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June 10, 2019

Mr. Joshua P. Cook, P.E.
Environmental Engineer
New York State Department of Environmental Conservation
Division of Environmental Remediation
615 Erie Boulevard West
Syracuse, New York 13204

Subject: Former GE Farrell Road, NYSDEC Site No. 734055
Response to Submittal of Subsurface Investigation Work Plan
in the Vicinity of Building #2

Dear Mr. Cook:

On behalf of Lockheed Martin Corporation (Lockheed Martin), AECOM Technical Services, Inc. (AECOM) is re-submitting the enclosed *Subsurface Investigation Work Plan in the Vicinity of Building #2* (work plan). The work plan has been revised to address comments received from the New York State Department of Environmental Conservation (NYSDEC) dated May 17, 2019 regarding the document that was provided to NYSDEC on May 1, 2019.

The NYSDEC comments are repeated below in bulleted, italic font and followed by Lockheed Martin's response in regular font.

1. Section 4.1.1 – Dust suppression must be employed during concrete coring activities. That may include using wet cutting techniques and/or using a vacuum to collect dust.

An AECOM-developed standard operating procedure (SOP) entitled *Dust Control and Ventilation during Concrete Coring and Drilling Activities Inside Building #2* is referenced in Section 3.1 of the revised work plan and is included in Attachment A. The SOP specifically addresses using wet cutting techniques and/or using a vacuum with a HEPA filter to collect dust.

2. Section 4.1.2 – Digital photographs must be taken of the soil cores. All soil cores must be described in writing as to color (including the presence of mottling), grain size, sorting, cohesiveness, and the presence or absence of odors, staining, or other signs of contamination. Obvious man-made objects such as brick fragments, metal scrap, or concrete must be clearly identified. Grain size and sorting must be described in detail. If staining, discoloration, or contamination is noted along specific layers or other structures, the characteristics and stratigraphic position of these layers must be clearly noted. In addition, any other indirect evidence of contamination (such as odors, coating on downhole tools, or lifting of contamination to the surface during the sample recovery) must be noted in writing on the soil boring log.

Section 4.1.2 has been revised to include the above requirements, however it is noted that field staff will not be encouraged to smell samples in order to determine odor. If an odor is obvious, it will be noted, however in general, the PID meter and the hand-held chromatograph will be utilized to indicate presence of impact.

3. Section 4.1.3 – A soil sample must be collected from at least 10 percent of the soil intervals analyzed using the portable chromatogram and will be analyzed by a laboratory certified by the NYSDOH Environmental Laboratory Approval Program (ELAP). A groundwater sample will be collected from at least 10 percent of the locations analyzed using the portable chromatogram and analyzed by an ELAP-certified laboratory.

Sections 4.1.3 and 4.5 of the revised work plan have been clarified to use wording as presented in comment 3 and in essence meets the intent of the approach outlined in the original work plan.

4. Section 4.1.3, 4th Sentence – This is acceptable; however, if a sample's results have elevated reporting limits and yet none of the target compounds are detected, then the location will need to be reevaluated using the full Target Compound List (TCL); either by reanalyzing the soil and/or through groundwater sampling.

The NYSDOH ELAP-certified laboratory scheduled for the analysis has acknowledged that the equipment will be calibrated for the target compound list, so in the event there are elevated reporting limits without any target compounds detected, the laboratory will be able to reprocess the data to report the TCL. Section 4.1.3 of the work plan has been updated accordingly.

5. Section 4.1.3, 3rd Sentence – A sample must be collected from the interval above the till for any borings which are heavily impacted.

In an effort to be consistent during proposed field activities, a soil sample will be collected above the till for any soil boring where an interval exhibits a PID reading greater than 250 parts per million (ppm). Please note that this approach will not limit the circumstances where a soil sample is collected above the till. Section 4.1.3 of the work plan has been updated accordingly.

6. Section 4.1 and 4.2 – The soil borings must be grouted from the bottom-up with cement-bentonite grout using a tremie tube upon completion. Given that the initial borings will be installed using a direct push drill rig (approximately 2-inch diameter borehole), and then the monitoring wells will be installed using a hollow-stem auger (HAS) (approximately 7- and 9-inch outside diameter), there is little risk that the entire soil boring (and grout) will not be removed by the HAS. So, it seems there is little benefit to keeping the boreholes open, and if they are left open it seems there is some risk of contamination entering the borehole or for other tampering to occur. Therefore, each soil boring must be grouted upon completion.

This comment is acknowledged and the work plan text has been revised in Section 4.2 to reflect the adjusted implementation approach.

7. Section 4.2 – Final Paragraph – Spillage of drill cuttings onto the ground will be minimized by placing plastic sheeting on the ground around the borehole (with a hole for the auger).

During monitoring well installation, a soils box will be used to contain any spillage of drill cuttings. In our experience, the use of plastic sheeting can increase the risk for slips in the work area. Following completion of the well install, general housekeeping activities will be conducted in the area. Section 4.2 of the work plan has been updated accordingly.

8. Section 4.2, Final Paragraph – For any highly contaminated borings, the monitoring well must be constructed with a sump.

If, based on the data output from the hand-held chromatograph, it is suspected that the groundwater concentration is equal to or greater than 1% of the water solubility of the contaminant, the monitoring well will be constructed with a sump. Section 4.2 of the work plan has been updated accordingly.

9. Section 4.2, Final Paragraph – Specify the appropriate well construction materials for any locations where non-aqueous phase liquid (NAPL) is encountered.

In all cases, monitoring well installations will be constructed using Schedule 40, 2-inch polyvinyl chloride well casing and well screen. No revisions have been made to the work plan.

10. Section 4.2, Final Paragraph – Specify the maximum screen length that will be utilized, in case the top of the till is deeper in any locations. If the till is too deep at any location to allow a single well to effectively characterize and monitor the groundwater at that location, it may be necessary to install a well couplet.

The maximum screen length utilized for a monitoring well will be 10-feet. If at any location where the water column is expected to be greater than 10-feet and a permanent monitoring well is proposed for installation, two separate monitoring wells will be installed, one with a 5-foot screen set at the top of till, and one with a 5-foot screen set to straddle the water/soil interface. Section 4.2 of the work plan has been updated accordingly.

11. Section 4.5 – Groundwater sampling must be conducted in accordance with the procedures in the Interim Site Management Plan (ISMP).

This comment is acknowledged and Section 4.5 has been revised accordingly.

12. Section 4.5 – Groundwater must be sampled and analyzed for target analyte list metals from a subset of wells, to provide a baseline prior to any treatment.

Groundwater from a subset of up to 6 monitoring wells will be sampled and analyzed for target analyte list metals. Section 4.5 of the revised work plan has been updated accordingly.

13. Section 4.5 – If dedicated sampling tubing will be left in any of the wells, the tubing must be high-density polyethylene (HDPE).

This comment is acknowledged. All low-density polyethylene dedicated tubing was removed from monitoring wells during the second quarter groundwater sampling event.

14. Section 4.6 2nd Paragraph – Ensure the tubing for each soil vapor point is labeled as to whether it is the shallower or deeper vapor point.

This comment is acknowledged and will be implemented.

15. Section 4.8 – Investigation-derived waste must be managed in accordance with the ISMP.

This comment is acknowledged and Section 4.8 has been revised to specifically state this.

16. Figure 6 – A boring must be installed at locations A and I, and contingent borings must be added north of A and south of I. A boring must be installed inside the building immediately inside of the shed (between locations B-59 and J), as close to the building wall as possible.

This comment is acknowledged and Figure 6 has been revised to reflect the adjustment.

17. Attachments – Attach the SOPs for well development and the GeoProbe Screen Point 22 Groundwater Sampler, which were submitted by AECOM on May 15, 2019.

This comment is acknowledged and the SOP for well development has been included in Attachment A of the revised work plan. The GeoProbe Screen Point 22 Groundwater Sampler SOP is a secure document and cannot be combined electronically with Attachment A, however, a page has been inserted in Attachment A that provides the internet address to access the SOP. It should be noted that at a later date, the ISMP will be updated to include the well development SOP.

A. Section 3.2 – It is suggested the utility clearance be conducted over the entire area that appears to be source area, which would be roughly the area bounded by proposed/potential sampling locations A, G, 14, and 20, rather than only around the proposed boring locations in that area. It is noted some of this work may have already been completed as part of the planning for the sub-slab depressurization system (SSDS) to be installed.

Private utilities will be identified for the entire work area and surveyed onto a utility site map for use during investigation activities.

B. Section 4.1.2 – It is acceptable to begin the boring program near MW-27 and MW-31; however, LMC may want to consider beginning at the locations that are expected to be less contaminated and working back toward the source area in order to limit the potential for contamination of the field equipment, in particular the portable chromatograph.

Lockheed Martin and AECOM appreciate this input and acknowledge the benefits of both approaches and are willing to begin field activities in the vicinity of proposed locations 18, 19, and 20. The approach will however remain fluid in an effort to coordinate schedules with the investigation activities, Widewaters construction activities and potential new tenant occupation to the best of our ability.

C. Section 4.2, 1st Paragraph – it seems collecting the groundwater sample using the check valve may result in agitation of the water column which could result in turbid samples and could result in loss of VOCs. LMC/AECOM should consider whether using a peristaltic pump might result in more representative results. It seems it would also result in less waste and/or less time per sample, since the check valve would either have to be disposed after each location or decontaminated. The Department recognizes, though, that peristaltic pumps can also result in loss of VOCs during sampling.

Groundwater from temporary wells during investigation activities will be sampled using high density polyethylene tubing and a peristaltic pump. Section 4.2 of the work plan has been updated accordingly.

D. Section 4.5 – It is recommended LMC/AECOM consider including other parameters in the analyses that would be useful in determining appropriate treatment technologies (which may include in-situ oxidation, enhanced bioremediation and others), such as ferric and ferrous iron, sulfate, nitrate and nitrate, dissolved organic matter, natural oxidant demand, etc; however, those parameters could be included in subsequent sampling events.

Lockheed Martin and AECOM may consider including additional sampling activities for parameters that are typically analyzed from a soil matrix. No revisions have been made to the work plan.

E. Figure 7 – It is recommended LMC/AECOM consider completing the soil vapor sample points above the 12-inch cement seal in the same manner as shown in Attachment G of the ISMP.

It is confirmed that the tubing for each implant will be fitted with a valve at grade and protected under a flush-mount cover set in concrete. The text in Section 4.6 has been revised to indicate that it will be a connection valve utilized at grade.

We look forward to receiving approval from the NYSDEC to commence activities associated with the revised *Subsurface Investigation Work Plan in the Vicinity of Building #2*. If you have any additional questions or comments, please do not hesitate to contact me at (315) 440-6472.

Sincerely, AECOM

Carey Letts

Carey Letts
Project Manager

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Attachments: Subsurface Investigation Work Plan in the Vicinity of Building #2 (Revised June 2019)

AECOM

SUBSURFACE INVESTIGATION WORK PLAN
IN THE VICINITY OF BUILDING #2

NYSDEC Site Number: 734055

Former GE Farrell Road
Onondaga County
Town of Geddes, Syracuse, New York

Prepared for:
Lockheed Martin Corporation
Building EP6 – Room 100B
Liverpool, NY 13088

Prepared by:
AECOM
5015 Campuswood Drive
East Syracuse, NY 13057

May 2019
(Revised June 2019)

Certification Statement

I, Nickcole M. Evans, certify that I am currently a New York State registered professional engineer as defined in 6 NYCRR Part 375 and that this *Subsurface Investigation Work Plan* was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation dated 2010 (DER-10).

Nickcole M. Evans, P.E.
License Number 085978

06/10/2019
Date

In accordance with New York State Education Law, it is a violation for any person, unless she or he is acting under the direction of a licensed professional engineer, to alter this document in any way.

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Acronyms and Abbreviations

1,1,1-TCA	1,1,1-trichloroethane
1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
1,2-DCA	1,2-dichloroethane
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
AIW	Air Injection Well
AOC	Areas of Concern
COCs	Contaminants of Concern
CVOCs	Chlorinated Volatile Organic Compounds
DER-10	Technical Guidance for Site Investigation and Remediation
DNAPL	Dense Non-Aqueous Phase Liquids
Ftbg	feet below grade
ft	feet
GE	General Electric
HASP	Health and Safety Plan
ISCO	In-Situ Chemical Oxidation
ISMP	Interim Site Management Plan
LNAPL	Light Non-Aqueous Phase Liquids
MIP	Membrane Interface Probe
ML	Multi-Level Monitoring Wells
MW	Monitoring Well
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OBG	O'Brien & Gere
ppm	parts per million
RI	Remedial investigations
SCG	Standards, Criteria and Guidance
SDS	Safety Data Sheets
SSDS	Sub-Slab Depressurization System
SO_4^{2-}	Sulfate
sq. ft.	square feet
SVE	Soil Vapor Extraction
TAGM	Technical and Administrative Guidance Memorandums
TCE	trichloroethene
TOGS	Technical & Operational Guidance Series
USEPA	United States Environmental Protection Agency
USTs	Underground Storage Tanks
VOCs	Volatile Organic Compounds
VRW	Vapor Recovery Well

1. PURPOSE AND SITE DESCRIPTION

On behalf of Lockheed Martin Corporation (Lockheed Martin), AECOM is pleased to provide this *Subsurface Investigation Work Plan* (work plan) for the Former General Electric (GE) Farrell Road site (the site) located in the Town of Geddes, New York. The site consists of 16.6 acres located in an industrial setting on Farrell Road in the Town of Geddes, northeast of Routes 690 and 90 and south of the Seneca River (**Figure 1**).

The site includes an industrial building (Building #2) that is approximately 310,500 square feet (sq. ft.) in size, a garage that is approximately 8,000 sq. ft. in size and Class I wetlands on the north side of the site (**Figure 2**). Further north of the site, the Class I wetland area continues north to the Seneca River. Currently, the site is classified as Class 4 on the New York State Department of Environmental Conservation (NYSDEC) Registry of Inactive Hazardous Waste Disposal Sites (Site #734055).

This work plan includes historic soil and groundwater investigation data and locations, recent soil and groundwater investigation data and locations, and presents a plan of action to evaluate the extent of remaining soil and groundwater impacts adjacent to and beneath Building #2.

2. BACKGROUND

2.1 SOURCES AND PREVIOUS REMEDIAL ACTIVITIES – AREA OF CONCERN #5

Remedial investigations (RIs) conducted in the 1990s identified 16 areas of concern (AOCs) at the site. Historical activities associated with each AOC are summarized in the NYSDEC approved Interim Site Management Plan (ISMP) dated July 25, 2017, however information regarding AOC #5 is also provided below.

Up to nine 275-gallon underground storage tanks (USTs) containing both chlorinated and non-chlorinated solvents and a paint drippings drywell were located along the west wall of Building #2. The USTs were reportedly removed in 1986, and the drywell was removed in 1992. This area was identified as AOC #5. The approximate location of the former USTs and drywell are illustrated on **Figure 3**.

In 1992, a soil boring investigation was conducted in the vicinity of AOC #5 and throughout the interior of Building #2 to determine the extent of affected soil and groundwater beneath the building. Light, non-aqueous phase liquids (LNAPL) were observed at the approximate depth of the water table at borings and test pits installed near the location of the former USTs. A soil gas survey indicated the presence of volatile organic compounds (VOCs) and was followed by sampling and analysis which identified VOC concentrations, including chlorinated and aromatic hydrocarbons, in the soil. Downgradient of the former USTs, beneath the building, a suite of dissolved VOCs were detected similar to VOCs detected in the vicinity of the former USTs. Analytes detected at these downgradient locations and in exceedance of NYSDEC cleanup objectives included 1,1-dichloroethene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), 1,1,1-trichloroethane (1,1,1-TCA), 1,2-dichloroethane (1,2-DCA), trichloroethene (TCE), toluene, methyl isobutyl ketone, ethylbenzene, benzene, and xylenes. These historical soil and groundwater investigation locations are illustrated on **Figure 3**.

Various remedial options were evaluated for AOC #5, and soil vapor extraction (SVE) was selected as the appropriate interim remedial measure to manage soil impacts. The NYSDEC approved the selection, and the remedial system was installed between October and December 1994.

Following the installation of the SVE system wells in October 1994, free-phase LNAPL was observed at air injection wells (AIW) AIW-201, AIW-204, AIW-206, and vapor recovery well (VRW) VRW-207, and dense-NAPL (DNAPL) was observed at wells VRW-203 and AIW-201. Approximate locations of the historical VRWs and AIWs are illustrated on **Figure 4**. A follow-up investigation assessed the horizontal and vertical extent of LNAPL and DNAPL in AOC #5, and the phases were determined to be chemically similar (i.e., multi-component NAPLs). A NAPL monitoring and removal program was approved by the NYSDEC in October 1995. During the program (September 1995 through August 1996 with periods of monitoring only), approximately 7.76 gallons of DNAPL were removed from well VRW-203, and 1.7 gallons of LNAPL were removed from well VRW-207.

The SVE remedial system was activated on November 13, 1995 and operated until 2002. A confirmatory soil sampling program was conducted at AOC #5 in September 2002. A total of 18 soil samples were collected from a depth of 6 to 8 feet below grade (ftbg), corresponding to the depth at which the most affected pre-remedial samples had been collected. All VOCs in confirmatory samples were below laboratory detections, except 1,1,1-TCA which was detected at CSB-504 at a concentration of 0.269 parts per million (ppm), which was less than its unrestricted use soil cleanup objective of 0.68 ppm. The confirmatory samples were all collected from a depth of 6 to 8 ftbg and the approximate locations are shown on **Figures 3** and **4**. On November 1, 2002, Lockheed Martin requested approval to permanently shut down and decommission the SVE system at AOC #5 (Lockheed Martin, 2002), which was approved by the NYSDEC through correspondence dated December 9, 2002.

2.2 NATURE AND EXTENT OF CURRENT CONTAMINATION

2.2.1 The Wetlands

The wetlands area is on the north side of the property. The primary contaminants of concern (COCs) in the wetlands groundwater include chlorinated VOCs (CVOCs), predominantly 1,1-DCE, 1,1-DCA, and the solvent stabilizer, 1,4-dioxane. The wetlands area includes shallow, intermediate, and deep monitoring well clusters PMW-4, PMW-5, PMW-6, PMW-9, PMW-10, PMW-11, PMW-12, PMW-13, MW-32; multi-level monitoring wells ML-2 and ML-3; and solitary monitoring wells MW-18 and MW-28.

An in-situ chemical oxidation (ISCO) injection event was conducted in the wetlands area in August and September 2018 as part of an optimized remedial approach to reduce CVOC concentrations in the deep groundwater zone. Further information regarding the injection event was summarized and submitted to the NYSDEC in the *Revised In-Situ Chemical Oxidation Summary Report* in December 2018. The wetlands area is downgradient of AOC #5 and Building #2 and is not discussed further in this report.

2.2.2 Area of Concern #5 and Building #2

AOC #5 is on the west side of Building #2 and the primary COCs in soil and groundwater include benzene, ethylbenzene, toluene, and xylenes (BTEX). CVOCs have also been observed in groundwater however, some occasions may have been obscured due to high laboratory dilutions. Concentrations of CVOCs presented in this and future sections of the report as well as on **Figures 3**, **4**, and **5**, include 1,1,1-TCA, 1,1-DCE, 1,1-DCA, TCE and Freon-11. The AOC #5 area includes monitoring well MW-27 and the Building #2 area includes monitoring wells MW-31 and MW-101 through MW-107. For the remainder of this report, the AOC #5 and Building #2 areas will be referred to as 'in the vicinity of Building #2'.

As discussed in Section 2.1, a SVE remediation system operated in in the vicinity of Building #2, between 1995 and 2002 and in accordance with NYSDEC approval was permanently deactivated in December 2002. In August 2016, five membrane interface probe (MIP) borings (MIP-1, MIP-2, MIP-3, MIP-4, and MIP-19) were advanced to assess current soil conditions at the base of the surficial geologic unit and to determine whether there were residual source areas in the vicinity of Building #2.

During MIP investigation activities, a groundwater monitoring well was identified on the west side of Building #2 and a groundwater sample was collected for analysis. It is unclear what well this was, but it has since been designated MW-27. Soil borings were advanced using rotary hollow stem augers, immediately adjacent to MIP-1, MIP-4, and MIP-19, and were identified as SB-1, SB-4, and SB-19, respectively (locations shown on **Figure 5**).

Soil samples were collected from SB-1 at depths of 9 to 10 ftbg and 13 to 14 ftbg. The sample from 9 to 10 ftbg exhibited a total BTEX concentration of 66,000 micrograms per kilogram (µg/kg) and below laboratory detection limits for CVOCs. The sample from 13 to 14 ftbg exhibited a total BTEX concentration of 2,631 µg/kg and 18.3 µg/kg for CVOCs. Between September 2016 and November 2018, groundwater has been collected from MW-27 on nine occasions. During this time period, the maximum VOC concentration was observed at MW-27 on May 22, 2018. On this date, the concentration of BTEX was 25,360 micrograms per liter (µg/L) and CVOCs were below laboratory detection limits. Based on soil and groundwater data collected at MW-27, residual source material was determined to be present on the west side of Building #2.

Soil samples were collected from SB-4 at depths of 24 to 25 ftbg and 27 to 28 ftbg. The sample from 24 to 25 ftbg exhibited a total BTEX concentration of 15.2 µg/kg and 96.2 µg/kg for CVOCs. Multi-level monitoring well ML-1 was installed at SB-4 with sample intervals at approximately 12.5 ftbg (ML-1A), 23.5 ftbg (ML-1B), and 26.5 ftbg (ML-1C). Of the three sample intervals, ML-1C is monitored on a quarterly basis. Between December 2016 and November 2018, groundwater has been collected from ML-1C on nine occasions. During this time period, the maximum VOC concentration was observed at ML-1C on March 7, 2017. On this date, the concentration of BTEX was 10.7 µg/L CVOCs were 134 µg/L.

In 2017, a laboratory bench-scale treatability study was completed in an effort to evaluate alternative remedial options primarily to address groundwater impacts in the wetland area of the site.

Soil collected in the vicinity of Building #2, on the west side, was also tested during the treatability study for soil and groundwater oxidant demand, so that the area could be considered for inclusion in a field pilot study. In November/December 2017, an ISCO field pilot test was conducted in the vicinity of Building #2, on the west side, to evaluate its potential to address residual soil and groundwater impacts in this area.

In general, it was difficult to draw a decisive conclusion about the effectiveness of ISCO in this area due to surfacing and lack of knowledge regarding remaining impacts in soil. A summary of the field pilot test was submitted to the NYSDEC on April 26, 2018 titled *In-Situ Chemical Oxidation Pilot Test Summary Report*.

An additional monitoring well was installed in the vicinity of Building #2 during pilot test activities. A soil boring was advanced approximately 40 feet (ft) downgradient of MW-27 and within the footprint of Building #2 and a permanent monitoring well was installed (MW-31). Soil samples were collected during the installation of MW-31 from between 10 to 12 ftbg and 16 to 18 ftbg using a split-spoon sampler. The collected soil samples were analyzed for VOCs which were only detected above Standards, Criteria and Guidance (SCGs) in the 10 to 12 ftbg sample, including ethylbenzene, m,p-xylene and o-xylene. Total concentrations for BTEX were 20,600 µg/kg in MW-31(10 to 12 ftbg) and 82.5 µg/kg in MW-31 (16 to 18 ftbg). Between November 2017 and November 2018, groundwater has been collected from MW-31 on five occasions. During this time period, the maximum VOC concentration was observed at MW-31 on May 22, 2018. On this date, the concentration of BTEX was 166,000 µg/L and CVOCs were 3,170 µg/L. This additional soil and groundwater data confirms the determination that residual source material is present in the vicinity of Building #2.

In July 2018, six monitoring wells were encountered within Building #2 during a ground penetrating radar survey for private utilities, and a seventh encountered in January 2019. These wells were part of historical investigation activities completed in 1992 and were previously believed to have been decommissioned. Borings associated with these wells are B-56, B-60, B-52, B-47A, B-62, B-84 and B-61 which have been renamed MW-101, MW-102, MW-103, MW-104, MW-105, MW-106, and MW-107, respectively. Each of these seven wells has a screen length of 5-ft and screen depths range from 6.0 - 11.0 ftbg through 8.3 – 13.3 ftbg. BTEX concentrations have ranged from below detection limits at MW-106 on November 29, 2018 to 110,900 µg/L at MW-103 on August 2 2018. CVOC concentrations have ranged from 2.0 µg/L at MW-101 on August 3, 2018 to 70,020 µg/L at MW-103 on August 2, 2018. Monitoring well MW-107 was sampled for the first time as part of the first quarter 2019 sampling event. The data has not yet been validated but is reported here in draft for discussion purposes and without supporting laboratory data. The BTEX concentration at MW-107 was 4,110 µg/L and 8,968 µg/L for CVOCs on March 12, 2019. **Figure 5** highlights soil samples collected since 2015 and the highest groundwater concentrations recorded during quarterly events conducted in 2016 through 2018.

2.3 GEOLOGY AND HYDROGEOLOGY

Historic and recent site investigations demonstrate the site geology includes soils that are composed of a medium to fine sand and silt with traces of clay.

The relative uniformity of the soils is supported by data collected during the 2016 MIP investigation which indicated little variability in conductivity, hydraulic pressure, and flow rates into the formation. Based on the halogen-specific detector, photoionization and flame ionization readings collected by the MIP, it does not appear that there are seams and/or layers of relatively fine grain sediment that have adsorbed and/or concentrated contaminant mass (AECOM, 2017).

The overburden material generally consists of fine sand and silts with traces of clay that coarsens downwards with depth to a fine to medium grain sand with trace fine gravel. This surficial unit transitions to an underlying dense red clay glacial till at depths ranging between approximately 12 and 26 ftbg in the vicinity of AOC #5 (AECOM, February 2017). The red clay till unit is at least 104 ft thick in the vicinity of Building #2 (ERM, 1995) and is believed to represent a relatively impermeable boundary that restricts downward contaminant migration.

Based on recent groundwater gauging events, groundwater in the surficial geologic unit flows in a northerly directly with an exception noted in the vicinity of Building #2, where groundwater flow exhibits a northeasterly component from the west side of the building before flowing north.

2.4 REMEDIAL ACTION OBJECTIVES

In accordance with the NYSDEC approved ISMP dated July 25, 2017 the remedial action objectives are defined as follows:

1. Mitigate the potential threat to the Class I wetland biotic community resulting from the continued migration of contaminated groundwater to the wetland from in the vicinity of Building #2 area.

Groundwater SCGs identified for the site were and will continue to be based on NYSDEC Ambient Water Quality Standards and Guidance Values.

Soil SCGs identified for the site were based on NYSDEC Technical and Administrative Guidance Memorandums (TAGMs) #4046 soil cleanup objectives for the protection of human health and the environment. TAGM #4046 was replaced by the NYSDEC Commissioner Policy 51: Soil Cleanup Guidance Policy (CP-51) which became effective December 3, 2010 and references Table 375-6.8(b) Restricted Use Soil Cleanup Objectives of Title 6 NYCRR Part 375 for sites that are part of the Inactive Hazardous Waste Disposal Site Remedial Program. The site is under the program and is listed as Site #734055.

There are five downgradient monitoring locations to the north of Building #2, including ML-1A/B/C, MW-3S/D, PMW-14S/I/D, PMW-15S/I/D, and PMW-24S/I/D, which are over 300 ft downgradient of residual impacts identified near the west side of Building #2. Based on the current site well network and historic groundwater contour plots, these wells offer the best reference for downgradient conditions. Based on the analytical data from existing wells in this downgradient area, the associated groundwater plume appears to be stable and does not currently present a risk pathway to wetlands and surface water (Seneca River).

2. Protect potential future on-site workers.

The potential for soil vapor intrusion to Building #2 is an active risk pathway and is currently being addressed by the operation of three sub-slab depressurization systems (SS-05, SS-06, and SS-08).

SS-05 is centrally located along the easternmost wall, SS-06 is located on the south side of the partitioning wall that separates the high-bay portion of the building, and SS-08 is centrally located along the westernmost wall. At the time of this work plan, O'Brien & Gere (OBG) and Lockheed Martin are working to expand the coverage of the current systems including the addition of a new system.

3. Achieve groundwater and soil standards, within the vicinity of Building #2.

The implementation of this investigation work plan is with the intent to work towards addressing the above remedial objective.

2.5 WORK PLAN GOALS

The primary goals of this work plan are as follows:

- Evaluate the nature and extent of remaining soil impacts in the vicinity of Building #2,
- Evaluate the nature and extent of groundwater impacts in the vicinity of Building #2, and
- Identify sources of impacted sub-slab vapor.

Current analytical data when compared to historical data shows that impacts to soil and groundwater remain in the vicinity of Building #2. However, additional groundwater and soil investigation is needed to define the horizontal and vertical extent of these impacts.

3. GENERAL AND PREPARATORY FIELD ACTIVITIES

3.1 HEALTH AND SAFETY

The site-specific Health and Safety Plan (HASP) has been updated for 2019 and outlines procedures that will be undertaken to protect site workers and visitors from potential hazards that may exist as a result of the fieldwork performed at the site. A copy of the HASP will be located on-site during the fieldwork.

General housekeeping practices will be employed for the duration of this work. The work in expected to generate minimal dust, however, dust may be generated during concrete coring activities and also be tracked from outside of the building into the building during the transfer of soils from the work area to disposal containment. An AECOM-developed standard operating procedure (SOP) titled *Dust Control and Ventilation during Concrete Coring and Drilling Activities Inside Building #2,* is provided in **Attachment A** and will be used during field activities. In general, dust control measures will include use of water, a shop-vac with HEPA filter and a sweeping compound will be scattered over the area to be swept, and then swept up to remove the dust on the floor.

Swept up material will be disposed of in conjunction with waste generated during drilling activities. A Safety Data Sheet for an example product is included in **Attachment B**.

Drill rig operations inside of Building #2 will be the primary source of noise during investigation activities, specifically, when the hammer is in operation to advance sample collection. During work activities, noise levels will be monitored at pre-defined locations within Building #2, focused in areas of tenant occupancy. In advance of field implementation, a site-specific sound monitoring procedure will be developed for use during investigation activities and will be provided to the property owner, NYSDEC, and NYSDOH in advance of mobilization.

3.2 UTILITY CLEARANCE AND GEOPHYSICAL SURVEY

In advance of any intrusive activities, a private utility location contractor will clear each proposed monitoring well location using at a minimum, ground penetrating radar, electromagnetic induction sensors, variable wattage magnetometers, video inspection with locatable heads, and all necessary support tools.

Client specific utility clearance procedures and AECOM's Underground Utilities & Subsurface Installation Clearance Checklist will be completed ahead of the work, and will be approved by an internal health and safety professional, and the Client representative. A DigSafe NY work ticket will be initiated prior to any intrusive activities.

3.3 COMMUNITY AIR MONITORING

The Community Air Monitoring Plan (CAMP) has been developed for use at this site and will be followed during all intrusive fieldwork (soil borings and monitoring well installations). The CAMP is included in Appendix B of the approved ISMP.

3.4 FIELD EQUIPMENT

During field activities described in Section 4, soil will be screened using a photo-ionization detector (PID). Further field screening will be conducted for both soil and groundwater using a Defiant Technologies Frog-4000 (Frog-4000) system. The Frog-4000 is a hand-held micro system that is outfitted with a sensor that can detect compounds with an ionization potential of 10.6 eV or less. The Frog-4000 will be used specifically to identify the presence of benzene (9.25 eV), toluene (8.82 eV), ethylbenzene (8.76 eV), xylenes (8.56 eV), trichloroethene (9.45 eV), and 1,1-DCE (9.6 eV) in soil and groundwater samples during this event. The Frog-4000 separates target analytes in less than five minutes and displays chemical concentrations on its LCD display. The Frog-4000 sample results will be used by the field team in determining the need for advancement of contingent borings to fully delineate soil and groundwater impacts in the vicinity of Building #2.

An AECOM-developed SOP titled *VOC Screening using FROG 4000*, is provided in **Attachment A** and will be used during field activities.

4. REMEDIAL INVESTIGATION FIELD ACTIVITIES

4.1 SOIL BORINGS

Twenty three (23) soil borings will be advanced using direct-push technology (DPT). Five boring locations will be situated outside of Building #2 (identified as 1, 2, 3, 21, and 22 on **Figure 6**) and 18 boring locations will be situated inside Building #2 (identified as 4 through 20 and 23 on **Figure 6**). Each proposed soil boring location is shown in red and is identified in the legend on **Figure 6**. Additional contingent soil boring locations are shown in blue and represent locations that may be advanced based on the field data collected at red locations using a PID and Frog-4000 units. For example, if a soil sample exhibits a PID reading above 5 ppm; it will be analyzed using the Frog- 4000 unit. If the VOC concentrations in soil are greater than the corresponding CP-51 SCGs, the nearest contingent (blue) soil boring will be advanced. This method of sampling and stepping out will continue until no VOCs are detected at concentrations greater than the corresponding CP-51 SCGs. In addition, if a groundwater sample contains VOCs at concentrations greater than the corresponding Technical & Operational Guidance Series (TOGS) 1.1.1 for Ambient Water Quality Standards and Guidance Values SCGs, the nearest contingent (blue) soil boring will be advanced so that a groundwater sample can be obtained. As such, contingent soil boring locations shown on **Figure 6** are representative of the stepping out process and additional locations may be added beyond contingent locations. This determination will be made in the field based on collected data and in communication with the NYSDEC.

Boring locations 1, 2, and 3 shown on **Figure 6** are proposed approximately 20-25 ft west, south, and north, respectively, to further evaluate soil and groundwater impacts identified at SB-1 and MW-27 (**Figure 5**). Boring locations 4, 12, and 13 are proposed adjacent to sub-slab sample locations SS-16, SS-15, and SS-24, respectively, to evaluate soil, groundwater and soil gas conditions in relation sub-slab vapor conditions. Boring location 16 is proposed adjacent to monitoring well MW-107 and sub-slab vapor sample location SS-25 to evaluate soil and soil gas conditions in relation to groundwater and sub-slab vapor conditions. Boring locations 21, 22, and 23 have been added based on comments received in correspondence from the NYSDEC dated May 17, 2019.

The remaining boring locations have been located adjacent to historical soil and groundwater sample locations for comparison, and in some cases to define soil and groundwater conditions at offset locations from existing data points.

4.1.1 Soil Boring Installation

Boring locations within Building #2 will be initiated using a concrete corer to penetrate the concrete slab which is estimated to be 6-inches thick. Boring locations outside of Building #2 will be saw cut in asphalt in a 2-ft x 2-ft square or, if the locations are in a grass area the turf will be lifted. Each boring location will be pre-cleared to a minimum depth of 5 ftbg, and possibly 8 ftbg depending on the proximity to suspected or known sub-grade features, using a 4-inch hand auger. The pre-clearance zone will be logged for lithology, scanned with a PID unit in 1-ft intervals, and if warranted, analyzed using the Frog-4000 hand-held unit. The hand auger is assumed to be appropriate for locations within the Building #2 footprint based on lithology documented on historical and recent soil boring logs.

Locations exterior to Building #2 may have additional subsurface obstructions due to historical activities that require the use of compressed air and vacuum extraction during pre-clearance activities. The appropriate tooling will be used at each location based on field observations.

4.1.2 Soil Boring Sampling

Each soil boring will be advanced using a DPT drill rig equipped with Macro-Core™ samplers, which will allow for continuous soil sampling from the base of the pre-clearance zone to the bottom of the borehole. Each Macro-Core™ sample will be scanned with a PID unit in 1-ft intervals, digitally photographed and described in writing as to color (including the presence of mottling), grain size, sorting, cohesiveness, and the presence or absence of general odors, staining, or other signs of contamination. Obvious man-made objects such as brick fragments, metal scrap, or concrete will be clearly identified and grain size and sorting will be described in detail. If staining, discoloration, or contamination is noted along specific layers or other structures, the characteristics and stratigraphic position of these layers will be clearly noted. In addition, any other indirect evidence of contamination (such coating on downhole tools, or lifting of contamination to the surface during the sample recovery) will be noted in writing on the soil boring log..

Sampling will be advanced to the top of the till unit, and based on historical borings in and around Building #2, it is anticipated to be encountered between 15 and 19 ftbg. A portable drill rig with the same sampling capabilities may also be used depending on site accessibility.

Field activities will likely be initiated in the vicinity of MW-27 and MW-31 (**Figure 6**) given known soil conditions. As described above, PID readings will be recorded from collected soils in 1-ft intervals. If the PID readings are above 5 ppm, a soil sample from that interval will be analyzed using the Frog-4000 hand-held unit, in accordance with the SOP in **Attachment A**, and recorded on field data sheets.

4.1.3 Sample Analysis

Soil samples will be collected from each boring for at least 10 percent of the soil intervals analyzed using the Frog-4000 hand-held unit. Soil samples will be collected based on the interval with the highest field-screened PID reading, Frog-4000 data, and/or field observations. If impacts are not observed, a sample will be collected from the 1-foot interval that intersects the water table, and possibly a second sample from the bottom of the boring to confirm conditions above the till unit. If any soil samples within a boring exhibit a PID reading greater than or equal to 250 ppm, a sample will be collected above the bottom of the boring, immediately above the till. Soil samples will be analyzed for the site-specific list of VOCs by EPA Method 8260C by a laboratory certified by the NYSDOH Environmental Laboratory Approval Program (ELAP). If a sample's results have elevated reporting limits and yet none of the site-specific VOC compounds are detected, the laboratory will reprocess the data for the full Target Compound List. The site-specific list of VOCs was proposed in the Conceptual Pilot Study Investigation Summary Work Plan dated February 15, 2017 and was approved with adjustments by the NYSDEC on February 24, 2017.

4.2 TEMPORARY AND PERMANENT MONITORING WELL INSTALLATION

At each advanced soil boring location, as described in Section 4.1, the Screen Point 22 (SP22) groundwater sampler from Geoprobe Systems® will be used for the collection of groundwater samples. The SP22 temporary stainless-steel screen will be used to collect groundwater samples using dedicated high density polyethylene tubing and a peristaltic pump. The collected groundwater will be analyzed for VOCs using the Frog-4000 for real time data to support delineation of the impacted ground water plume beneath Building #2. Groundwater samples will also be collected for laboratory analysis for the site-specific list of VOCs by EPA Method 8260C by a laboratory certified by the NYSDOH Environmental Laboratory Approval Program (ELAP). Following sample collection, the stainless-steel screen will be removed and the boring will be grouted from the bottom-up with cement-bentonite grout using a tremie pipe

Once all borings have been advanced and groundwater samples have been collected using the SP22 sampler, data will be reviewed and a selection of investigation locations will be identified for the installation of permanent monitoring wells.

In general, several monitoring wells will be installed in areas where impacts are documented during field activities and at plume perimeter locations to monitor potential plume migration. Upgradient wells may also be installed to monitor background groundwater conditions. The exact number of permanent monitoring wells installed will be based on site conditions, soil and groundwater observations, analytical results provided using the Frog-4000, and discussions with the NYSDEC.

Permanent monitoring wells will be installed using a hollow-stem auger (HSA) drill rig to the depth where top of till was encountered. A soils box will be used around the auger as a housekeeping measure during well installation. In all cases, Schedule 40, 2-inch polyvinyl chloride (PVC) well casing will be installed with a 10-slot well screen that extends from at least 1-ft above the soil/groundwater interface to the top of till. If, based on the data output from the hand-held chromatograph, it is suspected that the groundwater concentration is equal to or greater than 1% of the water solubility of the contaminant, the monitoring well will be constructed with a sump. Quartz #0 sand will be installed in the borehole void around the well screen and riser to approximately 1-foot above the top of screen, followed by a 2-foot thick interval of hydrated bentonite, and completed to grade with a cement-bentonite grout. The well head will be secured with an expandable j-plug and lock and will be protected by a heavy-duty flush mount protective cover. The maximum screen length utilized for a monitoring well will be 10-ft. If the water column is expected to be greater than 10-ft two separate monitoring wells will be installed, one with a 5-ft screen set at the top of till and the second with a 5-ft screen set to straddle the water and soil interface. All soil cuttings generated during well installation will be managed as described in Section 4.8 and in accordance with the ISMP.

4.3 MONITORING WELL REPLACEMENT

Six existing monitoring wells in Building #2 (MW-102 through MW-107) will be replaced during the investigation field mobilization. Based on the well construction logs, these wells were installed using 5 ft of 2-inch diameter 0.010 slot PVC screen.

The wells were installed to an average depth of 12 ftbg in an area where the top of till is estimated to range between 15 and 19 ftbg. As constructed and following well development procedures, these wells have only 1 to 3 ft of available groundwater column and slow recovery rates.

MW-102 through MW-107 will be over-drilled using a HSA drill rig equipped with either 6.25 or 8.25-inch diameter augers. The auger size will be determined once the existing annulus diameter is identified. The existing concrete, protective casing and PVC screen and riser will be removed. The remaining well construction materials (sand, bentonite and grout) will be removed using the appropriate size auger. Once the existing well materials have been removed, the boring will be advanced to the top of the till unit. A replacement groundwater monitoring well will be installed at each location using 10 ft of 0.010 slot PVC well screens and completed in a similar manner as permanent monitoring wells described in Section 4.2. The new wellheads will be secured with an expandable j-plug and lock and will be protected by a heavy-duty flush mount protective cover.

4.4 WELL DEVELOPMENT

Each newly installed and replacement monitoring well will be developed not sooner than 24 hours after their installation to evacuate fine-grained sediments that may have accumulated within the well during installation. Well development will be completed in accordance with SOP provided in **Attachment A**.

4.5 GROUNDWATER SAMPLING

Groundwater sampling will be conducted in accordance with the ISMP. Groundwater samples will be collected for laboratory analysis of the site-specific list of VOCs by EPA Method 8260C and a subset of up to six groundwater samples will be collected for laboratory analysis of target analyte list metals by EPA Method 6010C by a laboratory certified by the NYSDOH Environmental Laboratory Approval Program (ELAP).

4.6 SOIL VAPOR POINT INSTALLATION

The results of recent sub-slab soil vapor (SSSV) sampling conducted by OBG and groundwater sampling, conducted by AECOM in the vicinity of Building #2, did not correlate well with each other, thereby suggesting that there may be a vadose zone soil vapor source. The purpose of installing nested sampling points is to identify and evaluate potential source(s) of soil vapor. The proposed investigation consists of vertical soil vapor profiles through the vadose zone at four previously sampled SSSV locations (SS-15, SS-16, SS-24, and SS-25). The locations were selected where soil vapor concentrations are highest and where the soil vapor chemical profiles are different from each other.

Nested soil vapor sampling points will be installed at 4 ft below the bottom of the concrete slab and at 1 ft above groundwater (approximately 8 ft below bottom of the slab). As shown on **Figure 6**, soil vapor points will be installed at four locations. For each vapor point, a borehole will be advanced to 8 ftbg using hand tools; 6-inch long soil vapor implants will be connected to Teflon tubing and set in glass beads at approximately 4 and 8 ftbg.

Hydrated bentonite will be installed to separate the 8 ft and 4 ft zones as well as between the 4 ft zone and the ground surface. The tubing for each implant will be fitted with a connection valve at grade and protected under a flush-mount cover set in concrete. A generic nested soil vapor point installation design is provided as reference on **Figure 7**.

Soil vapor samples from the nested vapor points will be collected by OBG during a similar timeframe as the collection of groundwater samples from proximal monitoring wells. The collected data will provide a more complete dataset from which a conceptual model can be developed of soil vapor beneath Building #2.

4.7 SURVEYING

Elevations and locations of newly installed and replacement monitoring wells will be surveyed. These locations will be referenced to standard horizontal control and vertical control by a licensed land survey. Vertical elevations of the casings and elevations of the ground surface will be measured to the nearest 0.01 foot, referenced to mean sea level. The horizontal location will be measured to the nearest 0.1 foot and referenced to the NYS Plane Coordinate System.

4.8 DECONTAMINATION AND MANAGEMENT OF INVESTIGATION DERIVED WASTE

All investigation-derived waste will be managed in accordance with the SOP included in Appendix G of the approved ISMP.

All non-dedicated field equipment will be decontaminated in accordance with the SOP included in Appendix G of the approved ISMP.

5. SCHEDULE AND REPORTING

AECOM will implement this work plan following NYSDEC and New York State Department of Health (NYSDOH) approval. It is anticipated that the scope of work will be completed within 35 days of initiating remedial investigation field activities.

Following the subsurface investigation implementation, a summary report will be prepared and submitted to document completion of the investigation. The report will summarize the monitoring well and soil vapor point installations, boring logs, and analytical results. Additionally, field observations, process monitoring results and recommendations will be included in the summary report. The summary report will be submitted to the NYSDEC within 90 days of the subsurface investigation event completion.

6. REFERENCES

ERM-Northeast, Inc., July 10, 1992. 1992 Environmental Investigation GE Farrell Road Plant Two (FRP-2).

ERM-Northeast, Inc., May 1995. Remedial Investigation Report.

Blasland, Bouck & Lee, Inc., January 1996 (Revised August 1996). Addendum Remedial Investigation Report Area of Concern #5 LNAPL/DNAPL Investigation.
AECOM, February 2017 (Revised May 2017). Revised Conceptual Pilot Study Investigation Summary Report.

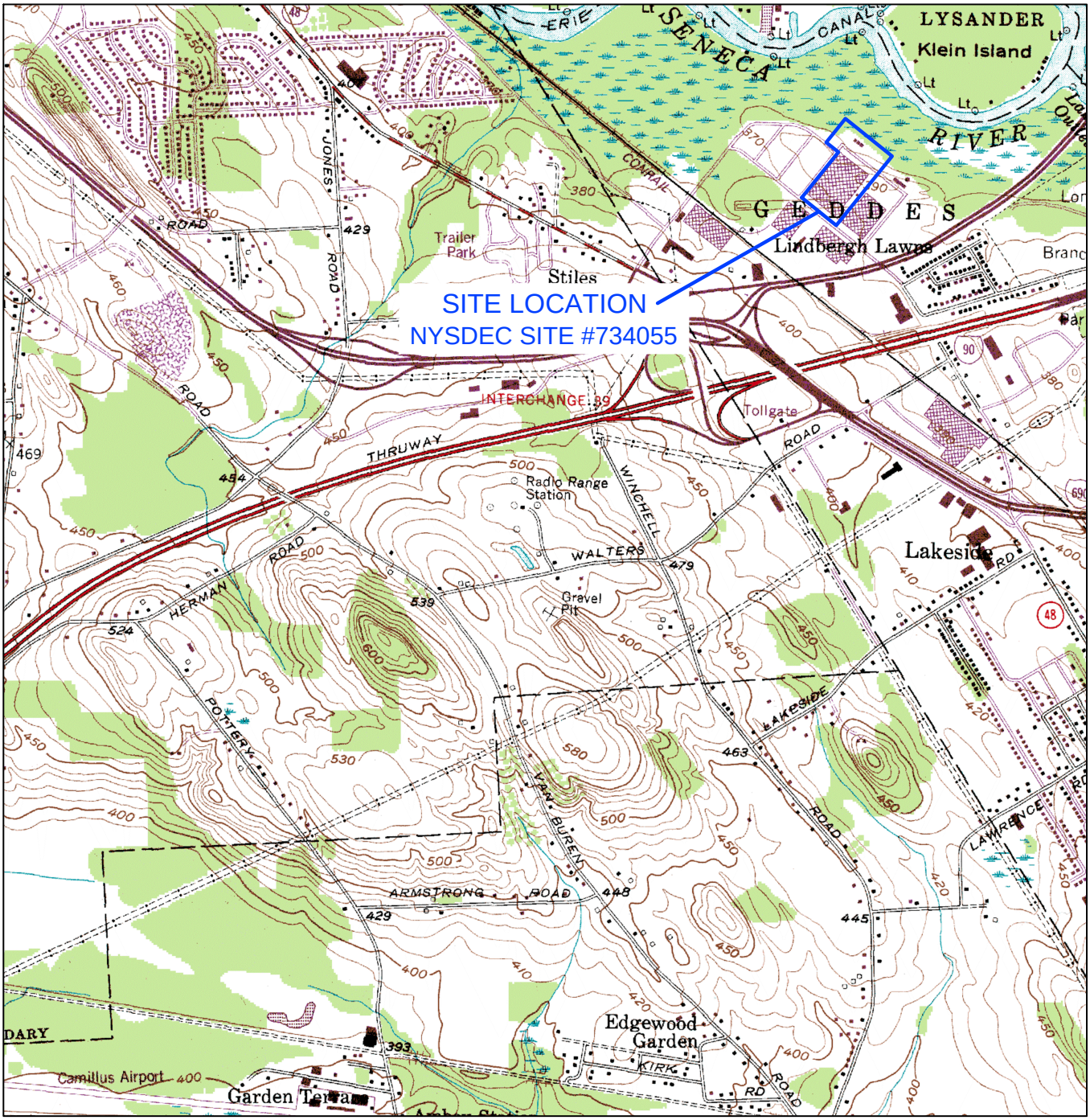
AECOM, July 25, 2017. Interim Site Management Report.

AECOM, April 26, 2018. In Situ Chemical Oxidation Pilot Test Summary Report.

AECOM, January 25, 2019. Fourth Quarter 2018 Groundwater Monitoring Report.

http://www.defiant-tech.com/pdfs/FROG-4000%20Product%20Brief3.pdf

FIGURES



NOTE: MAP DERIVED FROM U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, CAMILLUS, NY, DATED 1955, PHOTOREVISED 1978.

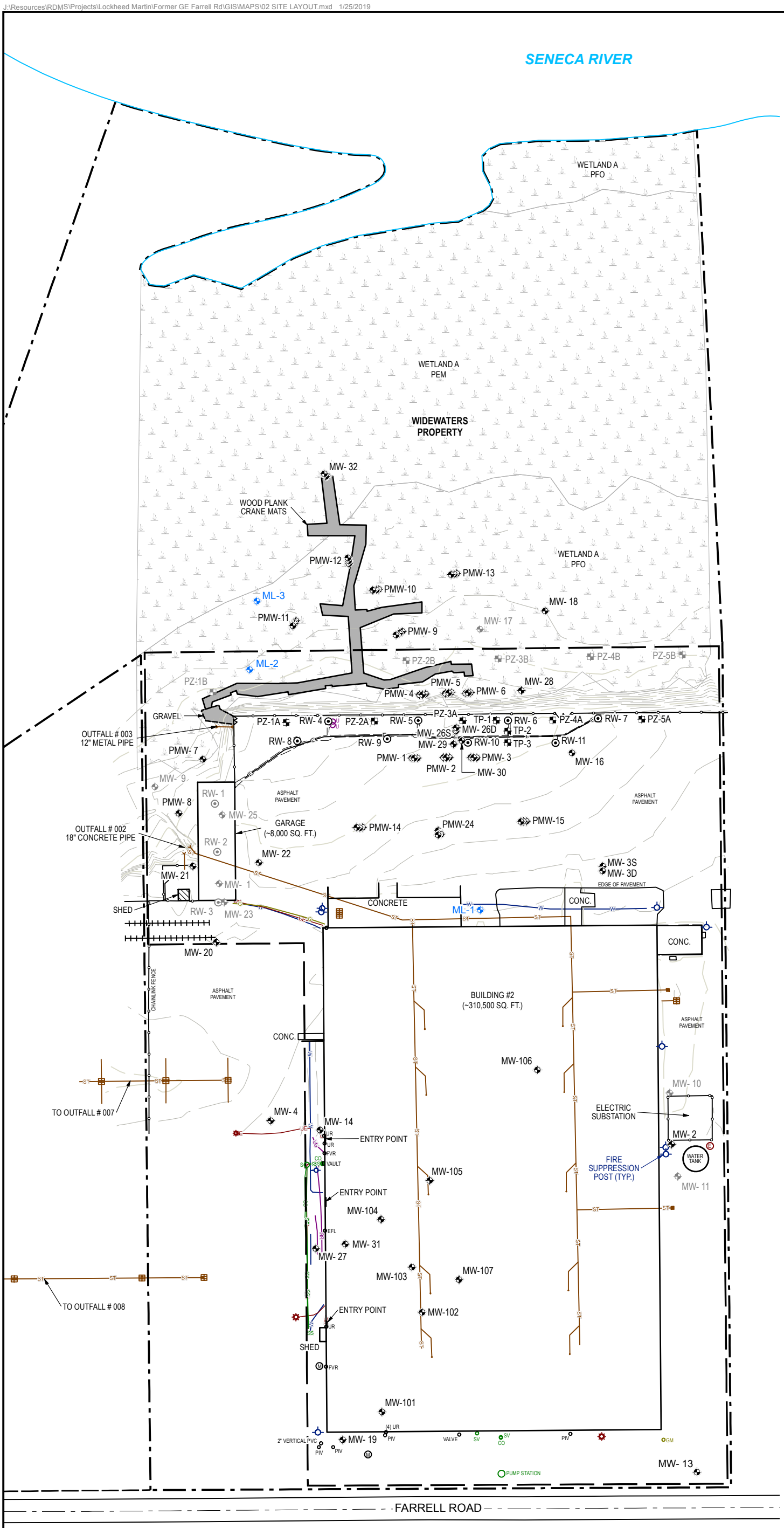
LOCKHEED MARTIN CORPORATION
FORMER G.E. FARRELL ROAD SITE
TOWN OF GEDDES, ONONDAGA COUNTY, NEW YORK
Project No.: 60518568 Date: NOVEMBER 23, 2016

SITE LOCATION MAP

AECOM

Figure: 1

J:\Resources\RDMS\Projects\Lockheed Martin\Former GE Farrell Rd\GIS\MAPS\02 SITE LAYOUT.mxd 1/25/2019



Legend

- Monitoring Well [1]
- Groundwater Extraction Well
- Continuous Multichamber Tubing (CMT) Well
- Piezometer
- Unknown Manhole
- Sanitary Manhole
- Sewer Vent/ Clean Out
- Catch Basin
- Gas Marker
- Electric Manhole
- Light Pole
- Fire Hydrant/ Fire Suppression Post
- Post Indicator Valve
- Manhole
- Former Vent Riser
- Utility Riser
- Sub-Slab Depressurization System Exhaust Fan Location
- 241 Farrell Road (16.6 acres) [2]
- Widewaters Property
- Trench Outline
- Topographic Contour
- Chainlink Fence
- Subgrade System Piping for the Groundwater Extraction Treatment System
- Sanitary Sewer Line
- Storm Sewer Line
- Underground Gas Line
- Underground Electric Line
- Underground Water Line
- Unknown Utility Line
- Lockheed Martin Storage Shed
- Area of Concern #5
- Wetland Construction Mat Access Road
- Delineated Wetland Area [3]

Notes:
1. PMW- 1 through PMW- 6, PMW- 9 through PMW-13, and PMW-24 are deep, intermediate, and shallow-screened sets of wells.
2. Site boundary as defined in April 26, 2012 NYSDEC correspondence (refer to Interim Site Management Plan, dated July 25, 2017).
3. Wetland areas were delineated in May 2017.
4. PEM = Palustrine Emergent
5. PFO = Palustrine Forested
6. Abandoned/ decommissioned wells are shown in gray. Locations were not surveyed and are approximate.

Reference:
Site layout based on survey information provided by CNY Land Surveying drawing, Farrell Road topographic survey and monitoring well locations, dated April 2, 2016.

LOCKHEED MARTIN CORPORATION
FORMER G.E. FARRELL ROAD SITE
TOWN OF GEDDES, ONONDAGA COUNTY, NEW YORK
Project No.: 60564181 Date: January 25, 2019

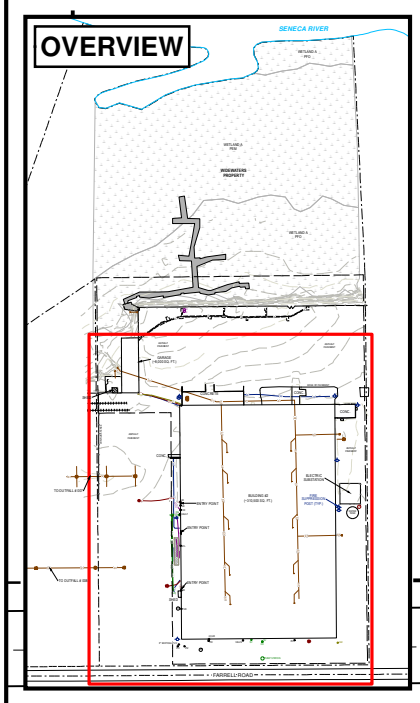
SITE LAYOUT MAP

AECOM
Figure: 2

J:\Resources\RDMS\Projects\Lockheed Martin\Former GE Farrell Rd\GIS\MAPS\SUBSURFACE INVESTIGATION WORK PLAN\03 HISTORICAL SAMPLE LOCATIONS.mxd 4/12/2019

Boring ID	Soil Sample Date	CVOCs (ppb)	BTEX (ppb)	Groundwater Sample Date	CVOCs (ppb)	BTEX (ppb)
BBL-1 (8-10')	9/25-27/95	ND	ND	--	--	--
BBL-1 (16-16.4')	9/25-27/95	ND	1 (J)	--	--	--
BBL-1 (22-24')	9/25-27/95	ND	2 (J)	--	--	--
BBL-2 (8-10')	9/25-27/95	3 (J)	ND	--	--	--
BBL-2 (14-16')	9/25-27/95	ND	ND	--	--	--
BBL-3 (8-10')	9/25-27/95	ND	ND	--	--	--
BBL-3 (12-14')	9/25-27/95	ND	2 (J)	--	--	--
BBL-3 (22-24')	9/25-27/95	ND	6 (J)	--	--	--
BBL-4 (12-14')	9/25-27/95	ND	889	--	--	--
BBL-4 (21-22')	9/25-27/95	17 (J)	12 (J)	--	--	--
BBL-5 (12-14')	9/25-27/95	ND	10 (J)	--	--	--
BBL-5 (24-26')	9/25-27/95	13 (J)	1 (J)	--	--	--
BBL-5 (28-30')	9/25-27/95	ND	2 (J)	--	--	--
B-11 (11')	1/22/92	26	ND	--	--	--
B-13 (6')	1/21/92	650,000	6,930,000	--	--	--
B-17 (10')	--	--	--	--	--	--
B-18 (6-8')	1/21/92	ND	6	--	--	--
B-31 (7')	2/3/92	30	ND	--	--	--
B-32	--	--	--	--	--	--
B-33 (9')	2/3/92	17,000	97,400	--	--	--
B-34	--	--	--	--	--	--
B-35 (5')	2/3/92	ND	10	--	--	--
B-36 (9')	2/3/92	140,000	2,160,000	--	--	--
B-37	--	--	--	--	--	--
B-38 (5')	2/3/92	14	5	--	--	--
B-39 (5')	2/3/92	ND	9	--	--	--
B-40 (8') B-40 (13')	2/3/92	35,600 ND	336,000 427,000	--	--	--
B-44 (6') B-44 (10')	3/16/92	23 1,300	ND ND	3/16/1992	34,100	768,600
B-45 (8')	3/12/92	80	0	3/13/92	1,310	7
B-46/MW-14 (8')	3/13/92	ND	ND	3/26/92	ND	ND
B-47 (9')	3/13/92	12,350	37,400	3/13/92	192,000	511,000
B-47A/MW-104 (9')	3/18/92	93	830	3/18/92	920	3,010
B-48 (1')	3/12/92	ND	ND	3/13/92	99	ND
B-49	--	--	--	--	--	--
B-50	--	--	--	--	--	--
B-52/MW-103 (8')	4/6/92	51	ND	4/6/92	64,220	155,880
B-53 (8')	4/25/92	6	ND	4/26/92	85,100	113,100
B-54 (4')	4/25/92	ND	ND	--	--	--
B-55 (8')	4/25/92	ND	ND	--	--	--
B-56/MW-101	--	--	--	4/30/92	37	ND
B-57 (7')	4/25/92	ND	ND	--	--	--
B-58 (4')	4/25/92	ND	ND	--	--	--
B-59 (7')	4/25/92	ND	ND	--	--	--
B-60/MW-102 (7')	4/25/92	ND	ND	4/30/92	474	ND
B-61/MW-107 (8')	4/26/92	8	ND	4/30/92	343	ND
B-62/MW-105 (7')	4/26/92	ND	ND	4/27/92	760	2,180
B-63 (8')	4/27/92	43	ND	--	--	--
B-65 (8')	4/27/92	43	ND	4/23/92	24,850	40,800
B-66 (8')	4/27/92	ND	ND	--	--	--
B-67 (1-3')	4/23/92	56	ND	4/24/92	270	ND
B-68 (8-10')	4/23/92	120	1,900	4/25/92	1,250	12,000
B-69 (8-10')	4/23/92	ND	ND	--	--	--
B-71 (15')	5/5/92	ND	ND	5/5/92	ND	ND
B-73 (4-6')	4/24/92	ND	ND	--	--	--
B-74 (7')	4/26/92	ND	ND	4/25/92	8	ND
B-75 (8-10')	4/23/92	7	74	4/23/92	50	4,860
B-76 (8-10')	4/23/92	2,855	225	4/23/92	3,530	60
B-77 (8')	4/27/92	ND	ND	4/27/92	11,900	24,700
B-78 (8')	4/27/92	ND	ND	--	--	--
B-79 (8.5')	4/27/92	ND	ND	--	--	--
B-81 (14')	5/5/92	ND	ND	5/5/92	ND	ND
B-82 (14')	5/5/92	ND	ND	5/5/92	ND	ND
B-84/MW-106	--	--	--	5/5/92	94	ND
B-85 (15')	4/29/92	ND	8	4/29/92	ND	8
B-86 (15')	5/6/92	11	ND	5/6/92	11	ND
B-106 (2-3')	11/1/93	NS	NS	--	--	--
B-106 (5-6')	11/1/93	NS	NS	--	--	--
B-107 (2-3')	10/28/94	NS	NS	--	--	--
B-107 (5-6')	10/28/94	NS	NS	--	--	--
B-114 (5-7')	5/4/94	ND	ND	--	--	--
B-114 (7-9')	5/4/94	ND	ND	--	--	--
B-120 (2-4')	4/26/94	ND	ND	--	--	--
B-122 (0-1')	10/28/93	NS	NS	--	--	--
B-123 (0-1')	10/28/93	NS	NS	--	--	--
B-129 (3-5')	5/5/94	ND	ND	--	--	--
B-129 (9-11')	5/5/94	ND	ND	--	--	--
B-130 (3-5')	5/4/94	ND	ND	--	--	--
B-130 (9-11')	5/4/94	ND	ND	--	--	--
B-131 (3-5')	5/4/94	ND	ND	--	--	--
B-131 (7-9')	5/4/94	ND	ND	--	--	--
B-132 (3-5')	5/5/94	ND	ND	--	--	--
B-132 (5-7')	5/5/94	ND	ND	--	--	--
MW-2	--	--	--	5/23/91	966	38
MW-3S	--	--	--	2/3/92	4,200	ND
MW-3D	--	--	--	3/26/92	297	ND
MW-4	--	--	--	2/3/92	4	ND
MW-13	--	--	--	5/23/91	ND	ND
MW-19	--	--	--	3/26/92	54	ND

NS - Not Sampled for Volatile Organic Compounds
-- indicates no sample date and no data
Boring locations are shown on figure highlighted in yellow



ASPHALT PAVEMENT
CONCRETE
CONC.
EDGE OF PAVEMENT
BUILDING #2 (~310,500 SQ. FT.)
ENTRY POINT
FORMER USTs
FORMER DRY WELL
SHED
ELECTRIC SUBSTATION
FIRE SUPPRESSION POST (TYP.)
WATER TANK
PUMP STATION
2" VERTICAL PVC
(4) UR
FARRELL ROAD

PMW-14 PMW-24 PMW-15 MW- 3S MW- 3D MW- 4 MW- 14 MW- 2 MW- 10 MW- 11 MW- 13 MW- 19
B-130 B-69 B-114 B-67 B-131 B-132 B-68 B-129 B-107 B- 79 B-106 B- 78 B- 50 B-122 B- 48 B-123 B- 49 B- 18 B- 17 B- 31 B- 37 B- 38 B- 36 B- 13 B- 39 B-47A/ MW-104 B-45 B- 40 B- 47 B-44 B-52/ MW-103 B- 46 B- 35 B- 34 B-53 B-120 B- 33 B-65 B-54 B- 59 B-55 B-57 B-58 B- 56/ MW-101 B-74 B- 73 B- 11 B- 84/ MW-106 B-85 B-71 B- 62/ MW-105 B-77 B- 63 B-81 B-82 B- 61/ MW-107 B-66 B- 60/ MW-102
SS-03 SS-04 SS-30 SS-29 SS-28 SS-22 SS-07 SS-06 SS-12 SS-13 SS-27 SS-14 SS-26 SS-20 SS-19 SS-21 SS-05 SS-15 SS-08 SS-16 SS-25 SS-24 SS-18 SS-10 SS-17 SS-09 SS-23

Legend

- Monitoring Well [1]
- Groundwater Extraction Well
- Continuous Multichamber Tubing (CMT) Well
- Piezometer
- Sub-Slab Soil Vapor
- Historic Soil Boring
- Historic LNAPL/DNAPL Investigation Soil Boring
- September 2002 Confirmatory Soil Sample (CSB-501 through CSB-518)
- Unknown Manhole
- Sanitary Manhole
- Sewer Vent/ Clean Out
- Catch Basin
- Gas Marker
- Electric Manhole
- Light Pole
- Fire Hydrant/ Fire Suppression Post
- Post Indicator Valve
- Manhole
- Former Vent Riser
- Utility Riser
- Sub-Slab Depressurization System Exhaust Fan Location
- Lockheed Martin Storage Shed
- 241 Farrell Road (16.6 acres) [2]
- Widewaters Property
- Topographic Contour
- Chainlink Fence
- SSDS System
- Subgrade System Piping for the Groundwater Extraction Treatment System
- Sanitary Sewer Line
- Storm Sewer Line
- Underground Gas Line
- Underground Electric Line
- Underground Water Line
- Unknown Utility Line

Notes:
1. PMW- 1 through PMW- 6, PMW- 9 through PMW-13, and PMW-24 are deep, intermediate, and shallow-screened sets of wells.
2. Site boundary as defined in April 26, 2012 NYSDEC correspondence (refer to Interim Site Management Plan, dated July 25, 2017).
3. Abandoned/ decommissioned wells are shown in gray. Locations were not surveyed and are approximate.
4. All historic locations are approximate.

Reference:
Site layout based on survey information provided by CNY Land Surveying drawing, Farrell Road topographic survey and monitoring well locations, dated April 2, 2016.

80 0 80 Feet

LOCKHEED MARTIN CORPORATION
FORMER G.E. FARRELL ROAD SITE
TOWN OF GEDDES, ONONDAGA COUNTY, NEW YORK
Project No.: 60598882 Date: April 12, 2019

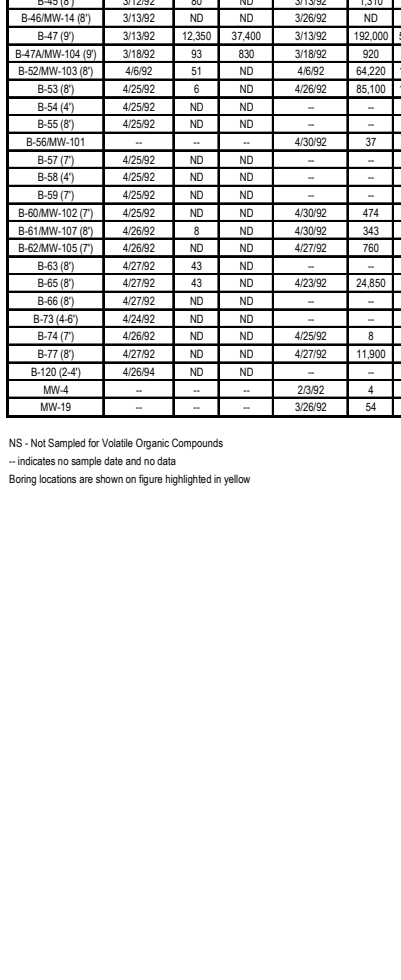
HISTORICAL SOIL AND GROUNDWATER SAMPLE LOCATIONS AND DATA IN VICINITY OF BUILDING #2

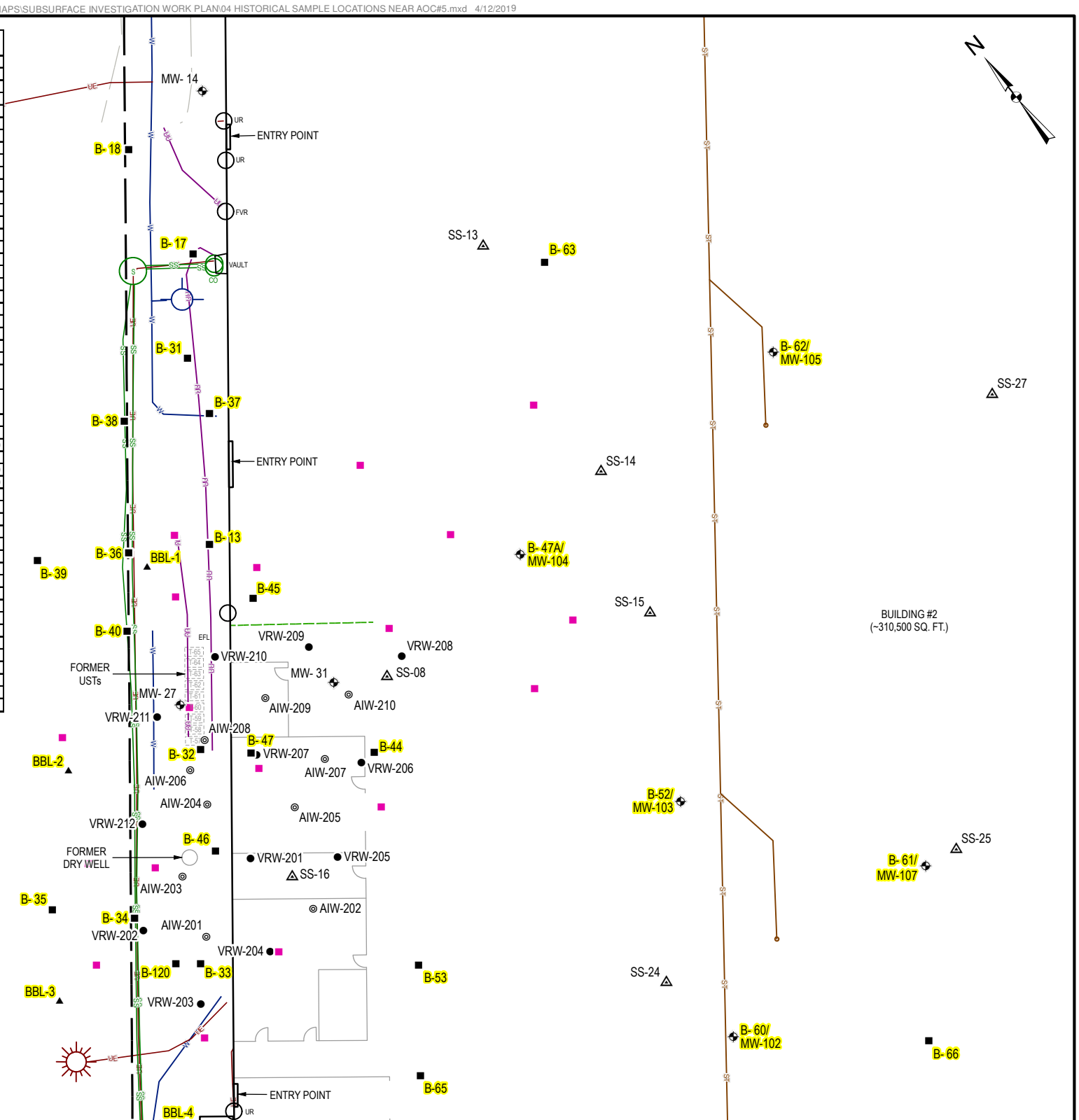
AECOM
Figure: 3

J:\Resources\RDMS\Projects\Lockheed Martin\Former GE Farrell Rd\GIS\MAPS\SUBSURFACE INVESTIGATION WORK PLAN\04 HISTORICAL SAMPLE LOCATIONS NEAR AOC#5.mxd 4/12/2019

Boring ID	Soil Sample Date	CVOCs (ppb)	BTEX (ppb)	Groundwater Sample Date	CVOCs (ppb)	BTEX (ppb)
BBL-1 (8-10')	9/25-27/95	ND	ND	--	--	--
BBL-1 (16-16.4')	9/25-27/95	ND	1 (J)	--	--	--
BBL-1 (22-24')	9/25-27/95	ND	2 (J)	--	--	--
BBL-2 (8-10')	9/25-27/95	3 (J)	ND	--	--	--
BBL-2 (14-16')	9/25-27/95	ND	ND	--	--	--
BBL-3 (8-10')	9/25-27/95	ND	ND	--	--	--
BBL-3 (12-14')	9/25-27/95	ND	2 (J)	--	--	--
BBL-3 (22-24')	9/25-27/95	ND	6 (J)	--	--	--
BBL-4 (12-14')	9/25-27/95	ND	889	--	--	--
BBL-4 (21-22')	9/25-27/95	17 (J)	12 (J)	--	--	--
BBL-5 (12-14')	9/25-27/95	ND	10 (J)	--	--	--
BBL-5 (24-26')	9/25-27/95	13 (J)	1 (J)	--	--	--
BBL-5 (28-30')	9/25-27/95	ND	2 (J)	--	--	--
B-13 (6')	1/21/92	650,000	6,930,000	--	--	--
B-17 (10')	--	--	--	--	--	--
B-18 (6-8')	1/21/92	ND	6	--	--	--
B-31 (7')	2/3/92	30	ND	--	--	--
B-32	--	--	--	--	--	--
B-33 (9')	2/3/92	17,000	97,400	--	--	--
B-34	--	--	--	--	--	--
B-35 (5')	2/3/92	ND	10	--	--	--
B-36 (9')	2/3/92	140,000	2,160,000	--	--	--
B-37	--	--	--	--	--	--
B-38 (5')	2/3/92	14	5	--	--	--
B-39 (5')	2/3/92	ND	9	--	--	--
B-40 (8') B-40 (13')	2/3/92	35,600 ND	336,000 427,000	--	--	--
B-44 (6') B-44 (10')	3/16/92	23 1,300	ND ND	3/16/1992	34,100	768,600
B-45 (8')	3/12/92	80	ND	3/13/92	1,310	7
B-46/MW-14 (8')	3/13/92	ND	ND	3/26/92	ND	ND
B-47 (9')	3/13/92	12,350	37,400	3/13/92	192,000	511,000
B-47A/MW-104 (9')	3/18/92	93	830	3/18/92	920	3,010
B-52/MW-103 (8')	4/6/92	51	ND	4/6/92	64,220	155,880
B-53 (8')	4/25/92	6	ND	4/26/92	85,100	113,100
B-54 (4')	4/25/92	ND	ND	--	--	--
B-55 (8')	4/25/92	ND	ND	--	--	--
B-56/MW-101	--	--	--	4/30/92	37	ND
B-57 (7')	4/25/92	ND	ND	--	--	--
B-58 (4')	4/25/92	ND	ND	--	--	--
B-59 (7')	4/25/92	ND	ND	--	--	--
B-60/MW-102 (7')	4/25/92	ND	ND	4/30/92	474	ND
B-61/MW-107 (8')	4/26/92	8	ND	4/30/92	343	ND
B-62/MW-105 (7')	4/26/92	ND	ND	4/27/92	760	2,180
B-63 (8')	4/27/92	43	ND	--	--	--
B-65 (8')	4/27/92	43	ND	4/23/92	24,850	40,800
B-66 (8')	4/27/92	ND	ND	--	--	--
B-73 (4-6')	4/24/92	ND	ND	--	--	--
B-74 (7')	4/26/92	ND	ND	4/25/92	8	0
B-77 (8')	4/27/92	ND	ND	4/27/92	11,900	24,700
B-120 (2-4')	4/26/94	ND	ND	--	--	--
MW-4	--	--	--	2/3/92	4	ND
MW-19	--	--	--	3/26/92	54	ND

NS - Not Sampled for Volatile Organic Compounds
-- indicates no sample date and no data
Boring locations are shown on figure highlighted in yellow





Legend

- Monitoring Well [1]
- Groundwater Extraction Well
- Continuous Multichamber Tubing (CMT) Well
- Piezometer
- Sub-Slab Soil Vapor
- Historic Soil Boring
- Historic LNAPL/DNAPL Investigation Soil Boring
- Historic Air Injection Well
- Historic Vapor Recovery Well
- September 2002 Confirmatory Soil Sample (CSB-501 through CSB-518)
- Unknown Manhole
- Sanitary Manhole
- Sewer Vent/ Clean Out
- Catch Basin
- Gas Marker
- Electric Manhole
- Light Pole
- Fire Hydrant/ Fire Suppression Post
- Post Indicator Valve
- Manhole
- Former Vent Riser
- Utility Riser
- Sub-Slab Depressurization System Exhaust Fan Location
- Lockheed Martin Storage Shed
- 241 Farrell Road (16.6 acres) [2]
- Widewaters Property
- Topographic Contour
- Chainlink Fence
- SSDS System
- Subgrade System Piping for the Groundwater Extraction Treatment System
- Sanitary Sewer Line
- Storm Sewer Line
- Underground Gas Line
- Underground Electric Line
- Underground Water Line
- Unknown Utility Line

Notes:
1. PMW- 1 through PMW- 6, PMW- 9 through PMW-13, and PMW-24 are deep, intermediate, and shallow-screened sets of wells.
2. Site boundary as defined in April 26, 2012 NYSDEC correspondence (refer to Interim Site Management Plan, dated July 25, 2017).
3. Abandoned/ decommissioned wells are shown in gray. Locations were not surveyed and are approximate.
4. All historic locations are approximate.

Reference:
Site layout based on survey information provided by CNY Land Surveying drawing, Farrell Road topographic survey and monitoring well locations, dated April 2, 2016.

35 0 35 Feet

LOCKHEED MARTIN CORPORATION
FORMER G.E. FARRELL ROAD SITE
TOWN OF GEDDES, ONONDAGA COUNTY, NEW YORK
Project No.: 60598882 Date: April 12, 2019

FOCUS VIEW OF HISTORICAL SOIL AND GROUNDWATER SAMPLE LOCATIONS AND DATA IN VICINITY OF AOC #5

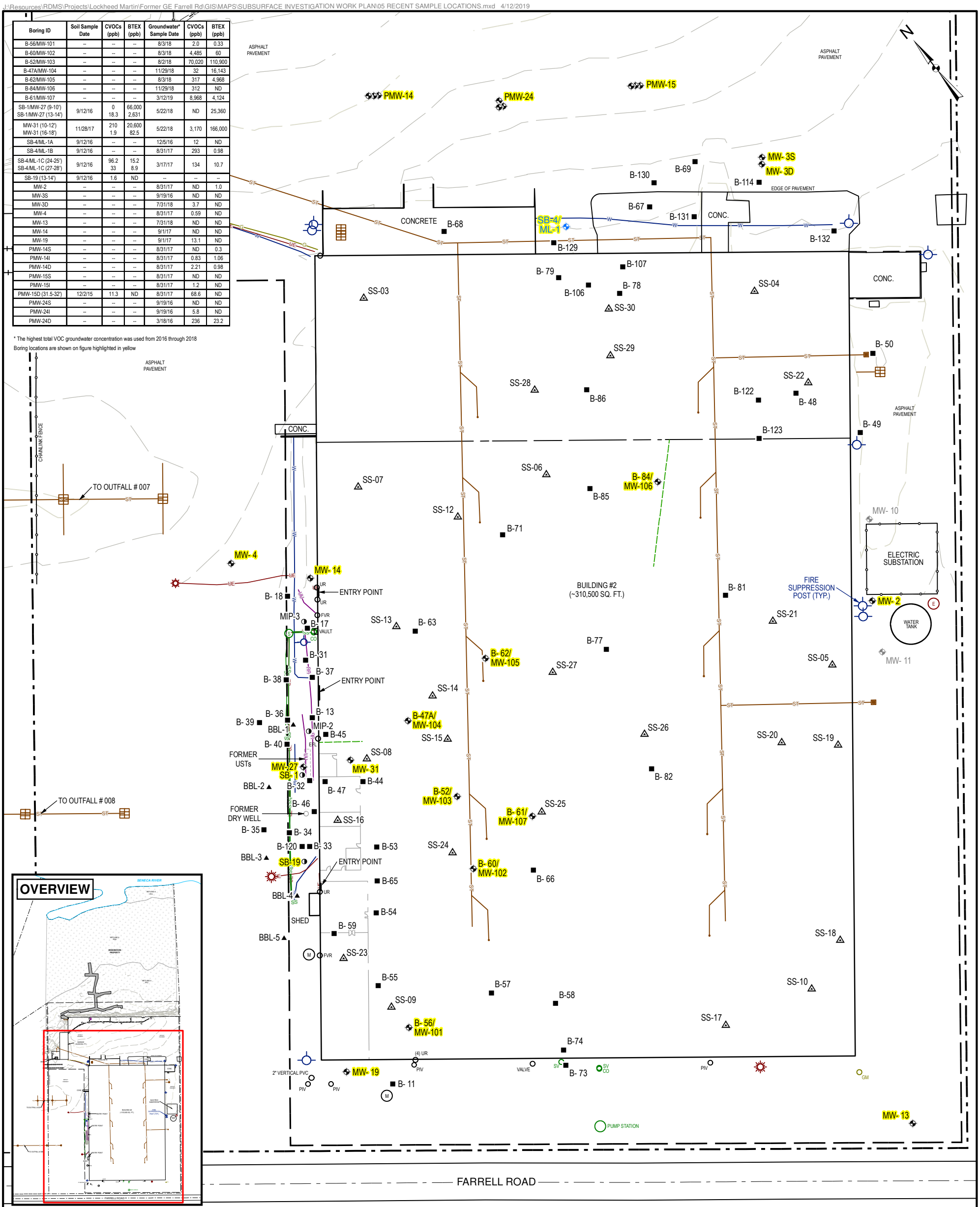
AECOM
Figure: 4

J:\Resources\RDMS\Projects\Lockheed Martin\Former GE Farrell Rd\GIS\MAPS\SUBSURFACE INVESTIGATION WORK PLAN\05 RECENT SAMPLE LOCATIONS.mxd 4/12/2019

Boring ID	Soil Sample Date	CVOCs (ppb)	BTEX (ppb)	Groundwater* Sample Date	CVOCs (ppb)	BTEX (ppb)
B-56/MW-101	--	--	--	8/3/18	2.0	0.33
B-60/MW-102	--	--	--	8/3/18	4,485	60
B-52/MW-103	--	--	--	8/2/18	70,020	110,900
B-47A/MW-104	--	--	--	11/29/18	32	16,143
B-62/MW-105	--	--	--	8/3/18	317	4,968
B-84/MW-106	--	--	--	11/29/18	312	ND
B-61/MW-107	--	--	--	3/12/19	8,968	4,124
SB-1/MW-27 (9-10') SB-1/MW-27 (13-14')	9/12/16	0 18.3	66,000 2,631	5/22/18	ND	25,360
MW-31 (10-12') MW-31 (16-18')	11/28/17	210 1.9	20,600 82.5	5/22/18	3,170	166,000
SB-4/ML-1A	9/12/16	--	--	12/5/16	12	ND
SB-4/ML-1B	9/12/16	--	--	8/31/17	293	0.98
SB-4/ML-1C (24-25') SB-4/ML-1C (27-28')	9/12/16	96.2 33	15.2 8.9	3/17/17	134	10.7
SB-19 (13-14')	9/12/16	1.6	ND	--	--	--
MW-2	--	--	--	8/31/17	ND	1.0
MW-3S	--	--	--	9/19/16	ND	ND
MW-3D	--	--	--	7/31/18	3.7	ND
MW-4	--	--	--	8/31/17	0.59	ND
MW-13	--	--	--	7/31/18	ND	ND
MW-14	--	--	--	9/1/17	ND	ND
MW-19	--	--	--	9/1/17	13.1	ND
PMW-14S	--	--	--	8/31/17	ND	0.3
PMW-14I	--	--	--	8/31/17	0.83	1.06
PMW-14D	--	--	--	8/31/17	2.21	0.98
PMW-15S	--	--	--	8/31/17	ND	ND
PMW-15I	--	--	--	8/31/17	1.2	ND
PMW-15D (31.5-32')	12/2/15	11.3	ND	8/31/17	68.6	ND
PMW-24S	--	--	--	9/19/16	ND	ND
PMW-24I	--	--	--	9/19/16	5.8	ND
PMW-24D	--	--	--	3/18/16	236	23.2

* The highest total VOC groundwater concentration was used from 2016 through 2018

Boring locations are shown on figure highlighted in yellow



Legend

- Monitoring Well [1]
- Groundwater Extraction Well
- Continuous Multichamber Tubing (CMT) Well
- Piezometer
- Sub-Slab Soil Vapor
- Historic Soil Boring
- Historic LNAPL/DNAPL Investigation Soil Boring
- Membrane Interface Probe Location
- Unknown Manhole
- Sanitary Manhole
- Sewer Vent/ Clean Out
- Catch Basin
- Gas Marker
- Electric Manhole
- Light Pole
- Fire Hydrant/ Fire Suppression Post
- Post Indicator Valve
- Manhole
- Former Vent Riser
- Utility Riser
- Sub-Slab Depressurization System Exhaust Fan Location
- Lockheed Martin Storage Shed
- 241 Farrell Road (16.6 acres) [2]
- Widewaters Property
- Topographic Contour
- Chainlink Fence
- SSDS System
- Subgrade System Piping for the Groundwater Extraction Treatment System
- Sanitary Sewer Line
- Storm Sewer Line
- Underground Gas Line
- Underground Electric Line
- Underground Water Line
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Notes:
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4. All historic locations are approximate.

Reference:
Site layout based on survey information provided by CNY Land Surveying drawing, Farrell Road topographic survey and monitoring well locations, dated April 2, 2016.

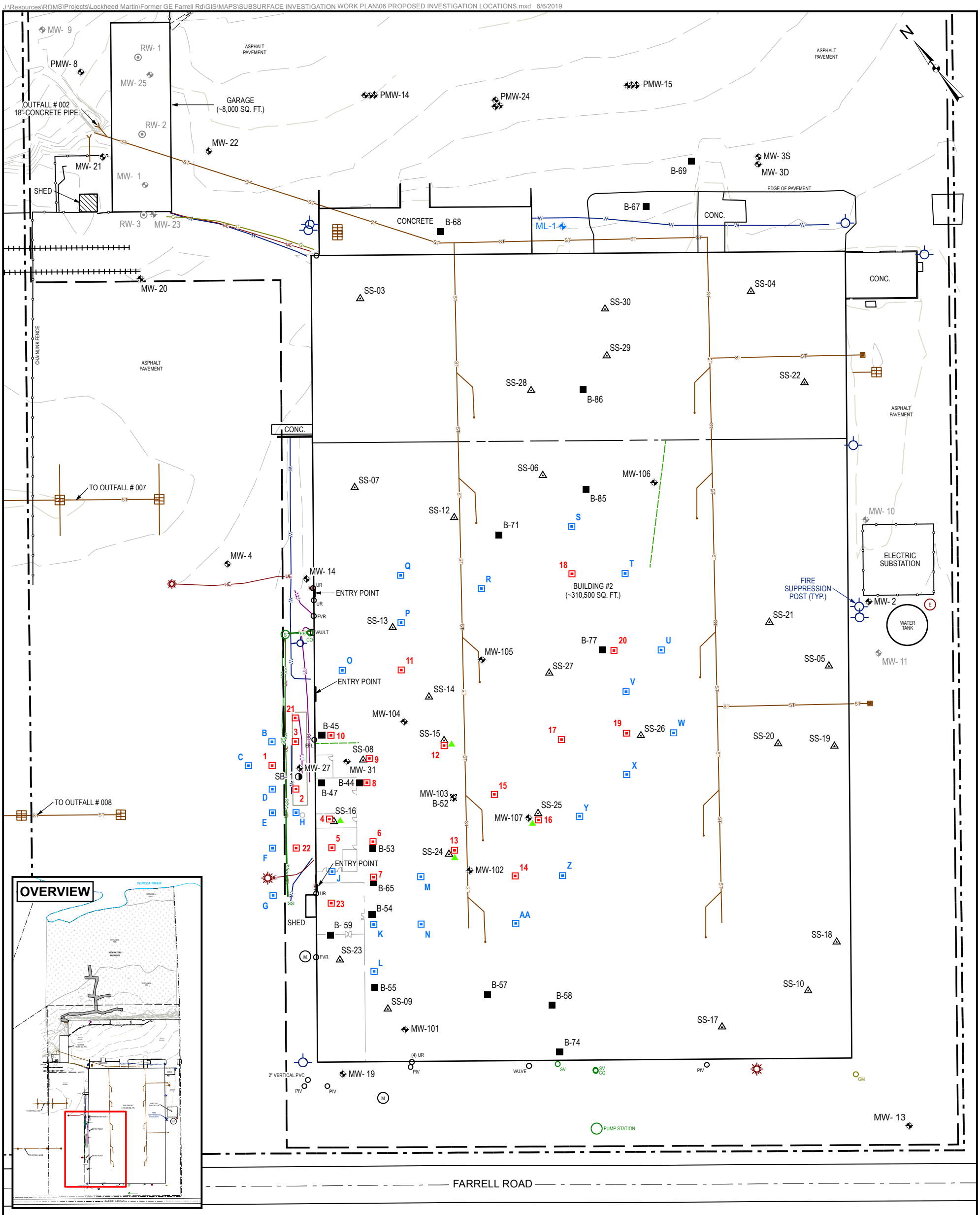
80 0 80 Feet

LOCKHEED MARTIN CORPORATION
FORMER G.E. FARRELL ROAD SITE
TOWN OF GEDDES, ONONDAGA COUNTY, NEW YORK
Project No.: 60598882 Date: April 12, 2019

RECENT SOIL AND GROUNDWATER SAMPLE LOCATIONS AND DATA IN VICINITY OF BUILDING #2

AECOM
Figure: 5

J:\Resources\RDMS\Projects\Lockheed Martin\Former GE Farrell Rd\GIS\MAPS\SUBSURFACE INVESTIGATION WORK PLAN\06 PROPOSED INVESTIGATION LOCATIONS.mxd 6/6/2019



Legend

- Proposed Soil and Groundwater Investigation Location
- Contingent Soil and Groundwater Investigation Location
- Proposed Soil Vapor Point (4' and 8')
- Monitoring Well [1]
- Groundwater Extraction Well
- Continuous Multichamber Tubing (CMT) Well
- Piezometer
- Historical Data Collection Point
- Sub-Slab Soil Vapor
- Membrane Interface Probe Location
- Unknown Manhole
- Sanitary Manhole
- Sewer Vent/ Clean Out
- Catch Basin
- Gas Marker
- Electric Manhole
- Light Pole
- Fire Hydrant/ Fire Suppression Post
- Post Indicator Valve
- Manhole
- Former Vent Riser
- Utility Riser
- Sub-Slab Depressurization System Exhaust Fan Location
- Lockheed Martin Storage Shed
- 241 Farrell Road (16.6 acres) [2]
- Widewaters Property
- Topographic Contour
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- SSDS System
- Subgrade System Piping for the Groundwater Extraction Treatment System
- Sanitary Sewer Line
- Storm Sewer Line
- Underground Gas Line
- Underground Electric Line
- Underground Water Line
- Unknown Utility Line

Notes:
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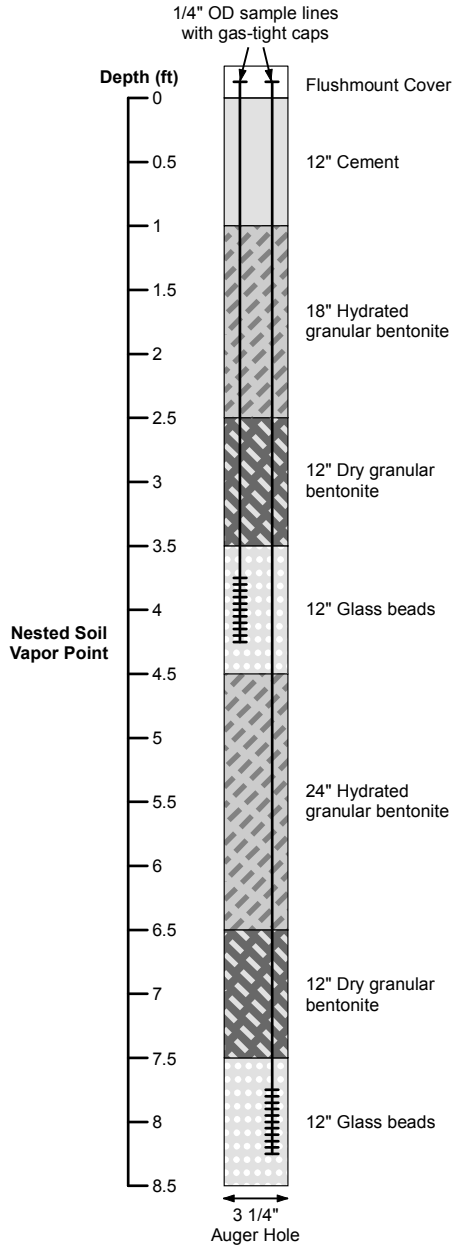
Site layout based on survey information provided by CNY Land Surveying drawing, Farrell Road topographic survey and monitoring well locations, dated April 2, 2016.

80 0 80 Feet

LOCKHEED MARTIN CORPORATION
FORMER G.E. FARRELL ROAD SITE
TOWN OF GEDDES, ONONDAGA COUNTY, NEW YORK
Project No.: 60598882 Date: June 6, 2019

PROPOSED INVESTIGATION LOCATIONS IN VICINITY OF BUILDING #2

AECOM
Figure: 6



Note:
This is a generic illustration of the nested soil vapor point design. Actual design may vary slightly based on field conditions.

LOCKHEED MARTIN CORPORATION
FORMER G.E. FARRELL ROAD SITE
TOWN OF GEDDES, ONONDAGA COUNTY, NEW YORK
Project No.: 60598882 Date: April 18, 2019

NESTED SOIL VAPOR POINT INSTALLATION DESIGN

AECOM
Figure: 7

ATTACHMENT A

STANDARD OPERATING PROCEDURES

Volatile Organic Compound Screening Using FROG 4000

Standard Operating Procedure – VOC Screening using FROG 4000

Project Scope: Provide real-time field data using a hand-held chromatograph (FROG-4000™) to analyze samples. The Frog-4000 data will be used to assist in delineating volatile organic compound (VOC) impacted soil and groundwater. Soil borings will be advanced to a terminal depth of top of till, which expected to be approximately 18 feet, at each location.

Equipment/Materials:

- Calibrated FROG-4000™ Portable GC System (note that the rechargeable battery provides 8 hours of usage in standard temperature conditions)
- *FROG-4000™ Quick Start Guide*
- Computer with Ellvin Windows software installed
- Calibrated Handheld PID with 10.6 electronvolt (eV) bulb
- Ziploc® Bags, or similar
- Tape measure or folding carpenter's rule
- Distilled or deionized (DI) water
- Portable analytical balance that can read 0.01 gram
- Laboratory-grade methanol
- Spatula or small spoon
- 10 - 100 microliter (µL) pipette

Stage 1. VOC Screening in Headspace using PID

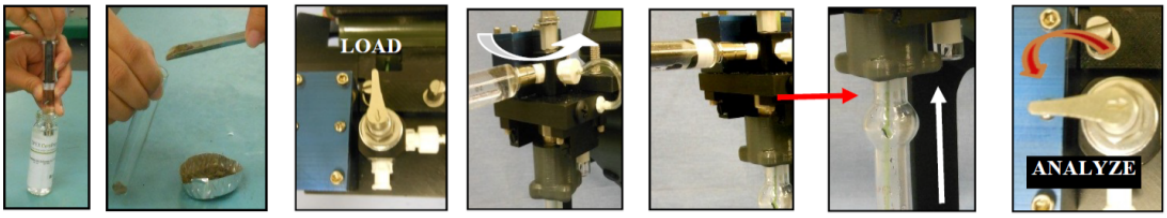
1. At each boring location, soil samples will be collected in 1 foot intervals and placed in Ziploc™ bags. Photoionization detector (PID) readings will be measured through a small opening in the top of the bag. Record PID readings in field notes/log.
2. If a PID reading is greater than 100 parts per million (ppm), a methanol dilution will likely be necessary for VOC analysis using the Frog-4000™.

Stage 2. Purge-and-trap for VOC analysis in soil

<u>Stage 2A. Low Concentrations (VOCs < 200 µg/kg) PID < 50 ppm</u>

Detection Limit = 100 ppb for BTEX, TCE

1. Remove soil from a select 1 foot interval of a core where VOC analysis is desired. Place 1 gram of soil directly into the sparge tube using a spatula or small spoon (1).
2. Place the load/analyze valve in the LOAD position (2).
3. Slip bottle over green tube/sparge needle (3a).
4. Fill syringe with 5 milliliter (mL) of deionized water and add water to sparge bottle.
5. Attach sparge bottle in UP position and tighten the sparge bottle nut counter clockwise. (3b-4)
6. Place the load/analyze valve into the ANALYZE position (5).



7. Instrument screen should read "READY", Record Log # in field notes/field log, press "START" button.
8. Chromatogram should be displayed on screen. Readings are shown in micrograms per liter (µg/L). Multiply the reading by 5 to obtain results in micrograms per kilogram (µg/kg).
9. Empty the sparge bottle and run a clean water blank between each analysis.

Note: If the VOC concentration in the soil sample is too high for the instrument to measure, you will see a plateau on the chromatogram (see **Figure 1** below). The longer the plateau, the more contamination is present. You will need to re-run the analysis using a diluted sample (see **Stage 2B** below for running dilutions). If greater VOC concentrations are detected, multiple clean water blank runs may need to be performed to clean out the system. Note each FROG-4000 run takes approximately 8 minutes.

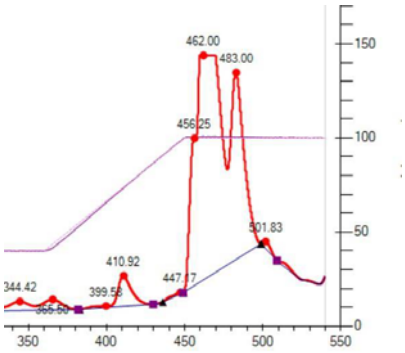


Figure 1: A plateau on the chromatogram indicates VOC concentrations are too high for the sensitivity of the sensor.

Stage 2B. High concentrations (VOCs > 200 ppb) PID> 50 ppm

When dilution is necessary (i.e. PID > 50 ppm), start with a large dilution and work your way to a more concentrated sample. Use **Table 1** below to determine the injection volume necessary for analysis. *Historical soil data indicates that a 1,000x dilution should be the largest dilution necessary to obtain valid results.*

1. Add 10 mL of methanol to a 20 mL VOA vial and cap the vial.
2. Determine the mass of the vial with methanol using an analytical balance.
3. Add 5 grams of soil to the vial.
4. Weigh the vial with soil to verify that 5 grams of soil was added.
5. Gently shake the vial for 2 minutes and allow to rest so that the solid separates from the methanol.
6. Using the pipette draw and inject the recommended volume (**Table 1**) of methanol extract into 5 mL of DI/distilled water.
7. Follow Step 4 through 6 from **Stage 2A.**
8. Readings are shown in µg/L. Multiply the reading by the corresponding dilution factor (DF) in **Table 1** to obtain results in µg/kg.
9. Run a clean water blank between each analysis.
10. If the chromatogram spikes displayed are very low and/or not present, a sample with a lower dilution should be run.

Table 1: Injection Volume for Analysis

Approximate Concentration Range	Volume of Methanol Extract Injected in 5 mL clean water	DF, Dilution Factor to adjust for sample dilution
500 – 10,000 µg/kg	100 µL	100
1,000 – 20,000 µg/kg	50 µL	200
5,000 – 100,000 µg/kg	10 µL	1000
25,000 – 500,000 µg/kg	100 µL after 50:1 dilution of extract	5000
$DF = \frac{5\ g\ H_2O}{5\ g\ soil} \cdot \frac{10\ mL\ solv.}{V_{extr.}(\mu L)} \cdot \frac{1000\ \mu L}{mL} \cdot \frac{1\ L\ H_2O}{1\ kg\ H_2O}$		

Stage 3. Purge-and-trap for VOC analysis in groundwater

Stage 3A. Low Concentration - No Dilution

1. Following completion of soil sampling, install a temporary monitoring point or use a Geoprobe® rod with sampling tip to collect groundwater sample.
2. Using a peristaltic pump collect groundwater sample from the temporary point. The sample should be collected in a clean VOA vial (without preservative) after purging the groundwater for a minimum of 15 minutes.
3. Using the syringe, remove 5 mL of groundwater from the VOA vial.
4. Place the load/analyze valve in the LOAD position.
5. Slip bottle over green tube/sparge needle.
6. Add groundwater to sparge bottle.
7. Attach sparge bottle in UP position and tighten the sparge bottle nut counter clockwise.
8. Place the load/analyze valve into the ANALYZE position.
9. Instrument screen should read “READY”, Record Log # in field notes/field log, press “START” button.
10. Chromatogram should be displayed on screen. Readings are shown in µg/L.
11. Empty the sparge bottle and run a clean water blank between each analysis.
    Note: If the VOC concentration in the groundwater sample is too high for the instrument to measure, you will see a plateau on the chromatogram (see **Figure 1** above). The longer the plateau, the greater concentration of VOC is present. You will need to re-run the analysis using a diluted sample.

Stage 3B. High Concentration

1. Follow Step 1-2 from Stage 3A.
2. Using syringe, remove 5 ml of clean DI water
3. Place the load/analyze valve in the LOAD position.
4. Slip bottle over green tube/sparge needle.
5. Add the 5 ml of DI to sparge needle
6. Using pipette extract 10 to 100 µL of groundwater from VOA vial into the sparge bottle.
7. Complete Steps 7-11 from Stage 3A.
8. Apply Dilution Factor to results and record.

    - 10 µL sample into 5 mL DI, DF = 500
    - 50 µL sample into 5 mL DI, DF= 100
    - 100 µL sample into 5 ml DI, DF= 50

Well Development
Standard Operating Procedure

Background

The purpose of groundwater well development is to:

- Remove any drilling fluids (water or mud) introduced into the aquifer during drilling;
- Remove any accumulated silt introduced into the sand filter pack as part of general well maintenance;
- Stabilise the sand filter pack; and/or
- Ensure groundwater obtained during sampling events is representative of groundwater from the aquifer.

Well development should be vigorous enough to ensure these objectives are met, but not so vigorous as to cause any damage to the borehole or the well construction.

Groundwater well development should be undertaken as soon as practical following well installation i.e. once grout has set (no sooner than 24 hours after well installation).

Procedure

Begin by measuring the depth to water (DTW), depth to bottom (DTB) and calculate the necessary purge volume based on the diameter of the well casing, DTW and DTB. All measured information should be recorded on the attached form.

Use a surge block and surging technique e to create a strong inward and outward movement of groundwater through the well screen, through the sand pack, and into the formation. The surge block is a plunger-like tool consisting of leather or rubber discs sandwiched between steel or wooden discs that may be solid or valved.

Surging will be alternated with groundwater extraction using a peristaltic pump and polyethylene tubing to extract groundwater from the well. Field parameters including pH, temperature, turbidity, dissolved oxygen (DO), oxidation-reduction potential (ORP) and specific conductivity will be measured during groundwater extraction using a calibrated multi-parameter water quality meter and recorded during purging until each reading stabilizes. Stabilization is achieved when three consecutive readings are within 3% for temperature, ± 0.1 unit for pH, 3% for SC, 10% for DO if greater than 0.5 milligrams per liter (mg/L) or three consecutive readings with less than 0.5 mg/L, and ± 10 millivolts for ORP. Parameters will be recorded on a Groundwater Well Field Parameter Form (**Attachment A**). All generated purge water will be contained in 55-gallon drums and staged in the remediation equipment shed for handling and disposal at a Lockheed Martin approved disposal facility.

If the well does not have sufficient water to surge block or if recharge rate is extremely slow, with approval required from the NYSDEC project manager, potable water may be added. However, if potable water is added, ensure that at least three well volumes are extracted from the well to ensure capture of the well only contains native groundwater. Record the final DTB and total amount of water removed from the well.

Following completion of well development, properly decontaminate all tools to prevent cross contamination between wells.

Well Development
Standard Operating Procedure

Background

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Following completion of well development, properly decontaminate all tools to prevent cross contamination between wells.

Attachment A

Groundwater Well Field Parameter Form

LOCKHEED MARTIN CORPORATION
Monitoring Well Parameter Form
241 Farrell Road, Syracuse, New York

Well Designation: _____ Contractor: AECOM

Date: _____ (month/day/year) Name(s) of Sampler(s): _____

DTW (ft):	
Water Column (WC) = DTB-DTW (ft):	
Well Volume (WC x **) (gallons):	

DTB (ft) BEFORE Purging:	
DTB (ft) AFTER Purging:	
Purge Volume (gallons):	

Time	Parameters					
	pH	Temp (^{0}C)	Turbidity	SC (mS/cm)	DO (mg/L)	ORP (mV)

DTB - depth to bottom
DTW - depth to water
SC - specific conductivity
DO - dissolved oxygen
ORP - oxygen reduction potential

Sample Taken? Y N

Sample Time: _____

Sample ID: _____

Duplicate ID: _____

Additional Notes:

**Volume Factors $^3/_8$-inch well = 0.006 gal/ft
$^3/_4$-inch well = 0.023 gal/ft
2-inch well = 0.163 gal/ft
4-inch well = 0.653 gal/ft
6-inch well = 1.468 gal/ft

AECOM

Geoprobe® Screen Point 22 Groundwater Sampler
Standard Operating Procedure
Technical Bulletin No. MK3173
Prepared: April 2010

Available at: https://geoprobe.com/literature/sp22-groundwater-sampler-sop

Lockheed Martin Corporation

241 Farrell Road, Geddes, NY

Guidance for Dust Control During Concrete Coring and Drilling Activities Inside Building #2

To control airborne dust during general housekeeping activities inside the building a sweeping compound, Clean Sweep Oil Base With Grit, will be applied over the areas where sweeping will occur. The SDS will be on site with the site specific Health and Safety Plan. The applied sweeping compound will be swept up and disposed of in conjunction with waste that has been generated during drilling activities.

Dust suppression and monitoring will be implemented during concrete coring activities by one or more of the following:

1. The use of wet cutting techniques (water applied to drill as it advances);
2. The use of a shop vac with an attached HEPA filter near the core drilling location;
3. Opening of over-head and/or man-doors on opposite ends of the building for cross-ventilation;
4. Incorporate the use of vent piping and in-line blowers to control exhaust from the drill rig (powered by a generator that will be staged outdoors);
5. Dust Trak monitors will be placed in pre-determined areas dependent on air flow direction and drilling location within the building (the Dust Trak monitors will be in use the day prior to work beginning to collect background data for a point of comparison as there is other work occurring unrelated to the core drilling)

Hazards and mitigations associated with the above:

1. Slips/falls on wet concrete floor ~~ ensure adequate lighting; avoid excess spraying of water/pressure; keep all non-essential personnel out of the immediate area; ensure footwear has sufficient tread to aide in moving around the area of drilling; clean up any excess water as soon as possible.
2. Exposure to loud noise from vacuum/falls from tripping on electrical cord/back-muscle strain-sprain ~~ Ensure hearing protection is donned, have all non-essential personnel stay a minimum of 20 feet away during operations, keep electrical cords neatly lined up and out of the path of walkways, do not bend or twist at the waist-bend at the knees-avoid over-reaching when using shop vac-move the shop vac along as you go.
3. Third party persons entering work area; Place cones/warning signs/tape at the entrances to alert third party and other contractors to the additional work being conducted inside the building; if equipped, use the electrical switch to open and close the overhead doors-if not equipped with electrical switch slowly open/close the doors using the pull-chain or manual handle, avoiding excessive pulling/over-reaching; don leather gloves.

4. Falls from tripping on electrical cord going from the generator (which will be staged and secured outside the building) to the ventilation fan; Inadvertent inhalation of dust/fumes/particles being removed by the vent fan ~~ keep all cords in a straight line, to one side, with cones or caution tape marking the cords, keep excess cord coiled up and placed out of walk/travel paths; avoid standing downwind of the vent fan, ensure eye protection is donned, have dust masks in immediate area.

5. Damage to the meters; injury to hands/fingers from cover accidentally closing ~~ Pre-determine placement of Dust Trak monitors, securely/evenly set up tripods out of paths of travel to avoid contact and potential damage to the meters; ensure the cover is closed and secured to the tripod; don leather gloves and keep hands/fingers out of the way when closing the lids on the cases.

Lockheed Martin Corporation

241 Farrell Road, Geddes, NY

Guidance for Exposure to Noise During Concrete Coring/Drilling/Hammer Advancement Activities Inside Building #2

At the beginning of investigation activities, the Site-Specific Hearing Conservation Program form will be completed. At the start of each work day, the attached Sound Level Survey form will be initiated and maintained throughout the work shift.

In accordance with the United States Department of Labor: www.OSHA.gov/SLTC/noisehearingconservation/standards

*The Occupational Safety and Health Administration's (**OSHA's**) **Noise standard** (29 CFR 1910.95) requires employers to have a hearing conservation program in place if workers are **exposed** to a time-weighted average (TWA) **noise** level of 85 decibels (dBA) or higher over an 8-hour work shift.*

***OSHA** sets legal **limits on noise exposure** in the workplace. These **limits** are based on a worker's time weighted average over an 8 hour day. With **noise**, **OSHA's** permissible **exposure limit** (**PEL**) is 90 dBA for all workers for an 8 hour day.*

OSHA allows 8 hours of exposure to 90 dBA but only 2 hours of exposure to 100 dBA sound levels. NIOSH would recommend limiting the 8 hour exposure to less than 85 dBA. At 100 dBA, NIOSH recommends less than 15 minutes of exposure per day.

In order to evaluate noise levels generated during typical expected activities during subsurface investigation work (i.e, concrete coring, drilling, hammer use during sample advancement), AECOM will monitor noise levels within the building for the duration of each work day.

At the start of each work day, a SoundPro™ DL (or similar) will be stationed in areas where other tenant personnel are working inside of Building #2.

The meters will be checked at 15 minute intervals. If tasks being conducted by others increase while AECOM is completing their work, the frequency of meter readings will be re-visited, and this guidance will be modified as appropriate.

If noise levels exceed the PEL of 90 dBA consistently, work will cease, and the area will be re-evaluated for other hearing delineation/protection options. This could include providing additional hearing protection such as ear muffs to all personnel, or erect noise curtains if feasible.

As an added precaution, signs will be posted at all entrances accessible to AECOM that indicates “Hearing Protection Required”.

Americas

Site-Specific Hearing Conservation Program

S3AM-118-FM1

Site (Project): _____ **Location :** _____

This program developed by:	Date:
Description of noise monitoring to be conducted (refer to *S3AM-118-FM2 Sound Level Survey* and *S3AM-118-FM3 Noise Dosimetry Report*) :	
Such monitoring will consist of (*check those that apply*): ☐ Noise Dosimetry ☐ Sound Level Meter Survey	

Monitoring

Specific instrumentation to be used is (make/model):

Make	Model
and will be calibrated at a frequency of _____ and documented in the _____.	

Monitoring strategy is as follows (*list all equipment and activities on site that may involve sound pressure levels above 80 dBA and an explanation of the strategy to document actual exposures*):

Area/Equipment	Monitoring Strategy

Where areas or equipment are not clearly identified, all monitoring will be documented utilizing an illustrated layout (*attach illustration developed for the specific site*). Monitoring frequency will be in accordance with the strategy outlined above and when the following changes in site conditions/activities occur:

1.
2.
3.
4.
5.

Employee Notification

All site employees exposed above the regulated action level of _____ dBA will be notified of the monitoring results by (*insert name/title*) _____ at an interval not to exceed _____ after completion of monitoring.

Notification shall be written, with a copy to the SH&E Department. Documentation of employee notifications and corresponding signatures of notified employees will be kept in the site health and safety logbook/files.

Observation of Monitoring

All employees affected by the monitoring, or a designated employee representative, shall be given the opportunity to observe noise monitoring procedures. This will be achieved by:

Audiometric Testing Program and Requirements

AECOM employees who perform field activities where noise exposure above action levels is expected are required to participate in an audiometric testing program. Additionally, any subcontractors performing work on AECOM projects where noise levels exceeding action level will be required to provide documentation that they participate in an audiometric testing program that meets the applicable regulations. Documentation of participation in the testing program will be maintained by _____ and will be located at _____.

Hearing Protectors and Estimating Attenuation

A selection of suitable hearing protectors will be made available to all employees who are expected to have 8-hour TWA noise exposures above dBA. The types anticipated to be available include:

Protection Type	Attenuation

Hearing protector attenuation will be evaluated by (*insert name/title*) for specific noise environments according to the following method prior to determining their suitability for use:

1.
2.
3.

The following employees will be required to wear hearing protectors during specific activities according to the results of site-specific monitoring conducted in accordance with this procedure. (This section can be completed after monitoring, if necessary).

Employee Name	Activity Type	Type of Protection

As applicable, hearing protectors will be properly fitted by _____ upon initial distribution to site workers.

Training in the use and care of hearing protectors shall be conducted by _____ during the initial site-specific health and safety training. Training contents shall meet the requirements set forth in this procedure and the applicable regulations.

Hearing protectors will be distributed by _____ from the storage location at the _____ _____.

Access to Information and Training Materials

All information required by regulation to be made available to the employees will be posted by *(insert name / title)* _____ _____ at the _____.

Local Occupational Health and Safety Regulations will also be kept on site.

Recordkeeping

Records required by AECOM's Hearing Conservation Program and Regulations shall be completed by _____ and shall be maintained at the _____ and placed on permanent file at the _____ for the minimum duration required by the standard. Employees can access their individual records by contacting _____.

All records required by this section will be transferred to any employee's successive employer if AECOM ceases to do business.

Approvals

Manager (print):

Signature: _____ Date: _____

SH&E Manager (print): _____

Signature: _____ Date: _____

Americas

Sound Level Survey

S3AM-118-FM2

Location: _____ **Date:** _____

Conducted By: _____

Sound Level Meter: _____ **Serial #:** _____

Calibrator Model: _____ **Serial #:** _____ **Class:** ☐ **1** ☐ **2**

Battery Check Completed: ☐ **Date of Factory Calibration:** _____

Test No.	Description Location/Equipment	Distance	dBA	Hearing Protection Required?		Comments
				Yes	No	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	
				☐	☐	

Drawing of Equipment or Work Layout

Reference Numbers refer to the Test Numbers on Page 1

Attachment B

Safety Data Sheet (Sweeping Compound)

62 Kearney Street
Paterson, New Jersey 07522
Phone 862-257-9394
Fax 862-257-9394

1582 Likens Road
Marion, Ohio 43302
Phone 740-223-0150
Fax 740-223-0152

127 Nance Road
Calhoun, Georgia 30701
Phone 706-629-3030
Fax 706-629-3080

SAFETY DATA SHEET

Date Prepared: 12/17/2014

1. Product And Company Identification

SDS ID: SDS1200001
PRODUCT IDENTITY: CLEAN SWEEP OIL BASE SWEEPING COMPOUND WITH GRIT

MANUFACTURER:

62 Kearney Street
Paterson, New Jersey 07522
Phone 862-257-9394
Fax 862-257-9394

1582 Likens Road
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Phone 740-223-0150
Fax 740-223-0152

127 Nance Road
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Phone 706-629-3030
Fax 706-629-3080

EMERGENCY PHONE NUMBER:
Chemtrec (800) 424-9300 (US and Canada)
(703) 527-3887 (International – Call Collect)
PRODUCT USE: Floor Sweeping Compound
RESTRICTIONS ON USE: None identified

2. Hazards Identification

GHS/OSHA Hazcom 2012 Classification:

Health	Environmental	Physical
Carcinogen Category 1A Specific Target Organ Toxicity – Repeat Exposure Category 1	Not Hazardous	Not Hazardous

Label Elements

DANGER!

Causes damage to lungs through prolonged or repeated inhalation exposure.
May cause cancer if inhaled.

Prevention: Do not breathe dust. Wash thoroughly after handling. Do not handle until all safety precautions have been read and understood. Wear protective gloves and clothing. Do not eat, drink or smoke when using this product	**Response:** Get medical advice if you feel unwell. **Storage:** **Disposal**: Dispose of contents and container in accordance applicable regulations.

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Fax 706-629-3080

3. Composition/Information On Ingredients

Component	CAS No.	Amount
Wood Dust	Mixture	Proprietary

The specific identity and/or exact concentration of components have been withheld as a trade secret.

4. First Aid Measures

INHALATION: Remove to fresh air. If irritation or other symptoms occurs, get medical attention.

SKIN CONTACT: Wash thoroughly with soap and water.

EYE CONTACT: Immediately flush eyes with cool running water, lifting upper and lower lids. If irritation persists or for foreign body in the eye, get medical attention.

INGESTION: If large amounts are swallowed, get medical attention. If conscious, give one glass of water. Never give anything by mouth to an unconscious person.

MOST IMPORTANT SYMPTOMS/EFFECTS, ACUTE AND DELAYED: Eye contact may cause mechanical irritation and possible eye injury. May cause cancer if respirable dust is inhaled over prolonged periods. May cause skin and respiratory irritation.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT, IF NECESSARY: No immediate medical attention is required.

5. Firefighting Measures

SUITABLE EXTINGUISHING MEDIA: Use water, foam, or carbon dioxide to extinguish fire. Cool fire exposed container with water.

SPECIFIC HAZARDS ARISING FROM THE CHEMICAL: This product is not flammable but the wood dust will burn under fire conditions. Thermal decomposition may produce carbon monoxide, carbon dioxide and smoke.

SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIRE FIGHTERS: Firefighters should always wear self-contained breathing apparatus and full protective clothing for fires involving chemicals or in confined spaces.

6: Accidental Release Measures

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT, AND EMERGENCY PROCEDURES: No special equipment is generally required for spill clean-up. For dusty conditions, an approved respiratory may be needed. Refer to Section 8 for additional information.

ENVIRONMENTAL HAZARDS: Report spill as required by local and federal regulations.

METHODS AND MATERIALS FOR CONTAINMENT/CLEANUP: Eliminate ignition sources. Sweep up and collect for re-use or disposal.

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7. Handling and Storage

PRECAUTIONS FOR SAFE HANDLING: Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Wash thoroughly with soap and water after use. If clothing becomes dusty, launder before re-use.

CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES: Store in a dry area. Keep away from ignition sources. Store away from oxidizers.

8. Exposure Controls / Personal Protection

EXPOSURE GUIDELINES

CHEMICAL	EXPOSURE LIMIT
Wood Dust	PEL - 5 mg/m³ TWA (respirable dust) PEL - 15 mg/m³ TWA (total dust) TLV - 1 mg/m³ TWA (inhalable dust)

APPROPRIATE ENGINEERING CONTROLS: General ventilation is adequate for normal use. If handling produces airborne dust, local exhaust ventilation may be needed.

PERSONAL PROTECTIVE EQUIPMENT:

EYE PROTECTION: Safety glasses or goggles recommended.

SKIN PROTECTION: None required with normal use.

RESPIRATORY PROTECTION: None required for normal use. For operations where the dust concentration may be excessive, a dust respirator may be used. Follow OSHA regulations in the selection and use of respiratory protection.

OTHER PROTECTIVE EQUIPMENT/CLOTHING: Eye flushing equipment should be available in the work area.

9. Physical and Chemical Properties

APPEARANCE:	Granular Solid	ODOR:	Slight paraffinic odor
ODOR THRESHOLD:	Not available	pH:	Not applicable
MELTING/FREEZING POINT:	Not applicable	BOILING POINT/RANGE:	Not applicable
FLASH POINT:	None	EVAPORATION RATE:	Not applicable
FLAMMABILITY (SOLID, GAS)	Not flammable, but will burn under fire conditions	FLAMMABILITY LIMITS:	Not applicable
VAPOR PRESSURE:	Not applicable	VAPOR DENSITY:	Not applicable
RELATIVE DENSITY:	Not available	SOLUBILITIES	Water Insoluble
PARTITION COEFFICIENT (n-octanol/water)	Not available	AUTOIGNITION TEMPERATURE:	Not applicable
DECOMPOSITION TEMPERATURE:	Not available	VISCOSITY:	Not applicable

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10. Stability and Reactivity

REACTIVITY: Not normally reactive

CHEMICAL STABILITY: Stable.

POSSIBILITY OF HAZARDOUS REACTIONS: Reaction with oxidizers will generate heat and may cause fire.

CONDITIONS TO AVOID: Avoid extreme heat.

INCOMPATIBLE MATERIALS: Strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may produce carbon monoxide, carbon dioxide and smoke.

11. Toxicological Information

POTENTIAL HEALTH EFFECTS:

ACUTE HAZARDS:
INHALATION: Inhalation of dust may cause irritation to the eyes, nose, throat and respiratory tract.

SKIN CONTACT: No known hazard.

EYE CONTACT: Contact may cause mechanical, abrasive irritation with possible injury.

INGESTION: No known hazard.

CHRONIC EFFECTS: Inhalation of excessive concentrations of any dust, including this material, may lead to lung injury. Wood dust has been classified by the International Agency for Research on Cancer (IARC) as "carcinogenic to humans" (Group 1) and "known to be a human carcinogen" by the National Toxicology Program (NTP). This classification is based primarily on increased risk in the occurrence of adenocarcinomas of the nasal cavities and paranasal sinuses associated with exposure to wood dust. The physical form of this product is such that no exposure to wood dust is likely under normal conditions of use, therefore the risk of adverse health effects is minimal.

CARCINOGENICITY LISTING: Wood dust has been classified by the International Agency for Research on Cancer (IARC) as "carcinogenic to humans" (Group 1) and "known to be a human carcinogen" by the National Toxicology Program (NTP). This classification is based primarily on increased risk in the occurrence of adenocarcinomas of the nasal cavities and paranasal sinuses associated with exposure to wood dust. The physical form of this product is such that no exposure to wood dust is likely under normal conditions of use, therefore the risk of adverse health effects is minimal.

ACUTE TOXICITY VALUES:
Wood Dust: Not Available

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12. Ecological Information

ECOTOXICITY: No data available for the product.

PERSISTENCE AND DEGRADABILITY: Wood dust will degrade in the environment.

BIOACCUMULATIVE POTENTIAL: Not bioaccumulative.

MOBILITY IN SOIL: No data available.

OTHER ADVERSE EFFECTS: No data available.

13. Disposal Considerations

Dispose in accordance with local, state and federal environmental regulations. Unused material is suitable for disposal in sanitary landfill. Used material may be subject to regulation, depending on the nature of the material absorbed. Check with appropriate regulatory authority for used material containing hazardous waste.

14. Transport Information

U.S. DOT HAZARD CLASSIFICATION:

PROPER SHIPPING NAME: Not Regulated
UN NUMBER: Not Applicable
PACKING GROUP: Not Applicable
LABELS REQUIRED: None

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15. Regulatory Information

EPA SARA 311/312 HAZARD CLASSIFICATION: Chronic Health

EPA SARA 313: None

CERCLA: This product is not subject to CERCLA release reporting. Many states have more stringent reporting requirements. Report releases as required by local and state regulations.

CALIFORNIA PROPOSITION 65: This product contains wood dust and D&C Red No. 19 which are known to the State of California to cause cancer.

TSCA: All of the components of this product are listed on the EPA TSCA Inventory or exempt from notification requirements.

EU REACH: Contact Oil Dri for information on REACH status.

JAPAN MITI: No data available

AICS: No data available

CANADIAN DSL: No data available

CANADIAN WHMIS CLASSIFICATION: Class D-2 A

This SDS has been prepared according to the criteria of the Controlled Products Regulation (CPR) and the SDS contains all of the information required by the CPR.

16. Other Information

NFPA RATING	HEALTH: 1	FIRE: 1	REACTIVITY: 0
HMIS Rating	HEALTH: 1*	FIRE: 1	REACTIVITY: 0

SDS Date of Preparation/Revision:

December 17, 2014 – Conversion to Hazcom 2012 classification and labeling and format.

DISCLAIMER:

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE OR WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, IS MADE WITH RESPECT TO THE INFORMATION CONTAINED HEREIN. THIS MATERIAL SAFETY DATA SHEET WAS PREPARED TO COMPLY WITH THE OSHA HAZARD COMMUNICATION STANDARD 29 CFR 1910, 1200 AND SUPESEDES ANY PREVIOUS INFORMATION. PREVIOUSLY DATED SHEETS ARE INVALID AND INAPPLICABLE.