ENVIRONMENTAL SERVICES, LLC

SOIL MANAGEMENT PLAN (SMP)

FOR

PROPOSED MONROE COUNTY SCHOOL DISTRICT
BUS TERMINAL SITE
5330 2ND AVENUE
STOCK ISLAND, MONROE COUNTY, FLORIDA 33040

Prepared For:

Monroe County School District
1310 United Street
Key West, Florida 33040

Prepared by:

EE&G Environmental Services, LLC
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Report Date: March 2019

Project No.: 2019 - 3083

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SECTION 1.0
INTRODUCTION

1.1 PURPOSE

EE&G Environmental Services, LLC (EE&G) was retained by the Monroe County School District (the Client) to complete a Soil Management Plan (SMP) that will provide the framework for addressing metal and petroleum-affected soils & groundwater during the future development of a proposed school bus terminal at the property addressed at 5330 2nd Avenue, Stock Island, Monroe County, Florida (hereafter referred to as "the *Property*").

1.2 AREA SETTING

The *Property* is located at the southwestern corner of the intersection of 5th Street and 2nd Avenue on Stock Island, an island located in the Lower Florida Keys. The *Property* currently included a two-storied building and two shed-like structures, which will be demolished as part of the redevelopment. A recent aerial photograph depicting the *Property* is provided as **Figure 1**.

1.3 HISTORY OF THE PROPERTY

The *Property* appeared to be shallow mangrove areas & bay bottom and/or forested areas in 1950. By 1959, the *Property* was in-filled. Between 1963 and 1975, the *Property* appeared to be vacant and undeveloped land with some evidence of minor onsite dumping. In 1982, the northern half of the *Property* appeared to have been partially in-filled and construction appeared to have begun. By 1985, the present-day structures had been developed and the *Property* was utilized by a construction company. The 1985 aerial photograph also showed evidence of in-filling across a portion of the southern-half of the Property. Between 1991 and 2000, the usage as a construction company appeared to continue with additional in-filling and the storage of their equipment and vehicles across the site. By 2004, the southern portion of the *Property* had become heavily vegetated. By 2016, the majority of the equipment and vehicles had been removed from the *Property* while stockpiles of soils remained onsite.

1.4 CONCEPTUAL REDEVELOPMENT PLAN

The *Property* is being redeveloped with a school bus & transportation facility. The design plan includes an L-shaped building at the western portion of the parcel which will include the administrative offices and vehicle maintenance & support bays. The proposed facility also will include washing and fueling stations at the northern portion of the parcel. The fueling station will include an underground storage tank (UST) and dispenser island. The overall facility will largely be covered with hardscaping (i.e. the building or asphalt & concrete surfaces) and will include perimeter fencing and landscaping at the boundaries. Site drainage will include a large Stormtech Chamber System in the central portion of the property, underground stormwater piping throughout the site (both solid and perforated), and detention swales in the landscaped boundary areas. The stormwater effluent from the drainage systems will discharge to a double-chambered injection well which will extend to a minimum depth of 120-feet below land surface (BLS). Municipal sanitary sewer and potable water is available to the *Property*. A map illustrating the conceptual design of the proposed transportation facility layout is provided as **Figure 2**. A site layout map of the proposed facility is provided as **Figure 3**.

The site redevelopment plan will incorporate an Engineering Control barrier to minimize direct-exposure concerns. Engineering Controls will have a combination of impervious cover features including buildings, sidewalks, and concrete & asphalt parking lot and driveway areas. The

majority of the *Property* will be covered with impervious surfaces; however, a small amount of landscaped areas will be present, which upon project completion will need to be covered with at least 2-feet of clean fill to provide an appropriate Engineering Control. The development will require the site elevation to be raised approximately one to two feet in several areas. This will be achieved using soils generated during deeper excavation of the utility trenches, pile and cap installations, etc. The plan is to use existing stockpiled soils supplemented with imported fill material, as needed, to raise the grade. Imported fill shall be sourced from a reliable quarry to provide clean material, or if from another source the material should be tested to assess for the presence of arsenic, lead, PAHs, and TPHs.

The construction activities are anticipated to penetrate the watertable interface during the installation of stormwater underground drainage piping, the Stormtech Chamber System, the double-chambered injection well, and fuel UST. Dewatering also is anticipated in at least the area of the fuel UST system.

1.5 HYDROGEOLOGY

The regional geologic framework underlying the *Property* is comprised of Pleistocene-aged limestones, designated the Miami Oolite formation. This formation extends from surface grade to approximately 50-feet below land surface (BLS) and is underlain by the Key Largo Limestone, which is a coralline limestone (reef). The Tamiami formation is encountered at approximately 150-feet and contains a green-gray clay-like, sandy layer that forms the base of the surficial aquifer. According to the Soil Survey of Monroe County, Florida published by the United States Department of Agriculture (USDA) Soil Conservation Service, the soil in the area has been classified as Udorthents - Urban Land.

Potable water is distributed from the mainland by the Florida Keys Aqueduct Authority. The average depth-to-groundwater ranges from 2 to 5-feet BLS and is tidally-influenced.

SECTION 2.0
SUMMARY OF PAST & CURRENT ASSESSMENT FINDINGS

EE&G conducted assessments of the *Property* including a Phase I Environmental Site Assessment (ESA) in April 2017, a Phase II ESA in May 2017, as well as an Expanded Phase II ESA in June 2017. The results of the soil and groundwater testing documented the following conditions:

- Total arsenic was detected in five surficial soil samples above the Florida Department of Environmental Protection's (FDEPs) *residential-use direct exposure* Soil Cleanup target Level (SCTL), but below the *commercial-use direct exposure* SCTL. One soil sample also contained polynuclear aromatic hydrocarbon (PAH) benzo(a)pyrene equivalents slightly in excess of the *residential-use direct exposure* SCTL.

- Over the course of the Phase II and Expanded Phase II ESA, five soil samples were collected in the immediate vicinity of the former fuel AST secondary containment at the central portion of the *Property*. The results of these five samples did not identify the analyzed parameters above their FDEP SCTLs. Soil samples collected at/below the watertable interface (approximately 3-feet BLS) exhibited elevated net organic vapor readings and a hydrocarbon odor. However, the corresponding confirmation soil samples did not confirm the presence of analyzed parameters above the SCTLs.

- EE&G collected two composite samples to assess the general quality of the soils stockpiled at the eastern and central portions of the *Property*. These samples were laboratory analyzed for total arsenic, barium, chromium, lead, PAHs and total petroleum hydrocarbons (TPHs), which did not exceed their applicable SCTLs. However, the composite samples did contain total arsenic slightly above the *residential-use direct exposure* SCTL.

- EE&G collected groundwater samples via direct-push drilling during the initial Phase II ESA and via monitoring wells during the Expanded Phase II ESA. No evidence of strong hydrocarbon odors, petroleum sheen or product was observed on the groundwater purged during sampling. Phase II ESA groundwater samples from locations GW-1 (adjacent to the former gasoline AST area) and GW-3 (near the southern boundary) contained results which exceeded either their applicable Groundwater Cleanup Target Levels (GCTLs) and/or Natural Attenuation Default Source Concentrations (NADSCs) for MTBE (a common gasoline additive), TPHs and total arsenic & lead. However, following additional analysis of the groundwater samples and confirmation groundwater sampling via the installation of monitoring wells, TPHs, arsenic and lead were determined not to be present at levels above their GCTLs or NADSCs, and the contaminant of concern (CoC) in the groundwater appeared to only be MTBE (a VOA compound).

  The MTBE concentration at the assumed source area (monitoring well MW-1 located adjacent to the drain valve of the former AST containment) exceeded both the GCTL and NADSC; however, no presence of free-floating product or sheen was observed in the groundwater samples. The results suggest a southwestern migration of the impacted groundwater. The MTBE-affected area was not completely delineated horizontally with the five monitoring wells installed as part of the Expanded Phase II ESA, as the results from MW-4 contained MTBE slightly above the GCTL. However, the inferred extent of petroleum-affected groundwater was interpreted within the boundaries of the *Property*. The inferred extent of the MTBE-affected groundwater area is illustrated in **Figure 4**. The Phase II ESA soil results are summarized in **Figure 5**.

SECTION 3.0
SOIL MANAGEMENT PLAN

3.1 HEALTH & SAFETY

The General Contractors and tier-down subcontractors will be required to maintain and comply with applicable Occupational Safety & Health Administration (OSHA) regulations and guidelines during redevelop activities, as outlined within their own company's own health & safety plans.

EE&G also will prepare under separate cover a Health & Safety Plan (HASP) specific to the planned redevelopment, which will be intended as a supplemental guideline with recommendations and procedures to be employed to maintain a safe working environment within an impacted work zone. Recommendations will include, but are not limited to, the following:

- The recommended emergency hospital and trauma center will be identified for workers.
- The site will be fenced-restricted from unauthorized public access during construction.
- Health & safety communication and contractor notifications of the site conditions will be conducted.
- A wash station will be placed onsite to facilitate employees washing their hands on a regular basis and prior to eating or leaving the site.
- Eating and smoking restrictions will apply in affected areas to minimize potential ingestion and inhalation hazards.
- Contractors working in wet trenches will be made aware of the potential presence of petroleum- and/or arsenic-affected soils and groundwater, and they will be required to adjust personal protection equipment (PPE) as site conditions dictate.

3.2 DUST CONTROL

Dust control measures are commonly implemented at construction sites to minimize the potential for the creation of fugitive emissions from onsite soil handling and operation activities. The General Contractor will implement a Dust Control Plan during site preparation in order to minimize dust generation during the excavation and soil relocation activities. The plan will primarily consist of routine watering of soils at the site to minimize dust. The wetting will be accomplished with a water truck or hoses connected to temporary water service spigots. Dust control activities will also be weather-dependent (less required on rainy days and more on hot & windy days). The water utilized for dust control will be obtained from a reputable non-affected water source, i.e. the Florida Keys Aqueduct Authority. Water from the nearby surface water basins, the Atlantic Ocean and/or Gulf of Mexico, also may be utilized, if allowed by their construction permit or local authority approval.

In addition to the overall site dust control activities, supplemental wetting and/or misting may be required during the pile cap installations, grade cutting and in-filling, trenching areas with significantly affected soils and/or when stockpiling affected soils. These activities may require additional personnel to directly mist the areas involved in these processes, above and beyond the general dust control plan.

The General Contractor will construct and maintain a vehicle wash station at the main egress points, so that vehicles with excessive soils adhered to the vehicle or tires, can be spray washed before exiting the site. The responsibility to man the vehicle wash station will be the General Contractor's, and depending on conditions may require dedicated personnel. The General Contractor also on a daily basis shall sweep the areas in front of the egress points to bring back any fugitive soils onto the development site.

It is also recommended that a wind screen barrier be installed to the construction boundary chain-link fencing. This barrier will further help minimize offsite dust migration and will provide a deterrent to lingering offsite pedestrian traffic.

3.3 EROSION CONTROL

Controlling sediment run-off is a common component of construction sites to minimize potential movement of sediments or storm water onto adjoining properties or into storm water drainage systems. In order to control sediment run-off, the General Contractor will install an erosion control silt fence barrier, which will consist of fiberglass sheet material (or similar reinforced material) and wooden stakes will be installed along the entire boundary of the site (except for egress areas during daily work hours). In areas where large changes in site elevation/grade are present, hay bales may be placed along the lines of equal elevation to disrupt downhill sheet flow, etc. The erosion control system integrity will be inspected by the General Contractor on a regular basis, and if segments of the silt fence become damaged then they must be immediately repaired. In the case that affected sediment impounding occurs along the base of the silt fence, these materials will be relocated within the guidance of Section 3.5 of this SMP.

Special erosion control precautions also should be taken if site activities occur during the hurricane season in South Florida. In the case that a tropical storm, depression or hurricane warning is issued, the following activities will need to be implemented:

- Stockpiles of affected soils will not exceed a height of five feet above grade.
- Visqueen covering shall be placed over the stockpiled affected materials and it will be secured appropriately.
- Open excavations where impacted groundwater is located will be closed until the storm conditions abate.

3.4 DEWATERING EFFLUENT MONITORING

This dewatering effluent monitoring plan was designed to address the MTBE contamination issue identified in the Phase II ESA. EE&G is currently unaware of monitoring requirements that may be imposed by other permits. Therefore, the General Contractor should review such requirements independent of this plan.

Dewatering is anticipated during the development activities, which include the proposed fuel UST area, and possibly for the stormwater piping and/or sanitary sewer & water conveyances. The effluent will be discharged into the stormwater gravity injection well system or to an onsite temporary drainage area. The dewatering effluent will be sampled on a daily basis for the first 3 days, then weekly thereafter. Samples will be shipped overnight to the environmental laboratory, and analyzed on a 24-hour expedited basis (taking into account overnight shipping from the Keys to the laboratory in Ormond Beach, FL). Samples will be analyzed for Volatile Organic Aromatics (VOAs) by EPA Method 8260.

The results will be compared to the FDEP's GCTLs or the County sanitary sewer discharge criteria (if sewer disposal is utilized). If results exceed the standards, EE&G will discuss options with the General Contractor to reduce the concentrations to acceptable levels.

A contingency shall be put into place by the General Contractor for pre-treatment of the effluent prior to discharge. If FFP is encountered within an excavation or effluent, the material should be captured or removed for proper offsite disposal under manifest thru a licensed waste hauler.

3.5 SOIL RELOCATION PLAN (SRP)

The existing grade across a majority of the *Property* will need to be raised approximately 1 to 2-feet and will be largely hardscaped with a building and parking lot & driveway areas. A diagram illustrating the proposed impervious areas versus the green spaces is provided as **Figure 3**.

Soils excavated during construction activities from vadose zone areas (the dry soils located above the watertable interface) such as pipe trenching, pile caps, landscaped areas, etc. will be relocated to raise the general site grade, and to form the base of the building pad and the parking lot. Stockpiled soils already located onsite also will be used for this purpose and also will be placed under hardscape. These onsite soils will be supplemented as needed with clean imported fill from a reliable quarry source (or tested if from an alternative source). If excavated soils require export, then the soils should be tested (arsenic, lead, VOAs, PAHs, and TPHs) to determine disposal requirements.

Soils excavated from below the watertable interface have the potential to be petroleum-affected. In the event that soils are encountered that exhibit petroleum odors or staining/sheen, then those soils should be stockpiled separately on plastic and covered. These soils should be tested (arsenic, lead, VOAs, PAHs, and TPHs) to determine if they are suitable for re-use onsite or warrant offsite disposal.

Excavated soils should only be re-used above the watertable. No excavated soils will be re-used below the water table without prior characterization to evaluate the potential for leaching. Only clean imported fill should be considered for re-use below the water table. Imported soils should be sourced from a reputable quarry, or if from a non-quarry local source, the material will be tested for the presence of potential constituents of concern prior to being transported to the *Property* to demonstrate the soil meets FDEP clean soil guidance criteria.

Any excess excavated soils awaiting re-use options will be placed in a pre-designated location to control dust and runoff concerns. When excavated affected soil is temporarily stored or stockpiled onsite, the soil shall be placed on an impermeable surface or on visqueen, and then securely covered with visqueen. The temporary storage or stockpiling of excavated affected soil shall not exceed 30 days. Special precautions also should be taken if site activities occur during the hurricane season (June 1 through November 30) or when a tropical storm, depression or hurricane warning is issued. In addition to the above requirements, the General Contractor will undertake and expedite efforts to remove and dispose offsite the stockpiles containing affected soils.

It is the intention of this development project to re-use all excavated soils onsite beneath the Engineering Control barrier. However, any excavated soils that can not be reused onsite must be analytically characterized prior to transportation offsite in order to evaluate disposal options. Offsite re-use characterization will include at a minimum total arsenic, lead, VOAs, PAHs and TPHs. Additional analyses may be warranted depending upon the source area of the soils, field observations, and the requirements of the receiving disposal facility.

3.6 CONCEPTUAL ENGINEERING CONTROL

Upon completion of the development, the *Property* will be covered with a surficial Engineering Control barrier. The objective of the Engineering Control will be to minimize direct exposure to underlying affected soils. A diagram illustrating the proposed impervious areas versus the green spaces is provided as **Figure 3**. The Engineering Control will consist of the following:

- An impervious barrier, which will consist of the buildings, parking lots, sidewalks, and boardwalk.

- Any pervious landscaped areas will be covered with a minimum of 2-feet of clean soils. The redevelopment plan has limited landscaped areas planned around the boundary and parking lot. Following final grading, confirmation analytical soil testing will be conducted to verify pervious landscaped areas comply with the Engineering Control requirement. Therefore, it is critical that no soil mixing or co-mingling of affected soils with clean fill occurs in the landscaped engineering control areas. The verification testing will include a minimum of 10 soil samples collected from the 0 to 2-feet BLS intervals of landscaped areas. The soils will be analyzed for total arsenic, lead, VOAs, PAHs and TPHs.

- A map will be prepared that illustrates the areas where soils were excavated and where onsite relocation has occurred beneath the engineering control cap.

Upon completion of the development, an Engineering Control Verification Report shall be prepared and submitted to the FDEP, which will include a summary of the site development implementation details, documentation of the soil relocation details, a summary of the soil characterization results and landscape soil verification results, and an Engineering Control Layout Map that illustrates the final surface cover. The Engineering Control Verification Report will be submitted to the FDEP to support the recommendation for a Conditional Site Rehabilitation Completion Order (CSRCO) for the *Property*.

3.7 OTHER CONSIDERATIONS

As with any construction site in a commercial and industrial area, there is the potential to encounter previously unknown or undocumented environmentally-sensitive issues, such as septic tanks, improperly abandoned USTs, piping, buried debris, free-floating product (FFP) and/or stained soils. In the event such issues are encountered that have not already been addressed under this SMP, then they will be addressed individually with the degree of attention warranted by the situation. The General Contractor will immediately notify EE&G, in the event such a situation is encountered, who will inspect and document the response action. Such issues will be addressed in accordance with State and County regulations. Any wastes generated and/or removed during the mitigation of an issue will be properly characterized and disposed under manifest by a licensed waste hauler. USTs will be permitted and removed by a Florida-licensed Pollutant Specialty System Storage Contractor (PSSSC) in accordance with Chapter 62-761, FAC. The FDEP should be notified of discoveries in accordance with Chapter 62-780, FAC, and the appropriate backup closure documentation provided.

SECTION 4.0
ENVIRONMENTAL PROFESSIONAL STATEMENT

This Soil Management Plan was prepared by the following EE&G professionals:

Report Prepared By:

Adam B. Brosius, EP
Senior Staff Professional

Report Reviewed By:

Craig C. Clevenger, PG
Senior Hydrogeologist
EE&G

Professional Geologist Statement

I, Craig C. Clevenger, P.G. #1666, certify that I currently hold an active license in the state of Florida and am competent through education and experience to provide the geological consulting services documented in this Soil Management Plan. I further certify that this report was prepared under my direction. Moreover, I certify that EE&G holds an active certificate of authorization #GB483 to provide geological services in the state of Florida.

Craig C. Clevenger, P.G. #1666

March 27, 2019
Date

FIGURES

EE&G Environmental Services, LLC
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Phone (305)374-8300 Fax (305)374-9004

MCSD Bus Termianl
5330 2nd Avenue
Stock Island, FL 33040
Project #: 2017-3083.JPH2

2018 AERIAL PHOTOGRAPH

FIGURE 1

EE&G

ENVIRONMENTAL SERVICES, LLC
5751 MIAMI LAKES DRIVE
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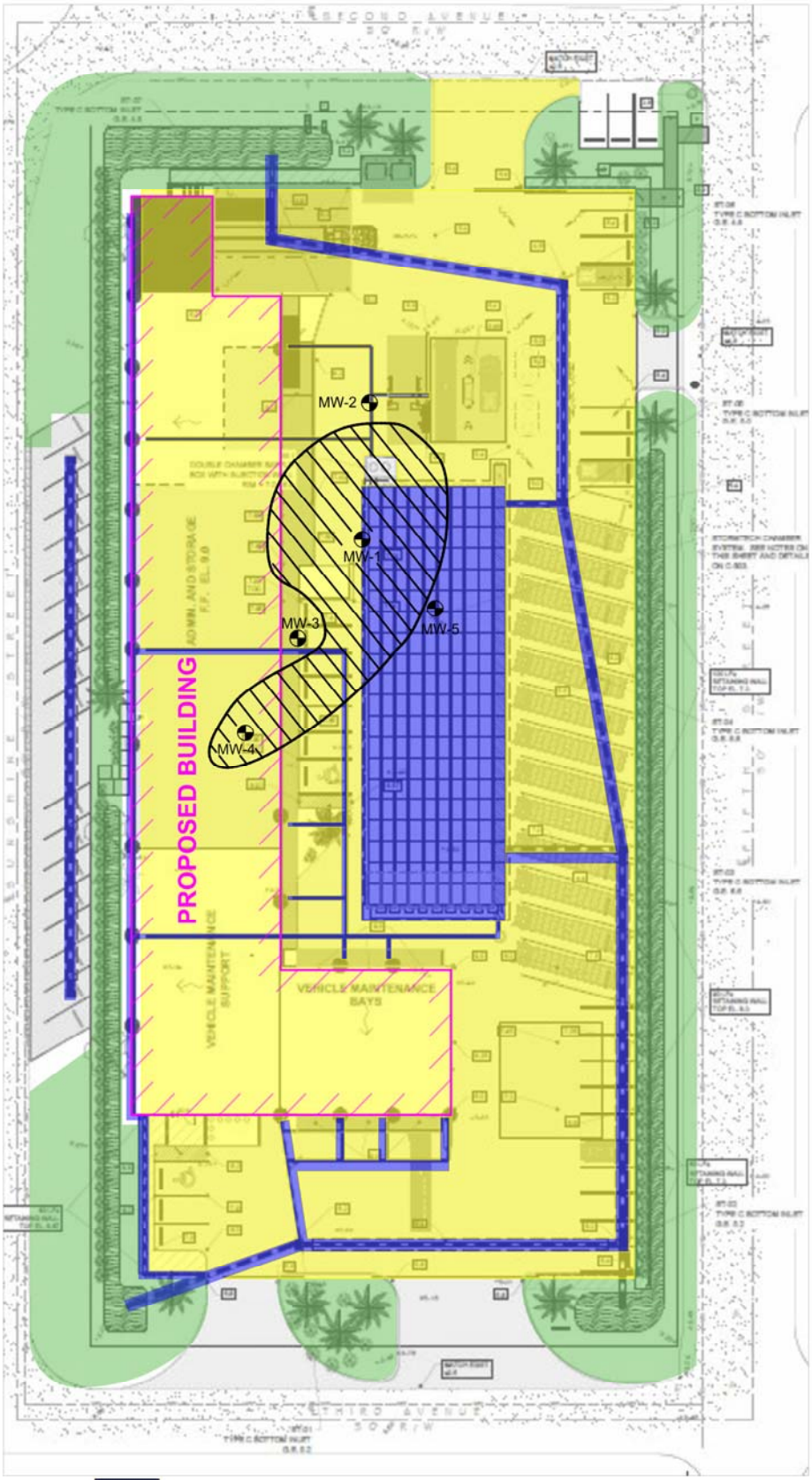
MCSD BUS TERMINAL
5330 2nd AVENUE
STOCK ISLAND, FLORIDA 33040

CONCEPTUAL
DESIGN LAYOUT
MAP

Date:03/21/2019
Project # 2017-3083
Drawn by: JL
Cad File: FIG 2
Dwg. Scale: As Noted

FIGURE
2



= SITE DRAINAGE SYSTEM

= LANDSCAPING AREAS - TO INCLUDE 2-FEET OF CLEAN FILL COVER

= BUILDING & HARDSCAPE

= PETROLEUM AFFECTED GROUNDWATER AREA

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MCSD BUS TERMINAL
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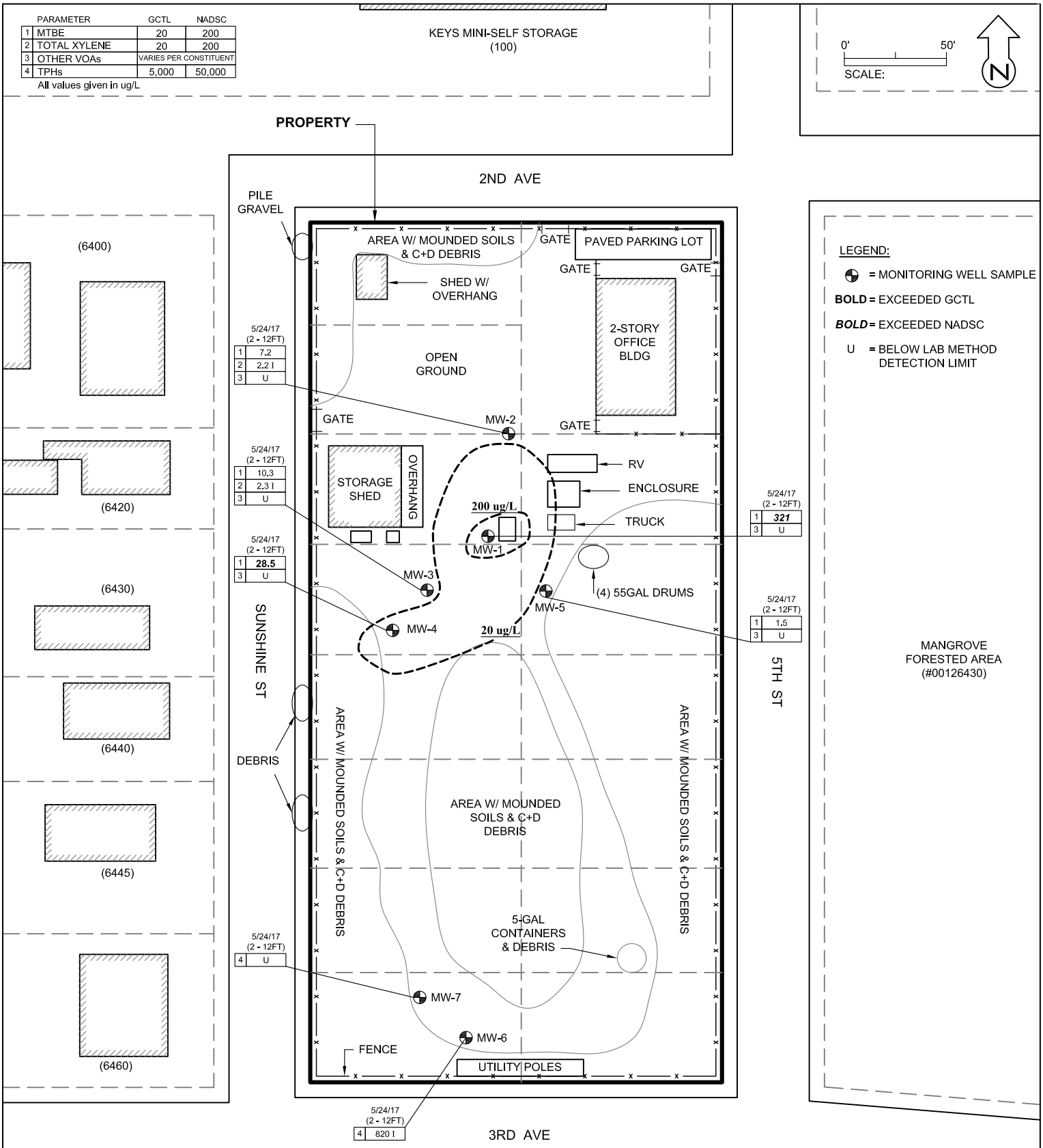
PROPOSED REDEVELOPMENT PLAN

Date: 03/21/2019
Project # 2017-3083
Drawn by: JML
Cad File:FIG 3
Dwg. Scale: As Noted

FIGURE 3

	PARAMETER	GCTL	NADSC
1	MTBE	20	200
2	TOTAL XYLENE	20	200
3	OTHER VOAs	VARIES PER CONSTITUENT	
4	TPHs	5,000	50,000

All values given in ug/L



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MCSD BUS TERMINAL
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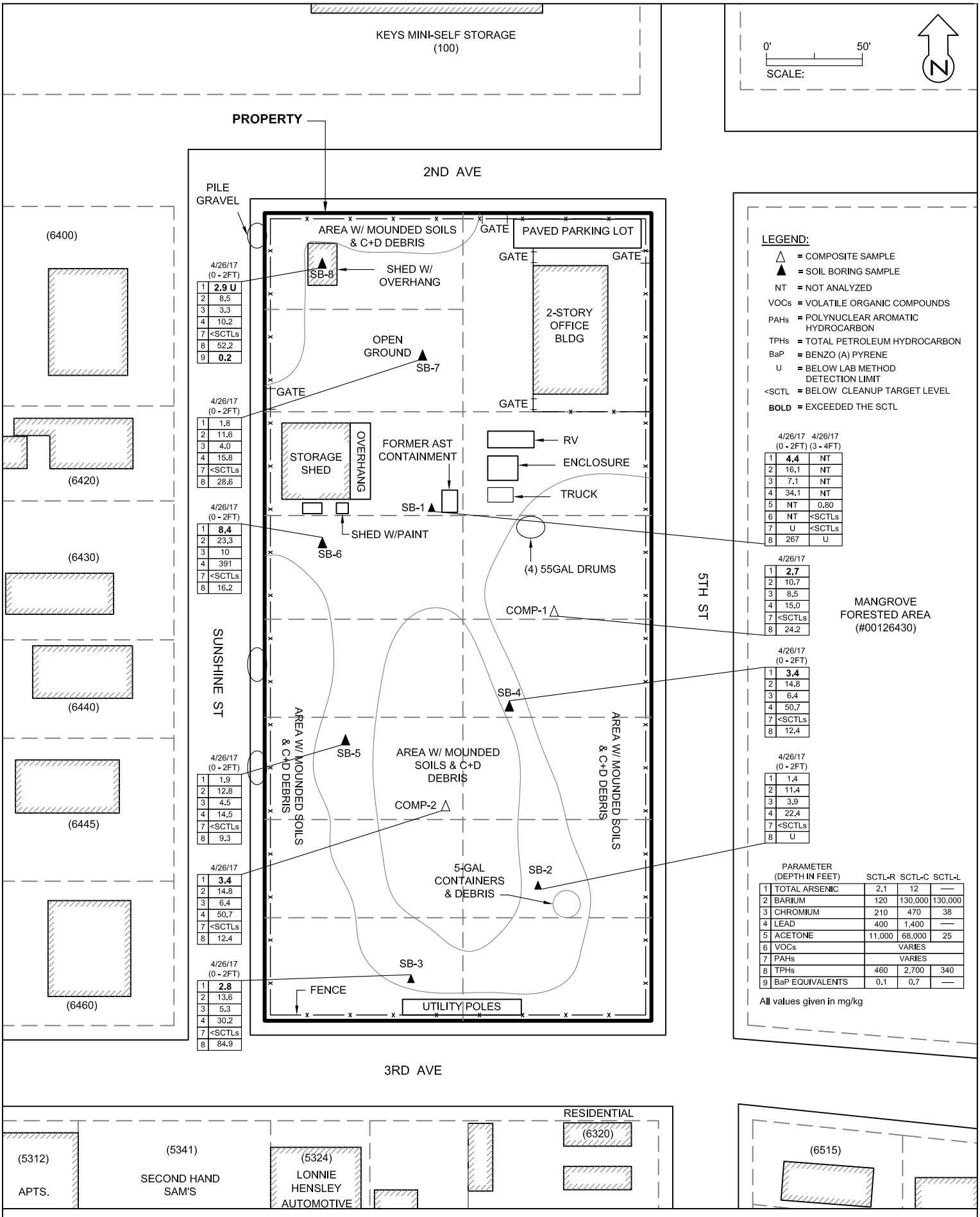
STOCK ISLAND, FLORIDA 33040

PHASE II ESA
GROUNDWATER
RESULTS MAP

Date:	03/21/19
Project #	2017-3083
Drawn by:	NV
Cad File:	FIG4
Dwg. Scale:	As Noted

FIGURE 4



4/26/17 (0 - 2FT)

1	**2.9 U**
2	8.5
3	3.3
4	10.2
7	<SCTLs
8	52.2
9	**0.2**

4/26/17 (0 - 2FT)

1	1.8
2	11.6
3	4.0
4	15.8
7	<SCTLs
8	28.6

4/26/17 (0 - 2FT)

1	**8.4**
2	23.3
3	10
4	391
7	<SCTLs
8	16.2

4/26/17 (0 - 2FT)

1	1.9
2	12.8
3	4.5
4	14.5
7	<SCTLs
8	9.3

4/26/17

1	**3.4**
2	14.8
3	6.4
4	50.7
7	<SCTLs
8	12.4

4/26/17 (0 - 2FT)

1	**2.8**
2	13.6
3	5.3
4	30.2
7	<SCTLs
8	84.9

LEGEND:

△ = COMPOSITE SAMPLE
▲ = SOIL BORING SAMPLE
NT = NOT ANALYZED
VOCs = VOLATILE ORGANIC COMPOUNDS
PAHs = POLYNUCLEAR AROMATIC HYDROCARBON
TPHs = TOTAL PETROLEUM HYDROCARBON
BaP = BENZO (A) PYRENE
U = BELOW LAB METHOD DETECTION LIMIT
<SCTL = BELOW CLEANUP TARGET LEVEL
BOLD = EXCEEDED THE SCTL

4/26/17 (0 - 2FT) | 4/26/17 (3 - 4FT)

1	**4.4**	NT
2	16.1	NT
3	7.1	NT
4	34.1	NT
5	NT	0.80
6	NT	<SCTLs
7	U	<SCTLs
8	267	U

4/26/17

1	**2.7**
2	10.7
3	8.5
4	15.0
7	<SCTLs
8	24.2

4/26/17 (0 - 2FT)

1	**3.4**
2	14.8
3	6.4
4	50.7
7	<SCTLs
8	12.4

4/26/17 (0 - 2FT)

1	1.4
2	11.4
3	3.9
4	22.4
7	<SCTLs
8	U

	PARAMETER (DEPTH IN FEET)	SCTL-R	SCTL-C	SCTL-L
1	TOTAL ARSENIC	2.1	12	—
2	BARIUM	120	130,000	130,000
3	CHROMIUM	210	470	38
4	LEAD	400	1,400	—
5	ACETONE	11,000	68,000	25
6	VOCs	VARIES		
7	PAHs	VARIES		
8	TPHs	460	2,700	340
9	BaP EQUIVALENTS	0.1	0.7	—

All values given in mg/kg

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MCSD BUS TERMINAL
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PHASE II ESA
SOIL RESULTS
MAP

Date: 03/26/2019
Project # 2017-3083
Drawn by:JL
Cad File: FIG5
Dwg. Scale: As Noted

FIGURE 5