entire period of HDD operations.

If you would like to be connected to an alternative temporary water supply, please contact Maria Davis by calling 412-375-2000.

Thank you for your cooperation.

Mark McConnell
Land Project Manager
Representing Sunoco Pipeline L.P.
Office: (814) 204-0450

SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

February 9, 2018

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 4027

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling Construction Notification
and Offer of Alternative Temporary Water Supply
Tax Parcel ID #: [redacted]

Dear [redacted]

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SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

February 9, 2018

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 4034

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling Construction Notification
and Offer of Alternative Temporary Water Supply
Tract #: [redacted]

Dear [redacted]

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cc: [redacted]

[redacted]

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 4041

SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

February 9, 2018

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 4058

[redacted]

Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling Construction Notification
and Offer of Alternative Temporary Water Supply
Tract #: [redacted]

Dear [redacted]

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Land Project Manager
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Office: (814) 204-0450

cc: [redacted]

[redacted]

BY CERTIFIED AND FIRST CLASS MAIL
7015 1730 0000 9109 4041

Attachment 3

Water Quality Test Results

HDD S1B-0190 Hildenbrand Road
Water Supply Quality and Quantity Testing

- Parcel 58-10-00-0-050-00-000
  - This parcel is associated with two HDD installation; S1B-0190 (Hildenbrand Road) and S1B-0180 (Sewickly Creek). Although the well on the parcel was only sampled once for HDD S1B-0190, all of the lab results for samples collected in association with both HDD S1B-0190 and HDD S1B-0180 are included.
  - A yield test not performed because there was not a pump in the well at the times of water quality sampling.

- Parcel 58-10-00-0-132-00-000
  - There is a dug well and a drilled well located on this parcel. Both wells are able to supply water to the house on the parcel. During the water testing event, the dug well was not in use and a yield test was not conducted at the dug well because the interviewee was not able to switch the discharge from the drilled well source to the dug well source.

Yield Test Data Sheet

Test Date: 8/22/16	
Parcel Number: 58-10-00-0-132-00-000	
Sample ID: 08222016-499-02	
Landowner: Kenneth B. and Barbara A. Shoaf	

Time (Military)	Depth-to-Water (Feet)	Drawdown (Feet)	Flow Rate (Gallons per Minute)	Specific Capacity (Gallons Per Minute/Feet)	Remarks
12:00	17.96	0.0	0.0	NA	
12:05	18.44	0.5	6	12.5	
12:10	18.43	0.5	6	12.8	
12:15	18.69	0.7	6	8.2	
12:20	18.13	0.2	6	35.3	
12:25	18.38	0.42	6	14.3	
12:30	18.57	0.61	6	9.8	

- Parcel 58-11-00-0-010
  - A yield test not performed because landowner declined the yield test the day of the water sampling event.

ANALYTICAL REPORT

August 30, 2016

GES, Inc - Sunoco

Sample Delivery Group:	L855083
Samples Received:	08/23/2016
Project Number:	NA
Description:	Pre-Construction Sampling
Site:	ME2
Report To:	Stephanie Grillo 440 Creamery Way, Ste 500 Exton, PA 19341

Entire Report Reviewed By:

Mark W. Beasley
Technical Service Representative

TABLE OF CONTENTS

08222016-499-01 L855083-01 GW

Collected by: Zach P.
Collected date/time: 08/22/16 11:30
Received date/time: 08/23/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG901885	1	08/25/16 02:18	08/25/16 05:26	JM
Gravimetric Analysis by Method 2540 D-2011	WG901372	1	08/24/16 14:34	08/24/16 15:25	MMF
Metals (ICP) by Method 6010B	WG901411	1	08/24/16 10:22	08/25/16 02:07	LTB
Volatile Organic Compounds (GC) by Method RSK175	WG903014	1	08/29/16 09:15	08/29/16 09:15	MJ
Volatile Organic Compounds (GC/MS) by Method 8260B	WG902165	1	08/25/16 11:39	08/25/16 11:39	JAH
Wet Chemistry by Method 130.1	WG902150	5	08/25/16 15:59	08/25/16 15:59	JER
Wet Chemistry by Method 2130 B-2011	WG901317	1	08/23/16 12:00	08/23/16 12:00	JJL
Wet Chemistry by Method 2320 B-2011	WG901268	1	08/26/16 21:52	08/26/16 21:52	MCG
Wet Chemistry by Method 9040C	WG901334	1	08/24/16 14:17	08/24/16 14:17	MHM
Wet Chemistry by Method 9050A	WG901341	1	08/23/16 14:02	08/23/16 14:02	AMC
Wet Chemistry by Method 9056A	WG901918	1	08/26/16 21:42	08/26/16 21:42	SAM

All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Technical Service Representative

Sample Handling and Receiving

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

ESC Sample ID	Project Sample ID	Method
L855083-01	08222016-499-01	9040C

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	368		10.0	1	08/25/2016 05:26	WG901885

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	08/24/2016 15:25	WG901372

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness, Total (mg/L as CaCO3)	247		150	5	08/25/2016 15:59	WG902150

Wet Chemistry by Method 2130 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	NTU		NTU		date / time	
Turbidity	1.05		0.100	1	08/23/2016 12:00	WG901317

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	206		20.0	1	08/26/2016 21:52	WG901268

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.94		1	08/24/2016 14:17	WG901334

Sample Narrative:

9040C L855083-01 WG901334: 6.94 at 20.6c

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	umhos/cm			date / time	
Specific Conductance	533		1	08/23/2016 14:02	WG901341

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	08/26/2016 21:42	WG901918
Chloride	12.5		1.00	1	08/26/2016 21:42	WG901918
Sulfate	40.5		5.00	1	08/26/2016 21:42	WG901918

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.165		0.00500	1	08/25/2016 02:07	WG901411
Calcium	77.3		1.00	1	08/25/2016 02:07	WG901411
Iron	ND		0.100	1	08/25/2016 02:07	WG901411
Magnesium	18.0		1.00	1	08/25/2016 02:07	WG901411
Manganese	0.0903		0.0100	1	08/25/2016 02:07	WG901411
Potassium	7.57		1.00	1	08/25/2016 02:07	WG901411
Sodium	5.91		1.00	1	08/25/2016 02:07	WG901411

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	08/29/2016 09:15	WG903014
Ethane	ND		0.0130	1	08/29/2016 09:15	WG903014
Ethene	ND		0.0130	1	08/29/2016 09:15	WG903014
Propane	ND		0.0190	1	08/29/2016 09:15	WG903014

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	08/25/2016 11:39	WG902165
Toluene	ND		0.00500	1	08/25/2016 11:39	WG902165
Ethylbenzene	ND		0.00100	1	08/25/2016 11:39	WG902165
Total Xylenes	ND		0.00300	1	08/25/2016 11:39	WG902165
(S) Toluene-d8	*105*		*90.0-115*		*08/25/2016 11:39*	WG902165
(S) Dibromofluoromethane	*89.5*		*79.0-121*		*08/25/2016 11:39*	WG902165
(S) a,a,a-Trifluorotoluene	*96.4*		*90.4-116*		*08/25/2016 11:39*	WG902165
(S) 4-Bromofluorobenzene	*105*		*80.1-120*		*08/25/2016 11:39*	WG902165

Method Blank (MB)

(MB) R3159328-1 08/25/16 05:26

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L855023-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855023-01 08/25/16 05:26 • (DUP) R3159328-4 08/25/16 05:26

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	6560	6300	1	4.04		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159328-2 08/25/16 05:26 • (LCSD) R3159328-3 08/25/16 05:26

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Dissolved Solids	8800	8370	8430	95.1	95.8	85.0-115			0.714	5

Method Blank (MB)

(MB) R3159059-1 08/24/16 15:25

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Suspended Solids	U		0.350	2.50

L855079-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855079-01 08/24/16 15:25 • (DUP) R3159059-4 08/24/16 15:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	206	196	1	4.98		5

L855087-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855087-01 08/24/16 15:25 • (DUP) R3159059-5 08/24/16 15:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	360	361	1	0.370		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159059-2 08/24/16 15:25 • (LCSD) R3159059-3 08/24/16 15:25

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	792	764	102	98.8	85.0-115			3.60	5

Method Blank (MB)

(MB) R3159253-1 08/25/16 13:58

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hardness	4.50	J	1.43	30.0

L855012-08 Original Sample (OS) • Duplicate (DUP)

(OS) L855012-08 08/25/16 14:01 • (DUP) R3159253-4 08/25/16 14:02

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness	61.5	61.4	1	0.000		20

L855349-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855349-01 08/25/16 16:01 • (DUP) R3159253-8 08/25/16 16:02

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness	259	261	5	1.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159253-2 08/25/16 13:59 • (LCSD) R3159253-3 08/25/16 13:59

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hardness	150	150	153	100	102	85.0-115			2.00	20

L855352-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855352-01 08/25/16 14:21 • (MS) R3159253-6 08/25/16 14:22 • (MSD) R3159253-7 08/25/16 14:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hardness	100	156	267	256	111	100	1	80.0-120	E	E	4.00	20

Method Blank (MB)

(MB) WG901317-1 08/23/16 12:00

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	NTU		NTU	NTU
Turbidity	U		0.0310	0.100

L855065-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855065-01 08/23/16 12:00 • (DUP) WG901317-4 08/23/16 12:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	NTU	NTU		%		%
Turbidity	28.4	28.2	1	0.707		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG901317-2 08/23/16 12:00 • (LCSD) WG901317-3 08/23/16 12:00

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	NTU	NTU	NTU	%	%	%			%	%
Turbidity	40.0	43.4	42.8	109	107	90.0-110			1.39	20

Method Blank (MB)

(MB) R3159769-1 08/26/16 15:09

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Alkalinity	U		2.71	20.0

L854879-01 Original Sample (OS) • Duplicate (DUP)

(OS) L854879-01 08/26/16 15:56 • (DUP) R3159769-2 08/26/16 16:04

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	128	125	1	2.00		20

L854986-14 Original Sample (OS) • Duplicate (DUP)

(OS) L854986-14 08/26/16 21:24 • (DUP) R3159769-9 08/26/16 21:33

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	5.83	ND	1	200	P1	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159769-3 08/26/16 16:11 • (LCSD) R3159769-8 08/26/16 21:15

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Alkalinity	100	107	107	107	107	85.0-115			0.000	20

L854986-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L854986-10 08/26/16 20:18 • (MS) R3159769-4 08/26/16 20:24 • (MSD) R3159769-5 08/26/16 20:32

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Alkalinity	100	187	236	261	48.0	74.0	1	80.0-120	J6	J6	10.0	20

L854986-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L854986-11 08/26/16 20:40 • (MS) R3159769-6 08/26/16 20:46 • (MSD) R3159769-7 08/26/16 20:54

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Alkalinity	100	199	227	230	28.0	31.0	1	80.0-120	J6	J6	1.00	20

L854944-01 Original Sample (OS) • Duplicate (DUP)

(OS) L854944-01 08/24/16 14:17 • (DUP) WG901334-3 08/24/16 14:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	9.03	9.06	1	0.332		1

L855162-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855162-01 08/24/16 14:17 • (DUP) WG901334-4 08/24/16 14:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	9.08	9.09	1	0.110		1

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG901334-1 08/24/16 14:17 • (LCSD) WG901334-2 08/24/16 14:17

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.11	6.07	6.08	99.3	99.5	98.4-102			0.165	1

Method Blank (MB)

(MB) WG901341-4 08/23/16 14:02

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	umhos/cm		umhos/cm	umhos/cm
Specific Conductance	1.00			

L854879-01 Original Sample (OS) • Duplicate (DUP)

(OS) L854879-01 08/23/16 14:02 • (DUP) WG901341-1 08/23/16 14:02

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	664	666	1	0.301		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG901341-2 08/23/16 14:02 • (LCSD) WG901341-3 08/23/16 14:02

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	umhos/cm	umhos/cm	umhos/cm	%	%	%			%	%
Specific Conductance	542	552	550	102	101	90.0-110			0.363	20

Method Blank (MB)

(MB) R3159693-1 08/26/16 17:38

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.079	1.00
Chloride	U		0.0519	1.00
Sulfate	U		0.0774	5.00

L855135-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855135-01 08/26/16 20:45 • (DUP) R3159693-4 08/26/16 20:59

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	0.0869	0.0960	1	10	J	15
Chloride	37.9	37.8	1	0		15
Sulfate	U	0.000	1	0		15

L855138-03 Original Sample (OS) • Duplicate (DUP)

(OS) L855138-03 08/27/16 00:07 • (DUP) R3159693-6 08/27/16 00:21

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.000	1	0		15
Chloride	7.58	7.39	1	2		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159693-2 08/26/16 17:52 • (LCSD) R3159693-3 08/26/16 18:06

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromide	40.0	40.5	40.3	101	101	80-120			0	15
Chloride	40.0	39.5	39.5	99	99	80-120			0	15
Sulfate	40.0	40.3	40.1	101	100	80-120			0	15

L855137-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L855137-01 08/26/16 21:14 • (MS) R3159693-5 08/26/16 21:28

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	U	48.1	96	1	80-120	
Chloride	50.0	27.7	77.4	99	1	80-120	
Sulfate	50.0	13.5	63.7	100	1	80-120	

L855138-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855138-04 08/27/16 00:35 • (MS) R3159693-7 08/27/16 00:50 • (MSD) R3159693-8 08/27/16 01:04

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Bromide	50.0	ND	44.0	43.4	88	87	1	80-120			1	15
Chloride	50.0	6.85	56.9	57.2	100	101	1	80-120			1	15

Method Blank (MB)

(MB) R3159024-1 08/25/16 01:32

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.0017	0.00500
Calcium	U		0.0463	1.00
Iron	U		0.0141	0.100
Magnesium	0.0431	J	0.0111	1.00
Manganese	U		0.0012	0.0100
Potassium	0.182	J	0.102	1.00
Sodium	0.389	J	0.0985	1.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159024-2 08/25/16 01:35 • (LCSD) R3159024-3 08/25/16 01:37

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Barium	1.00	1.01	1.06	101	106	80-120			4	20
Calcium	10.0	10.6	10.9	106	109	80-120			3	20
Iron	10.0	9.79	10.2	98	102	80-120			4	20
Magnesium	10.0	10.5	10.8	105	108	80-120			3	20
Manganese	1.00	0.976	0.989	98	99	80-120			1	20
Potassium	10.0	9.75	10.1	98	101	80-120			4	20
Sodium	10.0	9.81	10.1	98	101	80-120			3	20

Method Blank (MB)

(MB) R3159861-1 08/29/16 09:10

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Methane	U		0.00291	0.0100
Ethane	U		0.00407	0.0130
Ethene	U		0.00426	0.0130
Propane	U		0.00548	0.0190

L855096-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855096-01 08/29/16 09:27 • (DUP) R3159861-2 08/29/16 09:43

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	0.572	0.575	1	0.490		20
Ethane	ND	0.000	1	0.000		20
Ethene	ND	0.000	1	0.000		20
Propane	ND	0.000	1	0.000		20

L855220-02 Original Sample (OS) • Duplicate (DUP)

(OS) L855220-02 08/29/16 09:51 • (DUP) R3159861-3 08/29/16 10:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	U	0.000	1	0.000		20
Ethane	U	0.000	1	0.000		20
Ethene	U	0.000	1	0.000		20
Propane	U	0.000	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159861-4 08/29/16 10:49 • (LCSD) R3159861-5 08/29/16 10:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Methane	0.0678	0.0664	0.0618	97.9	91.1	85.0-115			7.16	20
Ethane	0.129	0.121	0.122	93.4	94.6	85.0-115			1.19	20
Ethene	0.127	0.117	0.118	91.8	93.2	85.0-115			1.53	20
Propane	0.186	0.170	0.175	91.4	94.0	85.0-115			2.75	20

Method Blank (MB)

(MB) R3160243-3 08/25/16 10:40

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Benzene	U		0.000331	0.00100
Ethylbenzene	U		0.000384	0.00100
Toluene	U		0.000780	0.00500
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*106*			*90.0-115*
(S) Dibromofluoromethane	*90.0*			*79.0-121*
(S) a,a,a-Trifluorotoluene	*96.6*			*90.4-116*
(S) 4-Bromofluorobenzene	*104*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3160243-1 08/25/16 09:29 • (LCSD) R3160243-2 08/25/16 10:00

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Benzene	0.0250	0.0287	0.0256	115	102	73.0-122			11.3	20
Ethylbenzene	0.0250	0.0302	0.0282	121	113	80.9-121			6.92	20
Toluene	0.0250	0.0271	0.0238	108	95.0	77.9-116			13.2	20
Xylenes, Total	0.0750	0.0904	0.0851	121	113	79.2-122			6.07	20
(S) Toluene-d8				*102*	*99.8*	*90.0-115*				
(S) Dibromofluoromethane				*88.0*	*87.5*	*79.0-121*				
(S) a,a,a-Trifluorotoluene				*96.3*	*95.8*	*90.4-116*				
(S) 4-Bromofluorobenzene				*103*	*109*	*80.1-120*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

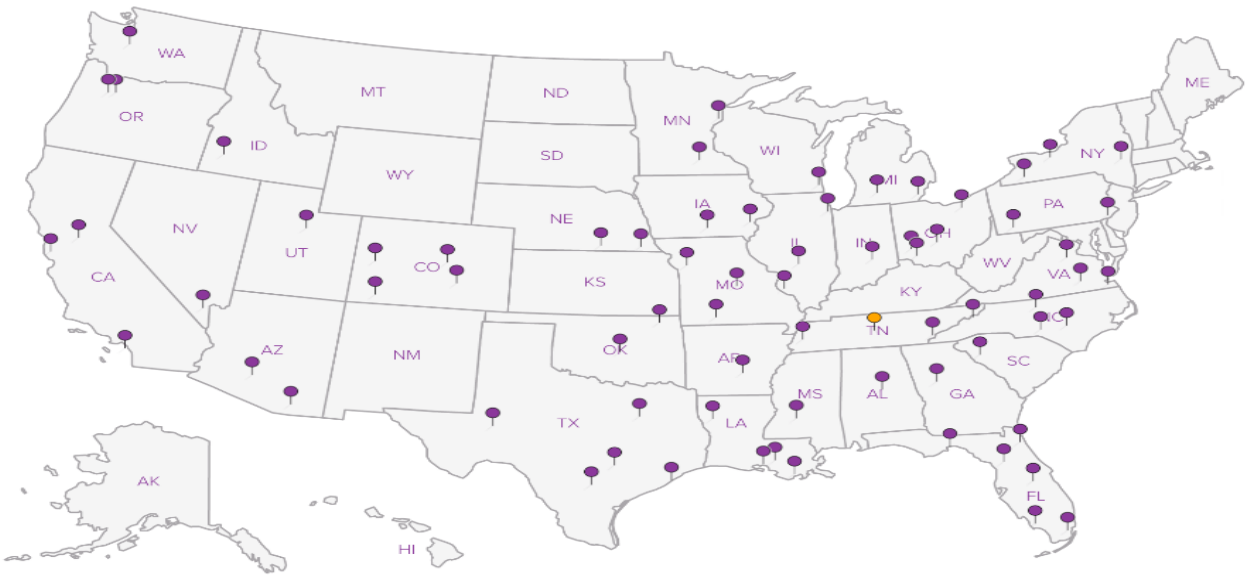
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Company Name/Address:
GES, Inc - Sunoco
440 Creamery Way, Suite 500
Exton, PA 19341

Billing Information:
Accounts Payable
440 Creamery Way, Suite 500
Exton, PA 19341

Report to: **Holly Smoker**

Email To: **hsmoker@gesonline.com**

Project Description: **Pre-Construction Sampling**

City/State Collected: Upper Newton, PA

Phone: **610-458-1077**
Fax: **NA**

Client Project # **NA**

Lab Project # **SUNGES-GRILLO**

Collected by (print): Zack Pavlovsky

Site/Facility ID # **ME2**

P.O. # **NA**

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	**pH,SPCON,TDS,TURB* 250mlHDPE-NoPres	**ALK, Br, Cl, SO4 250mlHDPE-NoPres	**Total Metals, Hardness 250mlHDPE-HNO3	**RSK175 + Propane 40mlAmb-HCl	**TSS 1L-HDPE NoPres	**V8260BTEX 40mlAmb-HCl				Rem./Contaminant	Sample # (lab only)
08222016-GG-01	Grab	GW		8/22/2016	1130	8	X	X	X	X	X	X						-01

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Metals = Ba,Ca,Fe,K,Mg,Mn,Na**

pH _____ Temp _____

Flow _____ Other _____

6827 1107 0488

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	8/22/2016	1700	8/22/2016 1700
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 3.2 °C Bottles Received: 8

Date: 8-23-16 Time: 9W

Hold #

Condition: (lab use only) W OK

COC Seal Intact: ✓Y ___N ___NA

pH Checked: <2 NCF:

Chain of Custody Page 1 of 1

ESC LAB SCIENCES
YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L855083
J132

Acctnum: SUNGES
Template: T114657
Prelogin: P564159
TSR: Mark Beasley
Cooler:
Shipped Via: Fed Ex

ESC LAB SCIENCES

YOUR LAB OF CHOICE

Cooler Receipt Checklist

Client: SUNGES SDG# L855083

Cooler Received/Opened On: 8-23-16 By Richard Hughes

Temperature Upon Receipt: 3.2 °c

(Signature)

Cooler Receipt Check List	Yes	No	N/A
Were custody seals on outside of cooler and intact?	✓		
Were custody papers properly filled out (ink, signed, etc.)?	✓		
Did all bottles arrive in good condition?	✓		
Were correct bottles used for the analyses requested?	✓		
Was sufficient amount of sample sent in each bottle?	✓		
Were correct preservatives used?	✓		
Were all applicable sample containers checked for preservation? (Any samples not in accepted pH range noted on COC .)	✓		
If applicable, was an observable VOA headspace present?		✓	
Non Conformance Generated? (If yes see attached NCF)		✓	

ANALYTICAL REPORT

August 30, 2016

GES, Inc - Sunoco

Sample Delivery Group:	L855087
Samples Received:	08/23/2016
Project Number:	NA
Description:	Pre-Construction Sampling
Site:	ME2
Report To:	Stephanie Grillo 440 Creamery Way, Ste 500 Exton, PA 19341

Entire Report Reviewed By:

Mark W. Beasley
Technical Service Representative

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08222016-499-03 L855087-01 GW

Collected by: Zach P.
Collected date/time: 08/22/16 13:15
Received date/time: 08/23/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG901885	1	08/25/16 02:18	08/25/16 05:26	JM
Gravimetric Analysis by Method 2540 D-2011	WG901372	1	08/24/16 14:34	08/24/16 15:25	MMF
Metals (ICP) by Method 6010B	WG901411	1	08/24/16 10:22	08/25/16 02:15	LTB
Volatile Organic Compounds (GC) by Method RSK175	WG903014	1	08/29/16 09:22	08/29/16 09:22	MJ
Volatile Organic Compounds (GC/MS) by Method 8260B	WG902165	1	08/25/16 12:20	08/25/16 12:20	JAH
Wet Chemistry by Method 130.1	WG902150	1	08/25/16 14:08	08/25/16 14:08	JER
Wet Chemistry by Method 2130 B-2011	WG901317	1	08/23/16 12:00	08/23/16 12:00	JJL
Wet Chemistry by Method 2320 B-2011	WG901268	1	08/26/16 22:06	08/26/16 22:06	MCG
Wet Chemistry by Method 9040C	WG901334	1	08/24/16 14:17	08/24/16 14:17	MHM
Wet Chemistry by Method 9050A	WG901341	1	08/23/16 14:02	08/23/16 14:02	AMC
Wet Chemistry by Method 9056A	WG901918	1	08/26/16 22:11	08/26/16 22:11	SAM

All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Technical Service Representative

Sample Handling and Receiving

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

ESC Sample ID	Project Sample ID	Method
L855087-01	08222016-499-03	9040C

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	260		10.0	1	08/25/2016 05:26	WG901885

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	360		2.50	1	08/24/2016 15:25	WG901372

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness, Total (mg/L as CaCO3)	194		30.0	1	08/25/2016 14:08	WG902150

Wet Chemistry by Method 2130 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	NTU		NTU		date / time	
Turbidity	43.9		0.100	1	08/23/2016 12:00	WG901317

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	113		20.0	1	08/26/2016 22:06	WG901268

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.89		1	08/24/2016 14:17	WG901334

Sample Narrative:

9040C L855087-01 WG901334: 6.89 at 20.2c

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	umhos/cm			date / time	
Specific Conductance	446		1	08/23/2016 14:02	WG901341

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	08/26/2016 22:11	WG901918
Chloride	16.5		1.00	1	08/26/2016 22:11	WG901918
Sulfate	37.5		5.00	1	08/26/2016 22:11	WG901918

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.0882		0.00500	1	08/25/2016 02:15	WG901411
Calcium	69.5		1.00	1	08/25/2016 02:15	WG901411
Iron	3.66		0.100	1	08/25/2016 02:15	WG901411
Magnesium	9.37		1.00	1	08/25/2016 02:15	WG901411
Manganese	0.289		0.0100	1	08/25/2016 02:15	WG901411
Potassium	2.72		1.00	1	08/25/2016 02:15	WG901411
Sodium	6.83		1.00	1	08/25/2016 02:15	WG901411

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	08/29/2016 09:22	WG903014
Ethane	ND		0.0130	1	08/29/2016 09:22	WG903014
Ethene	ND		0.0130	1	08/29/2016 09:22	WG903014
Propane	ND		0.0190	1	08/29/2016 09:22	WG903014

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	08/25/2016 12:20	WG902165
Toluene	ND		0.00500	1	08/25/2016 12:20	WG902165
Ethylbenzene	ND		0.00100	1	08/25/2016 12:20	WG902165
Total Xylenes	ND		0.00300	1	08/25/2016 12:20	WG902165
(S) Toluene-d8	*107*		*90.0-115*		*08/25/2016 12:20*	WG902165
(S) Dibromofluoromethane	*88.7*		*79.0-121*		*08/25/2016 12:20*	WG902165
(S) a,a,a-Trifluorotoluene	*98.8*		*90.4-116*		*08/25/2016 12:20*	WG902165
(S) 4-Bromofluorobenzene	*106*		*80.1-120*		*08/25/2016 12:20*	WG902165

Method Blank (MB)

(MB) R3159328-1 08/25/16 05:26

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Dissolved Solids	U		2.82	10.0

L855023-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855023-01 08/25/16 05:26 • (DUP) R3159328-4 08/25/16 05:26

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Dissolved Solids	6560	6300	1	4.04		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159328-2 08/25/16 05:26 • (LCSD) R3159328-3 08/25/16 05:26

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Dissolved Solids	8800	8370	8430	95.1	95.8	85.0-115			0.714	5

Method Blank (MB)

(MB) R3159059-1 08/24/16 15:25

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Suspended Solids	U		0.350	2.50

L855079-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855079-01 08/24/16 15:25 • (DUP) R3159059-4 08/24/16 15:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	206	196	1	4.98		5

L855087-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855087-01 08/24/16 15:25 • (DUP) R3159059-5 08/24/16 15:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	360	361	1	0.370		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159059-2 08/24/16 15:25 • (LCSD) R3159059-3 08/24/16 15:25

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	792	764	102	98.8	85.0-115			3.60	5

Method Blank (MB)

(MB) R3159253-1 08/25/16 13:58

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hardness	4.50	J	1.43	30.0

L855012-08 Original Sample (OS) • Duplicate (DUP)

(OS) L855012-08 08/25/16 14:01 • (DUP) R3159253-4 08/25/16 14:02

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness	61.5	61.4	1	0.000		20

L855349-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855349-01 08/25/16 16:01 • (DUP) R3159253-8 08/25/16 16:02

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness	259	261	5	1.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159253-2 08/25/16 13:59 • (LCSD) R3159253-3 08/25/16 13:59

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hardness	150	150	153	100	102	85.0-115			2.00	20

L855352-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855352-01 08/25/16 14:21 • (MS) R3159253-6 08/25/16 14:22 • (MSD) R3159253-7 08/25/16 14:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hardness	100	156	267	256	111	100	1	80.0-120	E	E	4.00	20

Method Blank (MB)

(MB) WG901317-1 08/23/16 12:00

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	NTU		NTU	NTU
Turbidity	U		0.0310	0.100

L855065-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855065-01 08/23/16 12:00 • (DUP) WG901317-4 08/23/16 12:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	NTU	NTU		%		%
Turbidity	28.4	28.2	1	0.707		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG901317-2 08/23/16 12:00 • (LCSD) WG901317-3 08/23/16 12:00

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	NTU	NTU	NTU	%	%	%			%	%
Turbidity	40.0	43.4	42.8	109	107	90.0-110			1.39	20

Method Blank (MB)

(MB) R3159769-1 08/26/16 15:09

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Alkalinity	U		2.71	20.0

L854879-01 Original Sample (OS) • Duplicate (DUP)

(OS) L854879-01 08/26/16 15:56 • (DUP) R3159769-2 08/26/16 16:04

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	128	125	1	2.00		20

L854986-14 Original Sample (OS) • Duplicate (DUP)

(OS) L854986-14 08/26/16 21:24 • (DUP) R3159769-9 08/26/16 21:33

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Alkalinity	5.83	ND	1	200	P1	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159769-3 08/26/16 16:11 • (LCSD) R3159769-8 08/26/16 21:15

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Alkalinity	100	107	107	107	107	85.0-115			0.000	20

L854986-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L854986-10 08/26/16 20:18 • (MS) R3159769-4 08/26/16 20:24 • (MSD) R3159769-5 08/26/16 20:32

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Alkalinity	100	187	236	261	48.0	74.0	1	80.0-120	J6	J6	10.0	20

L854986-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L854986-11 08/26/16 20:40 • (MS) R3159769-6 08/26/16 20:46 • (MSD) R3159769-7 08/26/16 20:54

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Alkalinity	100	199	227	230	28.0	31.0	1	80.0-120	J6	J6	1.00	20

L854944-01 Original Sample (OS) • Duplicate (DUP)

(OS) L854944-01 08/24/16 14:17 • (DUP) WG901334-3 08/24/16 14:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	9.03	9.06	1	0.332		1

L855162-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855162-01 08/24/16 14:17 • (DUP) WG901334-4 08/24/16 14:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	9.08	9.09	1	0.110		1

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG901334-1 08/24/16 14:17 • (LCSD) WG901334-2 08/24/16 14:17

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.11	6.07	6.08	99.3	99.5	98.4-102			0.165	1

Method Blank (MB)

(MB) WG901341-4 08/23/16 14:02

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	umhos/cm		umhos/cm	umhos/cm
Specific Conductance	1.00			

L854879-01 Original Sample (OS) • Duplicate (DUP)

(OS) L854879-01 08/23/16 14:02 • (DUP) WG901341-1 08/23/16 14:02

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	664	666	1	0.301		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG901341-2 08/23/16 14:02 • (LCSD) WG901341-3 08/23/16 14:02

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	umhos/cm	umhos/cm	umhos/cm	%	%	%			%	%
Specific Conductance	542	552	550	102	101	90.0-110			0.363	20

Method Blank (MB)

(MB) R3159693-1 08/26/16 17:38

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.079	1.00
Chloride	U		0.0519	1.00
Sulfate	U		0.0774	5.00

L855135-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855135-01 08/26/16 20:45 • (DUP) R3159693-4 08/26/16 20:59

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	0.0869	0.0960	1	10	J	15
Chloride	37.9	37.8	1	0		15
Sulfate	U	0.000	1	0		15

L855138-03 Original Sample (OS) • Duplicate (DUP)

(OS) L855138-03 08/27/16 00:07 • (DUP) R3159693-6 08/27/16 00:21

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.000	1	0		15
Chloride	7.58	7.39	1	2		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159693-2 08/26/16 17:52 • (LCSD) R3159693-3 08/26/16 18:06

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromide	40.0	40.5	40.3	101	101	80-120			0	15
Chloride	40.0	39.5	39.5	99	99	80-120			0	15
Sulfate	40.0	40.3	40.1	101	100	80-120			0	15

L855137-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L855137-01 08/26/16 21:14 • (MS) R3159693-5 08/26/16 21:28

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	U	48.1	96	1	80-120	
Chloride	50.0	27.7	77.4	99	1	80-120	
Sulfate	50.0	13.5	63.7	100	1	80-120	

L855138-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855138-04 08/27/16 00:35 • (MS) R3159693-7 08/27/16 00:50 • (MSD) R3159693-8 08/27/16 01:04

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Bromide	50.0	ND	44.0	43.4	88	87	1	80-120			1	15
Chloride	50.0	6.85	56.9	57.2	100	101	1	80-120			1	15

Method Blank (MB)

(MB) R3159024-1 08/25/16 01:32

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.0017	0.00500
Calcium	U		0.0463	1.00
Iron	U		0.0141	0.100
Magnesium	0.0431	J	0.0111	1.00
Manganese	U		0.0012	0.0100
Potassium	0.182	J	0.102	1.00
Sodium	0.389	J	0.0985	1.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159024-2 08/25/16 01:35 • (LCSD) R3159024-3 08/25/16 01:37

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Barium	1.00	1.01	1.06	101	106	80-120			4	20
Calcium	10.0	10.6	10.9	106	109	80-120			3	20
Iron	10.0	9.79	10.2	98	102	80-120			4	20
Magnesium	10.0	10.5	10.8	105	108	80-120			3	20
Manganese	1.00	0.976	0.989	98	99	80-120			1	20
Potassium	10.0	9.75	10.1	98	101	80-120			4	20
Sodium	10.0	9.81	10.1	98	101	80-120			3	20

Method Blank (MB)

(MB) R3159861-1 08/29/16 09:10

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Methane	U		0.00291	0.0100
Ethane	U		0.00407	0.0130
Ethene	U		0.00426	0.0130
Propane	U		0.00548	0.0190

L855096-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855096-01 08/29/16 09:27 • (DUP) R3159861-2 08/29/16 09:43

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	0.572	0.575	1	0.490		20
Ethane	ND	0.000	1	0.000		20
Ethene	ND	0.000	1	0.000		20
Propane	ND	0.000	1	0.000		20

L855220-02 Original Sample (OS) • Duplicate (DUP)

(OS) L855220-02 08/29/16 09:51 • (DUP) R3159861-3 08/29/16 10:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	U	0.000	1	0.000		20
Ethane	U	0.000	1	0.000		20
Ethene	U	0.000	1	0.000		20
Propane	U	0.000	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159861-4 08/29/16 10:49 • (LCSD) R3159861-5 08/29/16 10:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Methane	0.0678	0.0664	0.0618	97.9	91.1	85.0-115			7.16	20
Ethane	0.129	0.121	0.122	93.4	94.6	85.0-115			1.19	20
Ethene	0.127	0.117	0.118	91.8	93.2	85.0-115			1.53	20
Propane	0.186	0.170	0.175	91.4	94.0	85.0-115			2.75	20

Method Blank (MB)

(MB) R3160243-3 08/25/16 10:40

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Benzene	U		0.000331	0.00100
Ethylbenzene	U		0.000384	0.00100
Toluene	U		0.000780	0.00500
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*106*			*90.0-115*
(S) Dibromofluoromethane	*90.0*			*79.0-121*
(S) a,a,a-Trifluorotoluene	*96.6*			*90.4-116*
(S) 4-Bromofluorobenzene	*104*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3160243-1 08/25/16 09:29 • (LCSD) R3160243-2 08/25/16 10:00

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Benzene	0.0250	0.0287	0.0256	115	102	73.0-122			11.3	20
Ethylbenzene	0.0250	0.0302	0.0282	121	113	80.9-121			6.92	20
Toluene	0.0250	0.0271	0.0238	108	95.0	77.9-116			13.2	20
Xylenes, Total	0.0750	0.0904	0.0851	121	113	79.2-122			6.07	20
(S) Toluene-d8				*102*	*99.8*	*90.0-115*				
(S) Dibromofluoromethane				*88.0*	*87.5*	*79.0-121*				
(S) a,a,a-Trifluorotoluene				*96.3*	*95.8*	*90.4-116*				
(S) 4-Bromofluorobenzene				*103*	*109*	*80.1-120*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

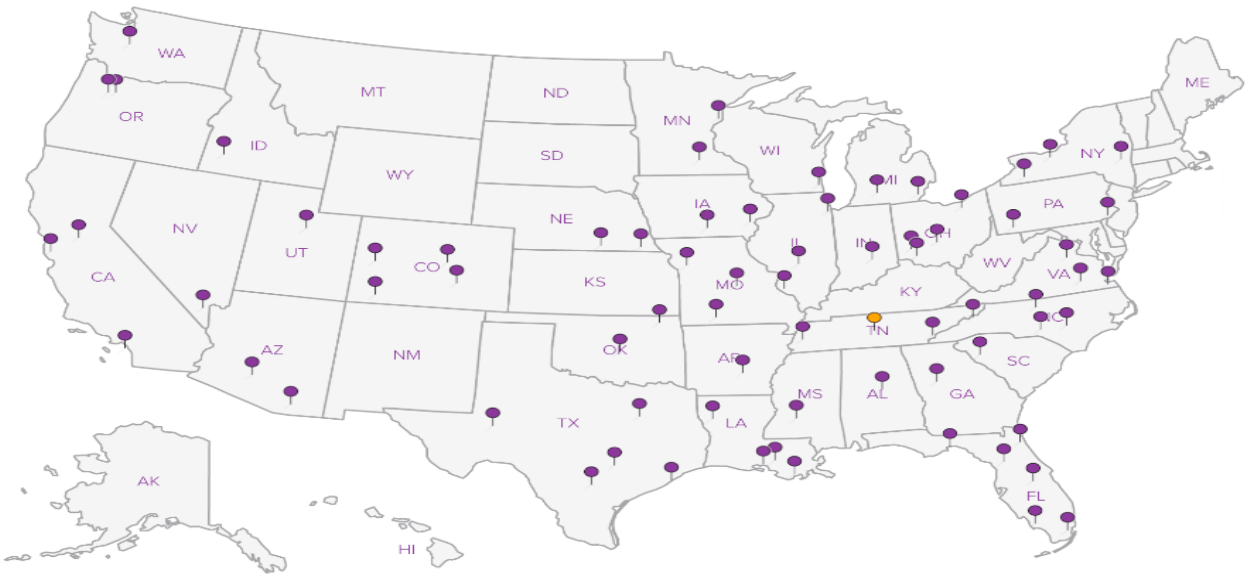
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Company Name/Address:
GES, Inc - Sunoco
440 Creamery Way, Suite 500
Exton, PA 19341

Billing Information:
Accounts Payable
440 Creamery Way, Suite 500
Exton, PA 19341

Report to: **Holly Smoker**

Email To: **hsmoker@gesonline.com**

Project Description: **Pre-Construction Sampling**

City/State Collected: West Newton, PA

Phone: **610-458-1077**
Fax: **NA**

Client Project # **NA**

Lab Project # **SUNGES-GRILLO**

Collected by (print): Zach Polansky

Site/Facility ID # **ME2**

P.O. # **NA**

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	**pH,SPCON,TDS,TURB* 250mlHDPE-NoPres	ALK, Br, Cl, SO4 250mlHDPE-NoPres	Total Metals, Hardness 250mlHDPE-HNO3 ✓✓	RSK175 + Propane 40mlAmb-HCl	TSS 1L-HDPE NoPres	V8260BTEX 40mlAmb-HCl					Rem./Contaminant	Sample # (lab only)
082220,8-4TA-03	Grab	GW		8/22/2016	1315	8	X	X	X	X	X	X						-4

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Metals = Ba,Ca,Fe,K,Mg,Mn,Na**

pH _____ Temp _____

Flow _____ Other _____

6827 1107 0488

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	8/22/2016	1700	8/22/2016 1700
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 3.2 °C Bottles Received: 8 + TB

Date: 8-23-16 Time: 9W

Hold #

Condition: (lab use only) GOOD

COC Seal Intact: ✓Y ___N ___NA OK

pH Checked: <2 NCF:

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1855087
J135

Acctnum: SUNGES
Template: T114657
Prelogin: P564159
TSR: Mark Beasley
Cooler:
Shipped Via: Fed Ex

ESC
L·A·B S·C·I·E·N·C·E·S
YOUR LAB OF CHOICE

Cooler Receipt Checklist

Client: SUNGES SDG# L855087

Cooler Received/Opened On: 8-23-16 By Richard Hughes

Temperature Upon Receipt: 3.2 °c

(Signature)

Cooler Receipt Check List	Yes	No	N/A
Were custody seals on outside of cooler and intact?	✓		
Were custody papers properly filled out (ink, signed, etc.)?	✓		
Did all bottles arrive in good condition?	✓		
Were correct bottles used for the analyses requested?	✓		
Was sufficient amount of sample sent in each bottle?	✓		
Were correct preservatives used?	✓		
Were all applicable sample containers checked for preservation? (Any samples not in accepted pH range noted on COC .)	✓		
If applicable, was an observable VOA headspace present?		✓	
Non Conformance Generated? (If yes see attached NCF)		✓	

ANALYTICAL REPORT

August 30, 2016

GES, Inc - Sunoco

Sample Delivery Group:	L855090
Samples Received:	08/23/2016
Project Number:	NA
Description:	Pre-Construction Sampling
Site:	ME2
Report To:	Stephanie Grillo 440 Creamery Way, Ste 500 Exton, PA 19341

Entire Report Reviewed By:

Mark W. Beasley
Technical Service Representative

08222016-499-02 L855090-01 GW

Collected by: Zach P.
Collected date/time: 08/22/16 12:40
Received date/time: 08/23/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG901885	1	08/25/16 02:18	08/25/16 05:26	JM
Gravimetric Analysis by Method 2540 D-2011	WG901372	1	08/24/16 14:34	08/24/16 15:25	MMF
Metals (ICP) by Method 6010B	WG901411	1	08/24/16 10:22	08/25/16 02:21	LTB
Volatile Organic Compounds (GC) by Method RSK175	WG903014	1	08/29/16 09:25	08/29/16 09:25	MJ
Volatile Organic Compounds (GC/MS) by Method 8260B	WG902165	1	08/25/16 12:40	08/25/16 12:40	JAH
Wet Chemistry by Method 130.1	WG903312	5	08/29/16 22:36	08/29/16 22:36	ASK
Wet Chemistry by Method 2130 B-2011	WG901317	1	08/23/16 12:00	08/23/16 12:00	JJL
Wet Chemistry by Method 2320 B-2011	WG902219	1	08/29/16 08:50	08/29/16 08:50	MCG
Wet Chemistry by Method 9040C	WG901334	1	08/24/16 14:17	08/24/16 14:17	MHM
Wet Chemistry by Method 9050A	WG901341	1	08/23/16 14:02	08/23/16 14:02	AMC
Wet Chemistry by Method 9056A	WG901918	1	08/26/16 22:26	08/26/16 22:26	SAM

All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Technical Service Representative

Sample Handling and Receiving

The following samples were prepared and/or analyzed past recommended holding time. Concentrations should be considered minimum values.

ESC Sample ID	Project Sample ID	Method
L855090-01	08222016-499-02	9040C

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	339		10.0	1	08/25/2016 05:26	WG901885

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	ND		2.50	1	08/24/2016 15:25	WG901372

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness, Total (mg/L as CaCO3)	260		150	5	08/29/2016 22:36	WG903312

Wet Chemistry by Method 2130 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	NTU		NTU		date / time	
Turbidity	5.49		0.100	1	08/23/2016 12:00	WG901317

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	209		20.0	1	08/29/2016 08:50	WG902219

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.63		1	08/24/2016 14:17	WG901334

Sample Narrative:

9040C L855090-01 WG901334: 7.63 at 18.8c

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	umhos/cm			date / time	
Specific Conductance	541		1	08/23/2016 14:02	WG901341

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	08/26/2016 22:26	WG901918
Chloride	18.3		1.00	1	08/26/2016 22:26	WG901918
Sulfate	51.9		5.00	1	08/26/2016 22:26	WG901918

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.172		0.00500	1	08/25/2016 02:21	WG901411
Calcium	79.7		1.00	1	08/25/2016 02:21	WG901411
Iron	1.23		0.100	1	08/25/2016 02:21	WG901411
Magnesium	21.2		1.00	1	08/25/2016 02:21	WG901411
Manganese	0.176		0.0100	1	08/25/2016 02:21	WG901411
Potassium	1.59	B	1.00	1	08/25/2016 02:21	WG901411
Sodium	8.30		1.00	1	08/25/2016 02:21	WG901411

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	08/29/2016 09:25	WG903014
Ethane	ND		0.0130	1	08/29/2016 09:25	WG903014
Ethene	ND		0.0130	1	08/29/2016 09:25	WG903014
Propane	ND		0.0190	1	08/29/2016 09:25	WG903014

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	08/25/2016 12:40	WG902165
Toluene	ND		0.00500	1	08/25/2016 12:40	WG902165
Ethylbenzene	ND		0.00100	1	08/25/2016 12:40	WG902165
Total Xylenes	ND		0.00300	1	08/25/2016 12:40	WG902165
(S) Toluene-d8	*106*		*90.0-115*		*08/25/2016 12:40*	WG902165
(S) Dibromofluoromethane	*91.4*		*79.0-121*		*08/25/2016 12:40*	WG902165
(S) a,a,a-Trifluorotoluene	*98.9*		*90.4-116*		*08/25/2016 12:40*	WG902165
(S) 4-Bromofluorobenzene	*105*		*80.1-120*		*08/25/2016 12:40*	WG902165

Method Blank (MB)

(MB) R3159328-1 08/25/16 05:26

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L855023-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855023-01 08/25/16 05:26 • (DUP) R3159328-4 08/25/16 05:26

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	6560	6300	1	4.04		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159328-2 08/25/16 05:26 • (LCSD) R3159328-3 08/25/16 05:26

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Dissolved Solids	8800	8370	8430	95.1	95.8	85.0-115			0.714	5

Method Blank (MB)

(MB) R3159059-1 08/24/16 15:25

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Suspended Solids	U		0.350	2.50

L855079-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855079-01 08/24/16 15:25 • (DUP) R3159059-4 08/24/16 15:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	206	196	1	4.98		5

L855087-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855087-01 08/24/16 15:25 • (DUP) R3159059-5 08/24/16 15:25

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	360	361	1	0.370		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159059-2 08/24/16 15:25 • (LCSD) R3159059-3 08/24/16 15:25

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	792	764	102	98.8	85.0-115			3.60	5

Method Blank (MB)

(MB) R3160061-1 08/29/16 22:03

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hardness	3.68	J	1.43	30.0

L855031-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855031-01 08/29/16 22:14 • (DUP) R3160061-4 08/29/16 22:15

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness	184	184	1	0.000		20

L855355-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855355-01 08/29/16 22:25 • (DUP) R3160061-5 08/29/16 22:26

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness	191	190	1	1.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3160061-2 08/29/16 22:04 • (LCSD) R3160061-3 08/29/16 22:05

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hardness	150	160	159	107	106	85.0-115			1.00	20

L855512-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855512-01 08/29/16 22:27 • (MS) R3160061-6 08/29/16 22:28 • (MSD) R3160061-7 08/29/16 22:29

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hardness	100	60.3	154	154	94.0	94.0	1	80.0-120			0.000	20

Method Blank (MB)

(MB) WG901317-1 08/23/16 12:00

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	NTU		NTU	NTU
Turbidity	U		0.0310	0.100

L855065-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855065-01 08/23/16 12:00 • (DUP) WG901317-4 08/23/16 12:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	NTU	NTU		%		%
Turbidity	28.4	28.2	1	0.707		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG901317-2 08/23/16 12:00 • (LCSD) WG901317-3 08/23/16 12:00

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	NTU	NTU	NTU	%	%	%			%	%
Turbidity	40.0	43.4	42.8	109	107	90.0-110			1.39	20

Method Blank (MB)

(MB) R3159920-3 08/29/16 08:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Alkalinity	3.57	J	2.71	20.0

L855078-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855078-01 08/29/16 09:00 • (DUP) R3159920-4 08/29/16 09:09

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	138	113	1	20.0		20

L855267-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855267-01 08/29/16 12:34 • (DUP) R3159920-9 08/29/16 12:40

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	167	165	1	1.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159920-5 08/29/16 10:16 • (LCSD) R3159920-8 08/29/16 11:59

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Alkalinity	100	108	107	108	107	85.0-115			0.000	20

L855078-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855078-04 08/29/16 10:26 • (MS) R3159920-6 08/29/16 10:34 • (MSD) R3159920-7 08/29/16 10:46

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Alkalinity	100	219	291	280	72.0	61.0	1	80.0-120	J6	J6	4.00	20

L854944-01 Original Sample (OS) • Duplicate (DUP)

(OS) L854944-01 08/24/16 14:17 • (DUP) WG901334-3 08/24/16 14:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	9.03	9.06	1	0.332		1

L855162-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855162-01 08/24/16 14:17 • (DUP) WG901334-4 08/24/16 14:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	9.08	9.09	1	0.110		1

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG901334-1 08/24/16 14:17 • (LCSD) WG901334-2 08/24/16 14:17

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.11	6.07	6.08	99.3	99.5	98.4-102			0.165	1

Method Blank (MB)

(MB) WG901341-4 08/23/16 14:02

Analyte	MB Result umhos/cm	MB Qualifier	MB MDL umhos/cm	MB RDL umhos/cm
Specific Conductance	1.00			

L854879-01 Original Sample (OS) • Duplicate (DUP)

(OS) L854879-01 08/23/16 14:02 • (DUP) WG901341-1 08/23/16 14:02

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	664	666	1	0.301		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG901341-2 08/23/16 14:02 • (LCSD) WG901341-3 08/23/16 14:02

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCSD Result umhos/cm	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Specific Conductance	542	552	550	102	101	90.0-110			0.363	20

Method Blank (MB)

(MB) R3159693-1 08/26/16 17:38

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.079	1.00
Chloride	U		0.0519	1.00
Sulfate	U		0.0774	5.00

L855135-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855135-01 08/26/16 20:45 • (DUP) R3159693-4 08/26/16 20:59

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	0.0869	0.0960	1	10	J	15
Chloride	37.9	37.8	1	0		15
Sulfate	U	0.000	1	0		15

L855138-03 Original Sample (OS) • Duplicate (DUP)

(OS) L855138-03 08/27/16 00:07 • (DUP) R3159693-6 08/27/16 00:21

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.000	1	0		15
Chloride	7.58	7.39	1	2		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159693-2 08/26/16 17:52 • (LCSD) R3159693-3 08/26/16 18:06

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromide	40.0	40.5	40.3	101	101	80-120			0	15
Chloride	40.0	39.5	39.5	99	99	80-120			0	15
Sulfate	40.0	40.3	40.1	101	100	80-120			0	15

L855137-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L855137-01 08/26/16 21:14 • (MS) R3159693-5 08/26/16 21:28

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	U	48.1	96	1	80-120	
Chloride	50.0	27.7	77.4	99	1	80-120	
Sulfate	50.0	13.5	63.7	100	1	80-120	

L855138-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L855138-04 08/27/16 00:35 • (MS) R3159693-7 08/27/16 00:50 • (MSD) R3159693-8 08/27/16 01:04

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Bromide	50.0	ND	44.0	43.4	88	87	1	80-120			1	15
Chloride	50.0	6.85	56.9	57.2	100	101	1	80-120			1	15

Method Blank (MB)

(MB) R3159024-1 08/25/16 01:32

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.0017	0.00500
Calcium	U		0.0463	1.00
Iron	U		0.0141	0.100
Magnesium	0.0431	J	0.0111	1.00
Manganese	U		0.0012	0.0100
Potassium	0.182	J	0.102	1.00
Sodium	0.389	J	0.0985	1.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159024-2 08/25/16 01:35 • (LCSD) R3159024-3 08/25/16 01:37

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Barium	1.00	1.01	1.06	101	106	80-120			4	20
Calcium	10.0	10.6	10.9	106	109	80-120			3	20
Iron	10.0	9.79	10.2	98	102	80-120			4	20
Magnesium	10.0	10.5	10.8	105	108	80-120			3	20
Manganese	1.00	0.976	0.989	98	99	80-120			1	20
Potassium	10.0	9.75	10.1	98	101	80-120			4	20
Sodium	10.0	9.81	10.1	98	101	80-120			3	20

Method Blank (MB)

(MB) R3159861-1 08/29/16 09:10

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Methane	U		0.00291	0.0100
Ethane	U		0.00407	0.0130
Ethene	U		0.00426	0.0130
Propane	U		0.00548	0.0190

L855096-01 Original Sample (OS) • Duplicate (DUP)

(OS) L855096-01 08/29/16 09:27 • (DUP) R3159861-2 08/29/16 09:43

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	0.572	0.575	1	0.490		20
Ethane	ND	0.000	1	0.000		20
Ethene	ND	0.000	1	0.000		20
Propane	ND	0.000	1	0.000		20

L855220-02 Original Sample (OS) • Duplicate (DUP)

(OS) L855220-02 08/29/16 09:51 • (DUP) R3159861-3 08/29/16 10:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	U	0.000	1	0.000		20
Ethane	U	0.000	1	0.000		20
Ethene	U	0.000	1	0.000		20
Propane	U	0.000	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3159861-4 08/29/16 10:49 • (LCSD) R3159861-5 08/29/16 10:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Methane	0.0678	0.0664	0.0618	97.9	91.1	85.0-115			7.16	20
Ethane	0.129	0.121	0.122	93.4	94.6	85.0-115			1.19	20
Ethene	0.127	0.117	0.118	91.8	93.2	85.0-115			1.53	20
Propane	0.186	0.170	0.175	91.4	94.0	85.0-115			2.75	20

Method Blank (MB)

(MB) R3160243-3 08/25/16 10:40

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Benzene	U		0.000331	0.00100
Ethylbenzene	U		0.000384	0.00100
Toluene	U		0.000780	0.00500
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*106*			*90.0-115*
(S) Dibromofluoromethane	*90.0*			*79.0-121*
(S) a,a,a-Trifluorotoluene	*96.6*			*90.4-116*
(S) 4-Bromofluorobenzene	*104*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3160243-1 08/25/16 09:29 • (LCSD) R3160243-2 08/25/16 10:00

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Benzene	0.0250	0.0287	0.0256	115	102	73.0-122			11.3	20
Ethylbenzene	0.0250	0.0302	0.0282	121	113	80.9-121			6.92	20
Toluene	0.0250	0.0271	0.0238	108	95.0	77.9-116			13.2	20
Xylenes, Total	0.0750	0.0904	0.0851	121	113	79.2-122			6.07	20
(S) Toluene-d8				*102*	*99.8*	*90.0-115*				
(S) Dibromofluoromethane				*88.0*	*87.5*	*79.0-121*				
(S) a,a,a-Trifluorotoluene				*96.3*	*95.8*	*90.4-116*				
(S) 4-Bromofluorobenzene				*103*	*109*	*80.1-120*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

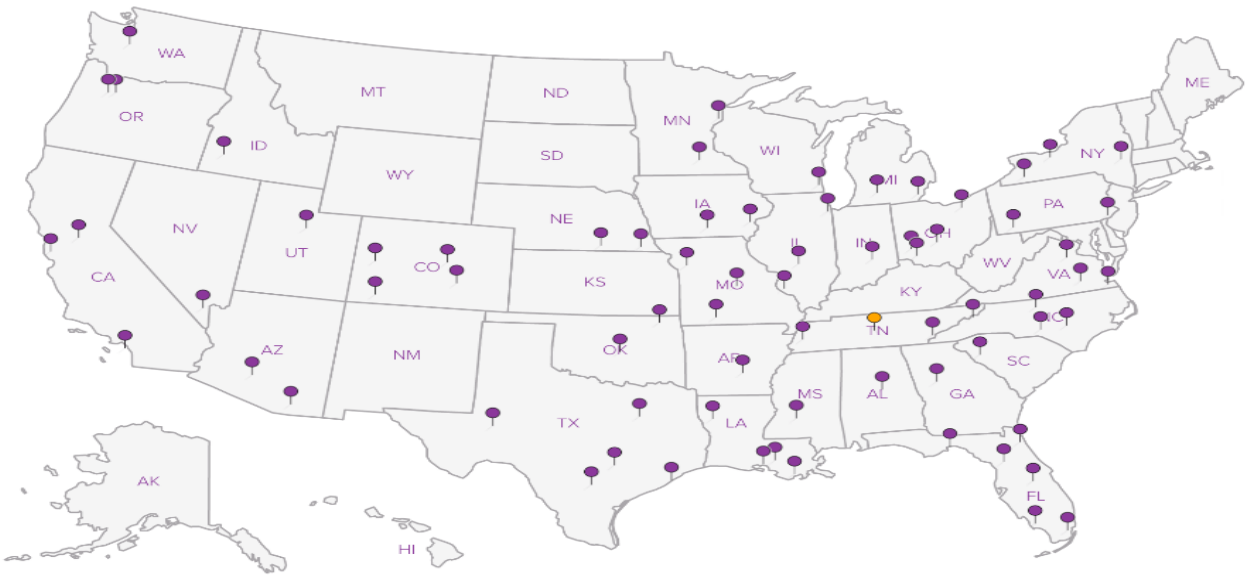
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Company Name/Address:
GES, Inc - Sunoco
440 Creamery Way, Suite 500
Exton, PA 19341

Billing Information:
Accounts Payable
440 Creamery Way, Suite 500
Exton, PA 19341

Report to: **Holly Smoker**

Email To: **hsmoker@gesonline.com**

Project Description: **Pre-Construction Sampling**

City/State Collected: Oaks, Norristown, PA

Phone: **610-458-1077**
Fax: **NA**

Client Project # **NA**

Lab Project # **SUNGES-GRILLO**

Collected by (print): Zack Pelletier

Site/Facility ID # **ME2**

P.O. # **NA**

Collected by (signature): Zack Pelletier

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	**pH,SPCON,TDS,TURB* 250mlHDPE-NoPres	ALK, Br, Cl, SO4 250mlHDPE-NoPres	Total Metals, Hardness 250mlHDPE-HNO3 <2	RSK175 + Propane 40mlAmb-HCl	TSS 1L-HDPE NoPres	VR260BTEX 40mlAmb-HCl					Rem./Contaminant	Sample # (lab only)
082220-16-488-02	Grab	GW		8/22/2016	1240	8	X	X	X	X	X	X						-01

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks: **Metals = Ba,Ca,Fe,K,Mg,Mn,Na**

pH _____ Temp _____

Flow _____ Other _____

6827 1107 0488

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Zack Pelletier	8/22/2016	1700	8/22/16 1700
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 3.2 °C Bottles Received: 8

Date: 8-23-16 Time: 9W

Hold #

Condition: (lab use only) OK

COC Seal Intact: ✓ Y ___N ___NA

pH Checked: <2 NCF:

Chain of Custody Page 1 of 1

ESC LAB SCIENCES

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L855090

J134

Acctnum: SUNGES
Template: T114657
Prelogin: P564159
TSR: Mark Beasley
Cooler:
Shipped Via: Fed Ex

ESC LAB SCIENCES

YOUR LAB OF CHOICE

Cooler Receipt Checklist

Client: SUNGES SDG# L855090

Cooler Received/Opened On: 8-23-16 By Richard Hughes

Temperature Upon Receipt: 3.2 °C

(Signature)

Cooler Receipt Check List	Yes	No	N/A
Were custody seals on outside of cooler and intact?	✓		
Were custody papers properly filled out (ink, signed, etc.)?	✓		
Did all bottles arrive in good condition?	✓		
Were correct bottles used for the analyses requested?	✓		
Was sufficient amount of sample sent in each bottle?	✓		
Were correct preservatives used?	✓		
Were all applicable sample containers checked for preservation? (Any samples not in accepted pH range noted on COC .)	✓		
If applicable, was an observable VOA headspace present?		✓	
Non Conformance Generated? (If yes see attached NCF)		✓	

ANALYTICAL REPORT

November 17, 2017

GES, Inc - Sunoco

Sample Delivery Group:	L950204
Samples Received:	11/11/2017
Project Number:	0204729-06-160-XX
Description:	Pre-Construction Sampling

Report To: Holly Smoker
440 Creamery Way, Ste 500
Exton, PA 19341

Entire Report Reviewed By:

Mark W. Beasley
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

11102017-614-02 L950204-01 GW

Collected by	Collected date/time	Received date/time
Jackie Burke	11/10/17 13:10	11/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Microbiology by Method 9222D	WG1041821	1	11/11/17 16:02	11/11/17 16:02	KMR
Microbiology by Method 9223 B-1997	WG1041819	1	11/11/17 16:00	11/11/17 16:00	MH
Gravimetric Analysis by Method 2540 C-2011	WG1042646	1	11/15/17 21:57	11/15/17 22:19	BS
Gravimetric Analysis by Method 2540 D-2011	WG1042650	1	11/14/17 22:33	11/14/17 23:10	BS
Wet Chemistry by Method 130.1	WG1043014	1	11/16/17 16:01	11/16/17 16:01	JER
Wet Chemistry by Method 2130 B-2011	WG1041782	1	11/11/17 18:04	11/11/17 18:04	GB
Wet Chemistry by Method 2320 B-2011	WG1042043	1	11/14/17 12:15	11/14/17 12:15	MCG
Wet Chemistry by Method 9040C	WG1042177	1	11/14/17 09:51	11/14/17 09:51	ER
Wet Chemistry by Method 9050A	WG1043753	1	11/16/17 16:57	11/16/17 16:57	MA
Wet Chemistry by Method 9056A	WG1041699	1	11/13/17 11:40	11/13/17 11:40	DR
Metals (ICP) by Method 6010B	WG1042029	1	11/14/17 08:49	11/14/17 22:53	CCE
Volatile Organic Compounds (GC) by Method RSK175	WG1042257	1	11/14/17 10:07	11/14/17 10:07	BG
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1041922	1	11/13/17 06:49	11/13/17 06:49	ACG

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Technical Service Representative

Sample Narrative

FC test was confirmed to be positive for both fecal coliform and E. coli. BE 11-16-17

Microbiology by Method 9222D

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	col/100ml			date / time	
Coliform,fecal	10.0		1	11/11/2017 16:02	WG1041821

Microbiology by Method 9223 B-1997

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	MPN/100ml			date / time	
E.Coli	25.3		1	11/11/2017 16:00	WG1041819
Coliform,Total	>2419.6		1	11/11/2017 16:00	WG1041819

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	455		10.0	1	11/15/2017 22:19	WG1042646

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	4.11		2.50	1	11/14/2017 23:10	WG1042650

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	200		30.0	1	11/16/2017 16:01	WG1043014

Wet Chemistry by Method 2130 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	NTU		NTU		date / time	
Turbidity	1.01		0.300	1	11/11/2017 18:04	WG1041782

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	114		20.0	1	11/14/2017 12:15	WG1042043

Sample Narrative:

L950204-01 WG1042043: Endpoint pH 4.5

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.91	T8	1	11/14/2017 09:51	WG1042177

Sample Narrative:

L950204-01 WG1042177: 6.91 at 18.3C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	umhos/cm		umhos/cm		date / time	
Specific Conductance	528		10.0	1	11/16/2017 16:57	WG1043753

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	11/13/2017 11:40	WG1041699
Chloride	22.7		1.00	1	11/13/2017 11:40	WG1041699
Sulfate	41.9		5.00	1	11/13/2017 11:40	WG1041699

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0835		0.00500	1	11/14/2017 22:53	WG1042029
Calcium	80.6		1.00	1	11/14/2017 22:53	WG1042029
Iron	ND		0.100	1	11/14/2017 22:53	WG1042029
Magnesium	9.92		1.00	1	11/14/2017 22:53	WG1042029
Manganese	ND		0.0100	1	11/14/2017 22:53	WG1042029
Potassium	4.07		1.00	1	11/14/2017 22:53	WG1042029
Sodium	7.63		1.00	1	11/14/2017 22:53	WG1042029

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	11/14/2017 10:07	WG1042257
Ethane	ND		0.0130	1	11/14/2017 10:07	WG1042257
Ethene	ND		0.0130	1	11/14/2017 10:07	WG1042257
Propane	ND		0.0190	1	11/14/2017 10:07	WG1042257

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	11/13/2017 06:49	WG1041922
Toluene	ND		0.00100	1	11/13/2017 06:49	WG1041922
Ethylbenzene	ND		0.00100	1	11/13/2017 06:49	WG1041922
Total Xylenes	ND		0.00300	1	11/13/2017 06:49	WG1041922
(S) Toluene-d8	*101*		*80.0-120*		*11/13/2017 06:49*	WG1041922
(S) Dibromofluoromethane	*95.8*		*76.0-123*		*11/13/2017 06:49*	WG1041922
(S) a,a,a-Trifluorotoluene	*109*		*80.0-120*		*11/13/2017 06:49*	WG1041922
(S) 4-Bromofluorobenzene	*101*		*80.0-120*		*11/13/2017 06:49*	WG1041922

Method Blank (MB)

(MB) R3266345-1 11/15/17 22:19

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Dissolved Solids	U		2.82	10.0

L950163-08 Original Sample (OS) • Duplicate (DUP)

(OS) L950163-08 11/15/17 22:19 • (DUP) R3266345-4 11/15/17 22:19

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Dissolved Solids	366	349	1	4.76		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3266345-2 11/15/17 22:19 • (LCSD) R3266345-3 11/15/17 22:19

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Dissolved Solids	8800	8910	8650	101	98.3	85.0-115			2.96	5

Method Blank (MB)

(MB) R3265905-1 11/14/17 23:10

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Suspended Solids	U		0.350	2.50

L950208-01 Original Sample (OS) • Duplicate (DUP)

(OS) L950208-01 11/14/17 23:10 • (DUP) R3265905-4 11/14/17 23:10

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	7.00	7.50	1	6.90	P1	5

L950211-01 Original Sample (OS) • Duplicate (DUP)

(OS) L950211-01 11/14/17 23:10 • (DUP) R3265905-5 11/14/17 23:10

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Suspended Solids	39.3	40.8	1	3.75		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3265905-2 11/14/17 23:10 • (LCSD) R3265905-3 11/14/17 23:10

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Suspended Solids	773	856	884	111	114	85.0-115			3.22	5

Method Blank (MB)

(MB) R3266269-1 11/16/17 15:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hardness (colorimetric) as CaCO3	4.74	J	1.43	30.0

L950185-01 Original Sample (OS) • Duplicate (DUP)

(OS) L950185-01 11/16/17 15:56 • (DUP) R3266269-4 11/16/17 15:57

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness (colorimetric) as CaCO3	54.3	56.0	1	3		20

L950240-03 Original Sample (OS) • Duplicate (DUP)

(OS) L950240-03 11/16/17 16:16 • (DUP) R3266269-5 11/16/17 16:17

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness (colorimetric) as CaCO3	61.8	62.3	1	1		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3266269-2 11/16/17 15:54 • (LCSD) R3266269-3 11/16/17 15:55

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hardness (colorimetric) as CaCO3	150	144	149	96	99	85-115			3	20

L950240-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L950240-04 11/16/17 16:17 • (MS) R3266269-6 11/16/17 16:18 • (MSD) R3266269-7 11/16/17 16:19

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Hardness (colorimetric) as CaCO3	150	49.1	181	185	88	91	1	80-120			2	20

Method Blank (MB)

(MB) R3264891-1 11/11/17 18:04

Analyte	MB Result NTU	MB Qualifier	MB MDL NTU	MB RDL NTU
Turbidity	0.0690	J	0.0310	0.300

L950203-01 Original Sample (OS) • Duplicate (DUP)

(OS) L950203-01 11/11/17 18:04 • (DUP) R3264891-4 11/11/17 18:04

Analyte	Original Result NTU	DUP Result NTU	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Turbidity	0.750	0.753	1	0.000		20

L950232-01 Original Sample (OS) • Duplicate (DUP)

(OS) L950232-01 11/11/17 18:04 • (DUP) R3264891-5 11/11/17 18:04

Analyte	Original Result NTU	DUP Result NTU	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Turbidity	2.07	2.11	1	2.00		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3264891-2 11/11/17 18:04 • (LCSD) R3264891-3 11/11/17 18:04

Analyte	Spike Amount NTU	LCS Result NTU	LCSD Result NTU	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Turbidity	40.0	41.4	41.4	104	104	90.0-110			0.000	20

L949986-01 Original Sample (OS) • Duplicate (DUP)

(OS) L949986-01 11/14/17 09:31 • (DUP) R3265451-2 11/14/17 09:41

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	4500	4500	2.5	0.000		20

Sample Narrative:
OS: Endpoint pH 4.5
DUP: Endpoint pH 4.5

L950213-01 Original Sample (OS) • Duplicate (DUP)

(OS) L950213-01 11/14/17 13:33 • (DUP) R3265451-7 11/14/17 13:40

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	52.7	47.3	1	11.0		20

Sample Narrative:
OS: Endpoint pH 4.5
DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3265451-3 11/14/17 11:07 • (LCSD) R3265451-6 11/14/17 12:42

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Alkalinity	100	109	99.7	109	100	85.0-115			9.00	20

Sample Narrative:
LCS: Endpoint pH 4.5
LCSD: Endpoint pH 4.5

L949499-01 Original Sample (OS) • Duplicate (DUP)

(OS) L949499-01 11/14/17 09:51 • (DUP) R3265368-3 11/14/17 09:51

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	6.60	6.60	1	0.000		1

Sample Narrative:

OS: 6.6 at 12.1C

DUP: 6.6 at 12C

L950232-01 Original Sample (OS) • Duplicate (DUP)

(OS) L950232-01 11/14/17 09:51 • (DUP) R3265368-4 11/14/17 09:51

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	6.13	6.14	1	0.163		1

Sample Narrative:

OS: 6.13 at 18.6C

DUP: 6.14 at 18.7C

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3265368-1 11/14/17 09:51 • (LCSD) R3265368-2 11/14/17 09:51

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	5.96	6.01	5.98	101	100	98.3-102			0.500	1

Sample Narrative:

LCS: 6.01 at 18.9C

LCSD: 5.98 at 18.8C

Method Blank (MB)

(MB) WG1043753-1 11/16/17 16:57

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	umhos/cm		umhos/cm	umhos/cm
Specific Conductance	U		10.0	10.0

L950203-01 Original Sample (OS) • Duplicate (DUP)

(OS) L950203-01 11/16/17 16:57 • (DUP) WG1043753-4 11/16/17 16:57

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	664	664	1	0.000		20

L950373-02 Original Sample (OS) • Duplicate (DUP)

(OS) L950373-02 11/16/17 16:57 • (DUP) WG1043753-5 11/16/17 16:57

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	3350	3350	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG1043753-2 11/16/17 16:57 • (LCSD) WG1043753-3 11/16/17 16:57

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	umhos/cm	umhos/cm	umhos/cm	%	%	%			%	%
Specific Conductance	559	554	554	99.1	99.1	85.0-115			0.000	20

Method Blank (MB)

(MB) R3265237-1 11/13/17 09:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.079	1.00
Chloride	U		0.0519	1.00
Sulfate	U		0.0774	5.00

L950205-01 Original Sample (OS) • Duplicate (DUP)

(OS) L950205-01 11/13/17 11:54 • (DUP) R3265237-4 11/13/17 12:07

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.000	1	0		15
Chloride	16.8	16.8	1	0		15
Sulfate	19.9	19.8	1	0		15

L950216-01 Original Sample (OS) • Duplicate (DUP)

(OS) L950216-01 11/13/17 15:55 • (DUP) R3265237-7 11/13/17 16:08

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.104	1	4	J	15
Chloride	23.1	23.4	1	1		15
Sulfate	21.9	21.9	1	0		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3265237-2 11/13/17 09:53 • (LCSD) R3265237-3 11/13/17 10:06

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromide	40.0	40.0	40.0	100	100	80-120			0	15
Chloride	40.0	39.6	39.5	99	99	80-120			0	15
Sulfate	40.0	39.9	39.7	100	99	80-120			0	15

L950205-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L950205-01 11/13/17 11:54 • (MS) R3265237-5 11/13/17 12:47 • (MSD) R3265237-6 11/13/17 13:01

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Bromide	50.0	ND	47.1	48.0	94	96	1	80-120			2	15
Chloride	50.0	16.8	66.9	67.2	100	101	1	80-120			1	15
Sulfate	50.0	19.9	69.7	70.0	100	100	1	80-120			0	15

L950216-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L950216-01 11/13/17 15:55 • (MS) R3265237-8 11/13/17 16:22

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	ND	49.6	99	1	80-120	
Chloride	50.0	23.1	73.1	100	1	80-120	
Sulfate	50.0	21.9	72.2	101	1	80-120	

Method Blank (MB)

(MB) R3265605-1 11/14/17 21:31

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.0017	0.00500
Calcium	U		0.0463	1.00
Iron	U		0.0141	0.100
Magnesium	U		0.0111	1.00
Manganese	U		0.0012	0.0100
Potassium	0.228	J	0.102	1.00
Sodium	0.201	J	0.0985	1.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3265605-2 11/14/17 21:34 • (LCSD) R3265605-3 11/14/17 21:37

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Barium	1.00	0.989	0.996	99	100	80-120			1	20
Calcium	10.0	9.66	9.74	97	97	80-120			1	20
Iron	10.0	9.65	9.72	96	97	80-120			1	20
Magnesium	10.0	9.99	10.1	100	101	80-120			1	20
Manganese	1.00	0.930	0.936	93	94	80-120			1	20
Potassium	10.0	9.73	9.79	97	98	80-120			1	20
Sodium	10.0	9.67	9.73	97	97	80-120			1	20

L950039-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L950039-01 11/14/17 21:40 • (MS) R3265605-5 11/14/17 21:46 • (MSD) R3265605-6 11/14/17 21:50

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	1.00	0.325	1.28	1.28	95	96	1	75-125			0	20
Calcium	10.0	105	113	113	76	78	1	75-125			0	20
Iron	10.0	2.43	11.9	12.0	95	96	1	75-125			1	20
Magnesium	10.0	49.5	57.8	58.1	83	86	1	75-125			0	20
Manganese	1.00	2.80	3.62	3.64	82	84	1	75-125			0	20
Potassium	10.0	ND	10.0	10.1	95	96	1	75-125			1	20
Sodium	10.0	72.4	80.0	80.0	76	76	1	75-125			0	20

Method Blank (MB)

(MB) R3265389-1 11/14/17 08:12

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Methane	U		0.00291	0.0100
Ethane	U		0.00407	0.0130
Ethene	U		0.00426	0.0130
Propane	U		0.00548	0.0190

L949816-01 Original Sample (OS) • Duplicate (DUP)

(OS) L949816-01 11/14/17 09:11 • (DUP) R3265389-2 11/14/17 09:44

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	ND	0.000	1	0.000		20
Ethane	ND	0.000	1	0.000		20
Ethene	ND	0.000	1	0.000		20
Propane	ND	0.000	1	0.000		20

L950205-01 Original Sample (OS) • Duplicate (DUP)

(OS) L950205-01 11/14/17 10:09 • (DUP) R3265389-3 11/14/17 10:55

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	ND	0.000	1	0.000		20
Ethane	ND	0.000	1	0.000		20
Ethene	ND	0.000	1	0.000		20
Propane	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3265389-4 11/14/17 10:59 • (LCSD) R3265389-5 11/14/17 11:03

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Methane	0.0678	0.0742	0.0760	110	112	85.0-115			2.30	20
Ethane	0.129	0.116	0.117	89.7	90.5	85.0-115			0.896	20
Ethene	0.127	0.118	0.119	93.2	93.6	85.0-115			0.428	20
Propane	0.186	0.189	0.192	102	103	85.0-115			1.29	20

Method Blank (MB)

(MB) R3265047-2 11/12/17 22:44

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000331	0.00100
Ethylbenzene	U		0.000384	0.00100
Toluene	U		0.000412	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*103*			*80.0-120*
(S) Dibromofluoromethane	*93.0*			*76.0-123*
(S) a,a,a-Trifluorotoluene	*108*			*80.0-120*
(S) 4-Bromofluorobenzene	*101*			*80.0-120*

Laboratory Control Sample (LCS)

(LCS) R3265047-1 11/12/17 21:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.0250	0.0256	103	69.0-123	
Ethylbenzene	0.0250	0.0250	100	77.0-120	
Toluene	0.0250	0.0250	99.9	77.0-120	
Xylenes, Total	0.0750	0.0770	103	77.0-120	
(S) Toluene-d8			*96.9*	*80.0-120*	
(S) Dibromofluoromethane			*94.2*	*76.0-123*	
(S) a,a,a-Trifluorotoluene			*108*	*80.0-120*	
(S) 4-Bromofluorobenzene			*99.0*	*80.0-120*	

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660
Alaska	UST-080
Arizona	AZ0612
Arkansas	88-0469
California	01157CA
Colorado	TN00003
Conneticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia [1]	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
Iowa	364
Kansas	E-10277
Kentucky [1]	90010
Kentucky [2]	16
Louisiana	AI30792
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086
Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico	TN00003
New York	11742
North Carolina	Env375
North Carolina [1]	DW21704
North Carolina [2]	41
North Dakota	R-140
Ohio–VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	221
South Carolina	84004
South Dakota	n/a
Tennessee [1 4]	2006
Texas	T 104704245-07-TX
Texas [5]	LAB0152
Utah	6157585858
Vermont	VT2006
Virginia	109
Washington	C1915
West Virginia	233
Wisconsin	9980939910
Wyoming	A2LA

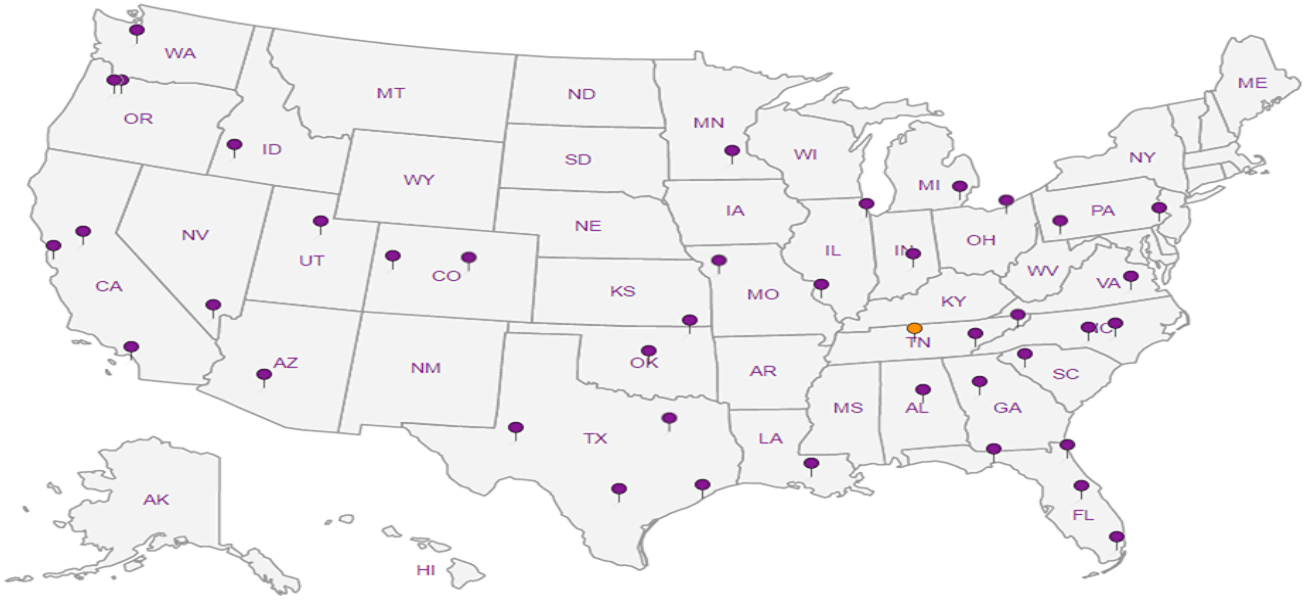
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01
A2LA – ISO 17025 [5]	1461.02
Canada	1461.01
EPA–Crypto	TN00003
AIHA-LAP,LLC	100789
DOD	1461.01
USDA	S-67674

[1.] Drinking Water [2.] Underground Storage Tanks [3.] Aquatic Toxicity [4.] Chemical/Microbiological [5.] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



GES, Inc. - Sunoco

440 Creamery Way, Suite 500
Exton, PA 19341

Billing Information:
Accounts Payable
440 Creamery Way, Suite 500
Exton, PA 19341

Pres Chk

Report to: **Holly Smoker**

Email To: **sgrillo@gesonline.com, hsmoker@geso**

Project Description: **Pre-Construction Sampling**

City/State Collected: West Nanticoke, PA

Phone: **406-578-4501**
Fax:

Client Project # Q204729 **-06-160-XX**

Lab Project # **SUNGES-GRILLO**

Collected by (print): Jackie Burke

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: **Standard TAT**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	**pH,SPCON,TDS,TURB* 250ml plastic NP	ALK, Br, Cl, SO4 250ml plastic NP	Total Mtls, Hardness 250ml plastic HNO3	RSK175 + Propane 40ml vial w/ HCL	TSS 1L plastic NP	V8260BTEX 40ml vial w/ HCL	****DW COLILERT**** microbiological	****DW Fecal**** microbiological	Remarks	Sample # (lab only)
11102017-GW-02	Grab	DW	—	11-10-17	1310	8	X	X	X	X	X	X	X	X		01

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ___

Remarks:
Metals = Ba,Ca,Fe,K,Mg,Mn,Na
******Log COLILERT & FC as DW matrix******

pH ___ Temp ___
Flow ___ Other ___

Samples returned via:
__ UPS ✓ FedEx __ Courier __ ___

Tracking # 7474 0939 9466

Trip Blank Received: Yes / No
HCL / MeoH
TBR

	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	11-10-17	1455	Fedex 11-10-17 1455
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Temp: 2.4° °C Bottles Received: 8
Date: 11/11/17 Time: 0845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # 950204
Table # C202
Acctnum: SUNGES
Template: T126128
Prelogin: P611030
TSR: 134 - Mark Beasley
PB:
Shipped Via: Fedex

ANALYTICAL REPORT

January 08, 2018

GES, Inc - Sunoco

Sample Delivery Group:	L960221
Samples Received:	12/29/2017
Project Number:	0204729-06-160-XX
Description:	Pre-Construction Sampling

Report To: Stephanie Grillo
440 Creamery Way, Ste 500
Exton, PA 19341

Entire Report Reviewed By:

Olivia Studebaker
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

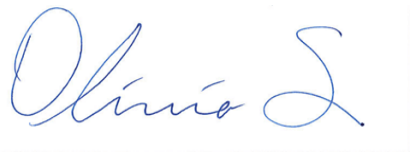
TABLE OF CONTENTS

12282017-639-01 L960221-01 GW

Collected by: Alison Emmons
Collected date/time: 12/28/17 16:10
Received date/time: 12/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Microbiology by Method 9222D	WG1058414	1	12/29/17 12:00	12/29/17 12:00	MH
Microbiology by Method 9223 B-1997	WG1058411	1	12/29/17 11:33	12/29/17 11:33	MH
Gravimetric Analysis by Method 2540 C-2011	WG1058790	1	01/02/18 09:48	01/02/18 10:31	BS
Gravimetric Analysis by Method 2540 D-2011	WG1058772	1	12/31/17 11:05	12/31/17 11:47	BS
Wet Chemistry by Method 130.1	WG1058897	5	01/02/18 15:33	01/02/18 15:33	KK
Wet Chemistry by Method 2130 B-2011	WG1058421	1	12/29/17 14:05	12/29/17 14:05	ER
Wet Chemistry by Method 2320 B-2011	WG1059873	1	01/05/18 15:22	01/05/18 15:22	CSU
Wet Chemistry by Method 9040C	WG1058456	1	12/30/17 15:38	12/30/17 15:38	ER
Wet Chemistry by Method 9050A	WG1058866	1	01/02/18 11:09	01/02/18 11:09	TH
Wet Chemistry by Method 9056A	WG1058429	1	12/29/17 16:29	12/29/17 16:29	MAJ
Metals (ICP) by Method 6010B	WG1058389	1	12/30/17 10:58	01/02/18 00:37	JDG
Volatile Organic Compounds (GC) by Method RSK175	WG1059446	1	01/04/18 10:18	01/04/18 10:18	BG
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1058289	1	12/29/17 17:20	12/29/17 17:20	JAH

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Olivia Studebaker
Technical Service Representative

Microbiology by Method 9222D

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	col/100ml			date / time	
Coliform,fecal	<1		1	12/29/2017 12:00	WG1058414

Microbiology by Method 9223 B-1997

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	MPN/100ml			date / time	
E.Coli	<1		1	12/29/2017 11:33	WG1058411
Coliform,Total	4.10	P1	1	12/29/2017 11:33	WG1058411

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	535		10.0	1	01/02/2018 10:31	WG1058790

Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Suspended Solids	4.00		2.50	1	12/31/2017 11:47	WG1058772

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	472		150	5	01/02/2018 15:33	WG1058897

Wet Chemistry by Method 2130 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	NTU		NTU		date / time	
Turbidity	3.49		0.300	1	12/29/2017 14:05	WG1058421

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	303		20.0	1	01/05/2018 15:22	WG1059873

Sample Narrative:

L960221-01 WG1059873: Endpoint pH 4.5

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.22	T8	1	12/30/2017 15:38	WG1058456

Sample Narrative:

L960221-01 WG1058456: 7.22 at 17.7C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	umhos/cm		umhos/cm		date / time	
Specific Conductance	904		10.0	1	01/02/2018 11:09	WG1058866

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	12/29/2017 16:29	WG1058429
Chloride	64.6		1.00	1	12/29/2017 16:29	WG1058429
Sulfate	74.6		5.00	1	12/29/2017 16:29	WG1058429

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.0421		0.00500	1	01/02/2018 00:37	WG1058389
Calcium	115		1.00	1	01/02/2018 00:37	WG1058389
Iron	0.693		0.100	1	01/02/2018 00:37	WG1058389
Magnesium	37.5		1.00	1	01/02/2018 00:37	WG1058389
Manganese	0.0769		0.0100	1	01/02/2018 00:37	WG1058389
Potassium	1.81		1.00	1	01/02/2018 00:37	WG1058389
Sodium	15.5		1.00	1	01/02/2018 00:37	WG1058389

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	ND		0.0100	1	01/04/2018 10:18	WG1059446
Ethane	ND		0.0130	1	01/04/2018 10:18	WG1059446
Ethene	ND		0.0130	1	01/04/2018 10:18	WG1059446
Propane	ND		0.0190	1	01/04/2018 10:18	WG1059446

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	12/29/2017 17:20	WG1058289
Toluene	ND		0.00100	1	12/29/2017 17:20	WG1058289
Ethylbenzene	ND		0.00100	1	12/29/2017 17:20	WG1058289
Total Xylenes	ND		0.00300	1	12/29/2017 17:20	WG1058289
(S) Toluene-d8	*105*		*80.0-120*		*12/29/2017 17:20*	WG1058289
(S) Dibromofluoromethane	*90.8*		*76.0-123*		*12/29/2017 17:20*	WG1058289
(S) a,a,a-Trifluorotoluene	*109*		*80.0-120*		*12/29/2017 17:20*	WG1058289
(S) 4-Bromofluorobenzene	*99.8*		*80.0-120*		*12/29/2017 17:20*	WG1058289

Method Blank (MB)

(MB) R3277290-1 01/02/18 10:31

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Dissolved Solids	U		2.82	10.0

L960306-01 Original Sample (OS) • Duplicate (DUP)

(OS) L960306-01 01/02/18 10:31 • (DUP) R3277290-4 01/02/18 10:31

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Dissolved Solids	383	360	1	6.10	J3	5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3277290-2 01/02/18 10:31 • (LCSD) R3277290-3 01/02/18 10:31

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Dissolved Solids	8800	8300	8550	94.3	97.2	85.0-115			2.97	5

Method Blank (MB)

(MB) R3276892-1 12/31/17 11:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Suspended Solids	U		0.350	2.50

L960203-01 Original Sample (OS) • Duplicate (DUP)

(OS) L960203-01 12/31/17 11:47 • (DUP) R3276892-4 12/31/17 11:47

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Suspended Solids	22.0	23.0	1	4.44		5

Sample Narrative:

OS: Only 100mLs would filter for TSS.

L960304-02 Original Sample (OS) • Duplicate (DUP)

(OS) L960304-02 12/31/17 11:47 • (DUP) R3276892-5 12/31/17 11:47

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Suspended Solids	58.3	58.3	1	0.000		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3276892-2 12/31/17 11:47 • (LCSD) R3276892-3 12/31/17 11:47

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Suspended Solids	773	800	820	103	106	85.0-115			2.47	5

Method Blank (MB)

(MB) R3277030-1 01/02/18 15:09

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hardness (colorimetric) as CaCO3	4.25	J	1.43	30.0

L959929-01 Original Sample (OS) • Duplicate (DUP)

(OS) L959929-01 01/02/18 15:14 • (DUP) R3277030-4 01/02/18 15:15

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness (colorimetric) as CaCO3	63.1	61.4	1	2.73		20

L960606-01 Original Sample (OS) • Duplicate (DUP)

(OS) L960606-01 01/02/18 15:30 • (DUP) R3277030-7 01/02/18 15:30

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Hardness (colorimetric) as CaCO3	61.2	60.5	1	1.15		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3277030-2 01/02/18 15:10 • (LCSD) R3277030-3 01/02/18 15:11

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Hardness (colorimetric) as CaCO3	150	155	153	103	102	85-115			1.3	20

Method Blank (MB)

(MB) R3276620-1 12/29/17 14:05

Analyte	MB Result NTU	MB Qualifier	MB MDL NTU	MB RDL NTU
Turbidity	0.0470	J	0.0310	0.300

L960221-01 Original Sample (OS) • Duplicate (DUP)

(OS) L960221-01 12/29/17 14:05 • (DUP) R3276620-4 12/29/17 14:05

Analyte	Original Result NTU	DUP Result NTU	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Turbidity	3.49	3.50	1	0.286		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3276620-2 12/29/17 14:05 • (LCSD) R3276620-3 12/29/17 14:05

Analyte	Spike Amount NTU	LCS Result NTU	LCSD Result NTU	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Turbidity	40.0	43.3	43.4	108	109	90.0-110			0.231	20

L960045-01 Original Sample (OS) • Duplicate (DUP)

(OS) L960045-01 01/05/18 11:01 • (DUP) R3277738-1 01/05/18 11:09

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	540	486	1	10.5		20

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3277738-2 01/05/18 11:53 • (LCSD) R3277738-3 01/05/18 16:25

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Alkalinity	100	104	109	104	109	85.0-115			4.52	20

Sample Narrative:

LCS: Endpoint pH 4.5

LCSD: Endpoint pH 4.5

L960137-01 Original Sample (OS) • Duplicate (DUP)

(OS) L960137-01 12/30/17 15:38 • (DUP) R3276768-3 12/30/17 15:38

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.85	7.89	1	0.508		1

Sample Narrative:

OS: 7.85 at 8.5C

DUP: 7.89 at 8.5C

L960581-03 Original Sample (OS) • Duplicate (DUP)

(OS) L960581-03 12/30/17 15:38 • (DUP) R3276768-4 12/30/17 15:38

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.01	8.06	1	0.622		1

Sample Narrative:

OS: 8.01 at 17.4C

DUP: 8.06 at 17.5C

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3276768-1 12/30/17 15:38 • (LCSD) R3276768-2 12/30/17 15:38

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	6.38	6.29	6.29	98.6	98.6	98.4-102			0.000	1

Sample Narrative:

LCS: 6.29 at 19.9C

LCSD: 6.29 at 19.7C

Method Blank (MB)

(MB) WG1058866-1 01/02/18 11:09

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	umhos/cm		umhos/cm	umhos/cm
Specific Conductance	U		10.0	10.0

L960221-01 Original Sample (OS) • Duplicate (DUP)

(OS) L960221-01 01/02/18 11:09 • (DUP) WG1058866-4 01/02/18 11:09

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	904	901	1	0.332		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) WG1058866-2 01/02/18 11:09 • (LCSD) WG1058866-3 01/02/18 11:09

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	umhos/cm	umhos/cm	umhos/cm	%	%	%			%	%
Specific Conductance	559	551	552	98.6	98.7	85.0-115			0.181	20

Method Blank (MB)

(MB) R3276736-1 12/29/17 07:04

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.079	1.00
Chloride	U		0.0519	1.00
Sulfate	U		0.0774	5.00

L960280-15 Original Sample (OS) • Duplicate (DUP)

(OS) L960280-15 12/29/17 17:27 • (DUP) R3276736-4 12/29/17 17:41

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	U	0.000	1	0		15
Chloride	14.0	13.5	1	4.19		15
Sulfate	1.11	1.33	1	17.8	J P1	15

L960373-02 Original Sample (OS) • Duplicate (DUP)

(OS) L960373-02 12/29/17 20:34 • (DUP) R3276736-7 12/29/17 20:48

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.000	1	0		15
Chloride	2.12	1.86	1	13.2		15
Sulfate	26.9	11.5	1	80.1	J3	15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3276736-2 12/29/17 07:19 • (LCSD) R3276736-3 12/29/17 07:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromide	40.0	39.5	39.5	98.7	98.8	80-120			0.106	15
Chloride	40.0	39.3	39.3	98.2	98.4	80-120			0.212	15
Sulfate	40.0	39.7	39.7	99.2	99.3	80-120			0.093	15

L960280-15 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L960280-15 12/29/17 17:27 • (MS) R3276736-5 12/29/17 17:55 • (MSD) R3276736-6 12/29/17 18:39

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Bromide	50.0	U	49.1	50.6	98.3	101	1	80-120			3.01	15
Chloride	50.0	14.0	64.7	63.7	101	99.4	1	80-120			1.49	15
Sulfate	50.0	1.11	52.4	52.6	103	103	1	80-120			0.35	15

Method Blank (MB)

(MB) R3276872-7 01/02/18 00:14

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.0017	0.00500
Calcium	U		0.0463	1.00
Iron	U		0.0141	0.100
Magnesium	U		0.0111	1.00
Manganese	U		0.0012	0.0100
Potassium	U		0.102	1.00
Sodium	0.227	J	0.0985	1.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3276872-8 01/02/18 00:17 • (LCSD) R3276872-9 01/02/18 00:20

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Barium	1.00	0.961	0.958	96.1	95.8	80-120			0.25	20
Calcium	10.0	9.39	9.34	93.9	93.4	80-120			0.488	20
Iron	10.0	9.45	9.42	94.5	94.2	80-120			0.332	20
Magnesium	10.0	9.88	9.80	98.8	98	80-120			0.821	20
Manganese	1.00	0.927	0.925	92.7	92.5	80-120			0.219	20
Potassium	10.0	9.74	9.73	97.4	97.3	80-120			0.185	20
Sodium	10.0	9.30	9.29	93	92.9	80-120			0.0816	20

L960378-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L960378-01 01/02/18 00:24 • (MS) R3276872-11 01/02/18 00:30 • (MSD) R3276872-12 01/02/18 00:33

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	1.00	0.116	1.07	1.06	95	94	1	75-125			1.01	20
Calcium	10.0	15.3	25.7	25.7	104	103	1	75-125			0.204	20
Iron	10.0	0.955	10.3	10.3	93.6	93.3	1	75-125			0.34	20
Magnesium	10.0	ND	10.4	10.3	97.3	96.3	1	75-125			0.946	20
Manganese	1.00	0.0572	0.977	0.960	92	90.3	1	75-125			1.75	20
Potassium	10.0	5.46	14.7	14.6	92.5	91.9	1	75-125			0.395	20
Sodium	10.0	4.09	13.0	13.0	89	88.8	1	75-125			0.212	20

Method Blank (MB)

(MB) R3277438-1 01/04/18 08:52

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Methane	U		0.00291	0.0100
Ethane	U		0.00407	0.0130
Ethene	U		0.00426	0.0130
Propane	U		0.00548	0.0190

L960221-01 Original Sample (OS) • Duplicate (DUP)

(OS) L960221-01 01/04/18 10:18 • (DUP) R3277438-2 01/04/18 10:53

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Methane	ND	0.000	1	0.000		20
Ethane	ND	0.000	1	0.000		20
Ethene	ND	0.000	1	0.000		20
Propane	ND	0.000	1	0.000		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3277438-3 01/04/18 10:57 • (LCSD) R3277438-4 01/04/18 11:06

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Methane	0.0678	0.0754	0.0774	111	114	85.0-115			2.61	20
Ethane	0.129	0.111	0.111	85.9	86.4	85.0-115			0.602	20
Ethene	0.127	0.114	0.114	89.6	89.9	85.0-115			0.363	20
Propane	0.186	0.183	0.184	98.1	99.1	85.0-115			0.975	20

Method Blank (MB)

(MB) R3276826-4 12/29/17 10:17

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000331	0.00100
Ethylbenzene	U		0.000384	0.00100
Toluene	U		0.000412	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*104*			*80.0-120*
(S) a,a,a-Trifluorotoluene	*107*			*80.0-120*
(S) 4-Bromofluorobenzene	*108*			*80.0-120*
(S) Dibromofluoromethane	*93.7*			*76.0-123*

Laboratory Control Sample (LCS)

(LCS) R3276826-1 12/29/17 09:00

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.0250	0.0247	98.8	69.0-123	
Ethylbenzene	0.0250	0.0262	105	77.0-120	
Toluene	0.0250	0.0253	101	77.0-120	
Xylenes, Total	0.0750	0.0783	104	77.0-120	
(S) Toluene-d8			*102*	*80.0-120*	
(S) a,a,a-Trifluorotoluene			*105*	*80.0-120*	
(S) 4-Bromofluorobenzene			*114*	*80.0-120*	
(S) Dibromofluoromethane			*94.3*	*76.0-123*	

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

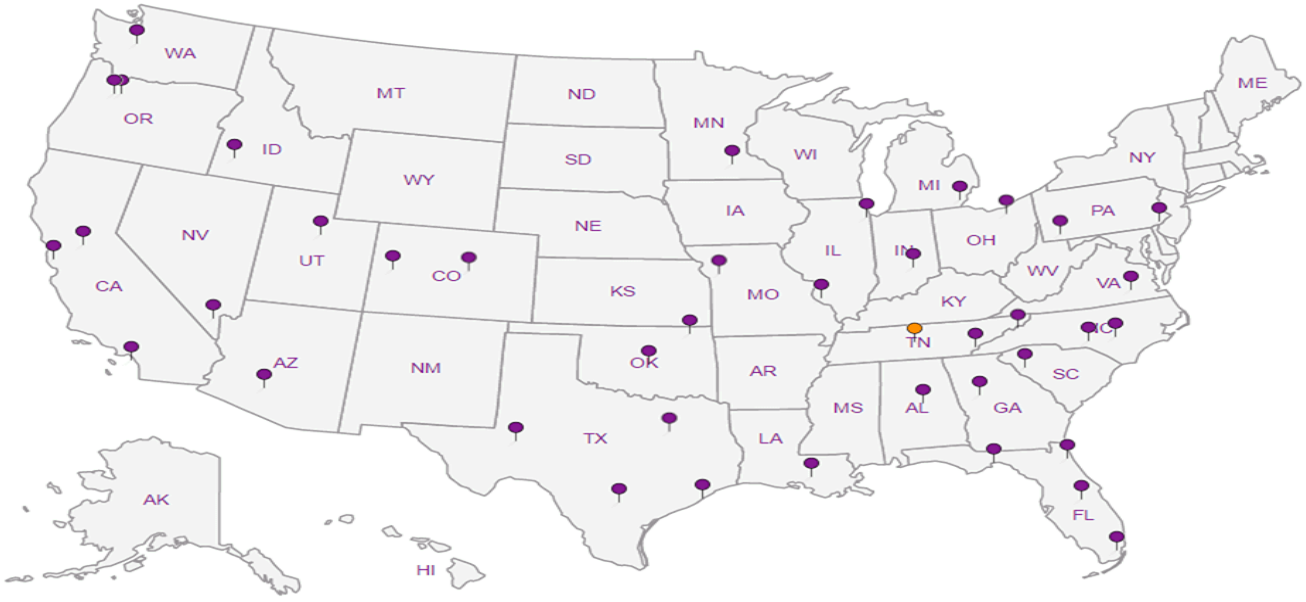
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



GES, Inc. - Sunoco

440 Creamery Way, Suite 500
Exton, PA 19341

Billing Information:

Accounts Payable
440 Creamery Way, Suite 500
Exton, PA 19341

Pres Chk

Report to: Holly Smoker

Email To: sgrillo@gesonline.com, hsmoker@geso

Project Description: Pre-Construction Sampling

City/State Collected: West Newton / Pennsylvania

Phone: 406-578-4501
Fax:

Client Project # 0204729 -06-160-KX

Lab Project # SUNGES-GRILLO

Collected by (print): Allison Emmons

Site/Facility ID #:

P.O. #:

Collected by (signature): Allison

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #:

Date Results Needed: Standard TAT

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	**pH,SPCON,TDS,TURB* 250ml plastic NP	ALK, Br, Cl, SO4 250ml plastic NP	Total Mtls, Hardness 250ml plastic HNO3	RSK175 + Propane 40ml vial w/ HCL	TSS 1L plastic NP	V8260BTEX 40ml vial w/ HCL	****DW COLILERT**** microbiological	****DW Fecal**** microbiological	Remarks	Sample # (lab only)
12282017-039-01	Grab	DW	—	12/28/17	1610	12	X	X	X	X	X	X	X	X		-01

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LABORATORIES

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L960221

H043

Acctnum: SUNGES
Template: T126128
Prelogin: P611030
TSR: 134 - Mark Beasley
PB:

Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other

Remarks:
Metals = Ba,Ca,Fe,K,Mg,Mn,Na
****Log COLILERT & FC as DW matrix****

pH ___ Temp ___
Flow ___ Other ___

Samples returned via:
__ UPS X FedEx __ Courier __ ___

Tracking # 4094 8308 1937

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: 6.6 °C Bottles Received: 12

Date: 12-29-17 Time: 845

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable:
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

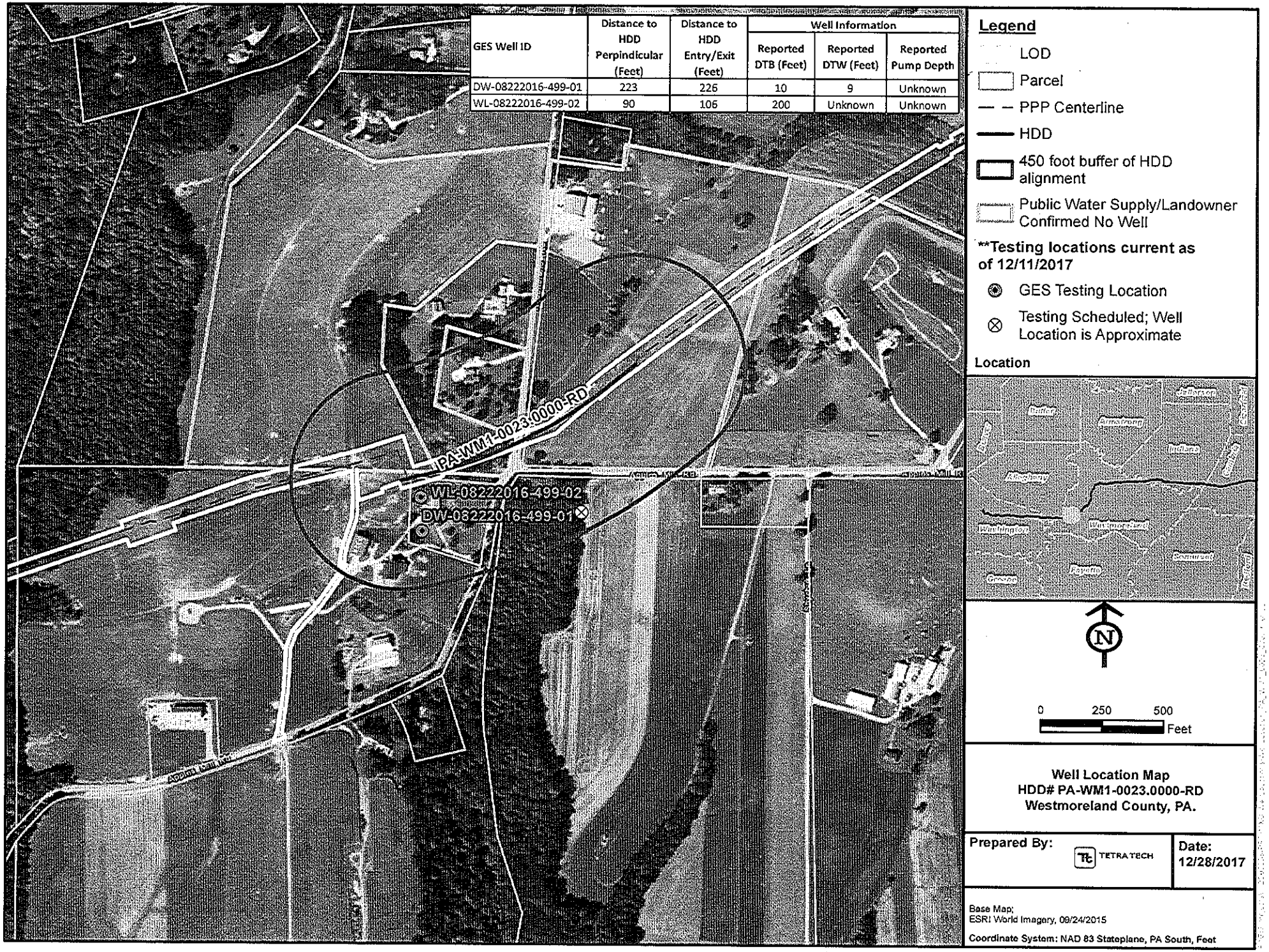
If preservation required by Login: Date/Time:

Hold:

Conditions: NCF / OK

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Allison Emmons	12/28/17	1720	FedEx 12/28/17 1720
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for labby: (Signature) Jennifer Boyd 836

Response to Question 3.b.



GES Well ID	Distance to HDD Perpindicular (Feet)	Distance to HDD Entry/Exit (Feet)	Well Information		
			Reported DTB (Feet)	Reported DTW (Feet)	Reported Pump Depth
DW-08222016-499-01	223	226	10	9	Unknown
WL-08222016-499-02	90	106	200	Unknown	Unknown

Legend

- LOD
- Parcel
- PPP Centerline
- HDD
- 450 foot buffer of HDD alignment
- Public Water Supply/Landowner Confirmed No Well

****Testing locations current as of 12/11/2017**

- GES Testing Location
- Testing Scheduled; Well Location is Approximate

Location

N

0 250 500 Feet

Well Location Map
HDD# PA-WM1-0023.0000-RD
Westmoreland County, PA.

Prepared By: TETRA TECH

Date: 12/28/2017

Base Map:
ESRI World Imagery, 09/24/2015

Coordinate System: NAD 83 Stateplane, PA South, Feet