Honeywell

Health, Safety, Environment, & Product Safety
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September 20, 2019

Charlie Post
Project Manager
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway, Floor 11
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Subject: Tar Vault IRM Work Plan
610 Smith Street Site – NYSDEC BCP Site # C224215
Barrett Manufacturing Site – NYSDEC Site # 224197

Dear Mr. Post,

Per our discussions on August 27, 2019, please find attached a draft IRM Work Plan for remediation of the tar vault at 628 Smith Street in Brooklyn, NY. This draft IRM Work Plan is submitted pursuant to Order on Consent and Administrative Settlement, Index No. 2-20160111-14, executed by NYSDEC and Honeywell International Inc., and Brownfields Cleanup Agreement No. C224215, executed by NYSDEC and 610 Smith Street LLC.

If you have any questions in regards to the information provided herein, feel free to contact me at 302-791-6738.

Regards,

Steve Coladonato
Honeywell

cc: Andrew Gugielmi, Esq., NYSDEC Office of General Counsel (letter only)
Gerard Burke, Director, Remedial Bureau B
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Interim Remedial Measure (IRM) Work Plan
Tar Vault Remediation
628 Smith Street, Brooklyn, NY

Prepared For:

Honeywell

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September 2019

ENGINEER'S CERTIFICATION

CERTIFICATION OF COMPLETION

I, Craig F. Butler, certify that I am currently a New York State registered Professional Engineer (P.E.) and that this Interim Remedial Measure (IRM) Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the New York State Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation (DER-10).

09/18/19

Craig F. Butler, P.E.
New York, No. 080807

Date

PARSONS

TABLE OF CONTENTS

SECTION 1 INTRODUCTION 1-1

1.1 INTRODUCTION 1-1

1.2 BACKGROUND 1-1

1.3 TAR VAULT DESCRIPTION 1-2

1.4 IRM PLANNING 1-3

SECTION 2 REMEDIAL ACTION 2-1

2.1 IRM OBJECTIVES 2-1

2.2 DESCRIPTION OF IRM 2-1
- 2.2.1 Overview 2-1
- 2.2.2 Site Control and Other Protective Measures 2-2
- 2.2.3 Ventilation and Odor Control 2-3
- 2.2.4 Vault Dewatering 2-3
- 2.2.5 Tar Removal 2-4
- 2.2.6 Installation of Barrier System 2-4
- 2.2.7 Demobilization 2-4

SECTION 3 ALTERNATIVES CONSIDERED 3-1

3.1 TAR REMOVAL 3-1

3.2 BARRIER SYSTEM 3-2
- 3.2.1 Stone Layer 3-2
- 3.2.3 Lower Barrier Layer 3-2
- 3.2.2 Upper Barrier Layer 3-3

SECTION 4 HEALTH AND SAFETY PLANNING 4-4

4.1 HEALTH AND SAFETY PLAN (HASP) 4-4

4.2 COMMUNITY AIR MONITORING PROGRAM (CAMP) 4-4

SECTION 5 REPORTING 5-1

SECTION 6 PROPOSED PROJECT SCHEDULE 6-1

FIGURES

Figure 1 Location of Block 492, Lot 20, and Tar Vault at 628 Smith Street

Figure 2 First Floor Plan for 628 Smith Street Building

Figure 3 Tar Vault Cross Section (Typical)

Figure 4 Equipment Layout

Figure 5 Proposed IRM Barrier System

Figure 6 Tar Vault IRM Draft Schedule

APPENDICES

Appendix A Tar Vault Investigation Summary

Appendix B Vault Headspace Air Data

Appendix C Technical Specifications

Appendix D Community Air Monitoring Plan (CAMP)

SECTION 1
INTRODUCTION

1.1 INTRODUCTION

This work plan describes proposed activities for the remediation of a tar vault located beneath the building at 628 Smith Street, Brooklyn, NY (**Figure 1**). Planned activities include site preparation, removal of water and pumpable tar from the vault, incorporation of concrete or a similar pozzolanic product into the remaining tar to enhance stability, installation of a barrier system, and site restoration upon completion of the work.

Measures which have been identified to protect the health and safety of the public and on-site personnel during remedial activities include:

- Preparation of a Health and Safety Plan
- Preparation of a Fire Prevention Plan
- Provision for traffic control
- Establishment of exclusion zones
- Provision for odor control and community air monitoring

These procedures and relevant requirements are further described within this work plan. Following contractor selection and finalization of means and methods, and prior to start of work, a contractor Health and Safety Plan will be provided to the New York State Department of Environmental Conservation (NYSDEC).

1.2 BACKGROUND

This IRM addresses a site located on municipal Block 492, Lots 15 and 20 (NYSDEC Site: 224197) in Brooklyn, Kings County, New York. The Site is referred to herein as the "Former Barrett Manufacturing Site." On March 11, 2016, NYSDEC and Honeywell executed an Order on Consent and Administrative Settlement, Index No. 2-20160111-14 (the "Order") for the Former Barrett Manufacturing Site. Additionally, the owner of Lot 20 (610 Smith Street LLC) is subject to a Brownfields Cleanup Agreement (BCA No. C224215) with NYSDEC. The Order called for Honeywell to develop and execute a Site Characterization Work Plan for the Site, and also allowed Honeywell and the DEC to conduct IRMs for the Site based on the mutual agreement of the parties.

Between 1904 and 1939, the Barrett Manufacturing Company located a portion of their operations on Block 492, Lot 20 (**Figure 1**). Former operations of Barrett at this location consisted of the manufacture of roofing materials, including tar-treated roofing paper. Several potential tar-containing above-ground and subsurface structures associated with these operations were present, including a large-capacity tar vault located under the first floor of the building on Block 492, Lot 20. This tar vault is the subject of this IRM workplan. The location of the tar vault is depicted in **Figures 1 and 2**.

Lot 20 is currently owned by 610 Smith St. LLC and is improved with a three-story building containing a total of 24 units. The address of the building is 628 Smith Street a/k/a 610-628 Smith Street. Building uses include artist studios and workshops on the first and second floors and a silk screen printing business on the third floor. The southern portion of the building is slab on grade with no basement. The tar vault is located below the first floor in the central and northern portions of the building (**Figure 2**).

The tar vault was identified during the development of a Site Characterization Work Plan for the Former Barrett Facility. NYSDEC approved a Vault Investigation Work Plan in a letter to 610 Smith St. LLC date June 27, 2017. In 2018, the tar vault was investigated to gather information on the configuration of the vault and the extent and chemical characteristics of the materials remaining in it; this investigation supplemented two previous limited assessments of the vault in 2016 and 2017. The results of the investigation and assessments were reported in a technical memorandum dated August 6, 2018, prepared pursuant to the BCA with 610 Smith St. LLC (**Appendix A**).

On May 29, 2019, Honeywell offered to provide NYSDEC with a workplan to remediate the tar vault. This IRM Workplan is submitted pursuant to both the Order between Honeywell and NYSDEC and the 610 Smith Street Brownfields Cleanup Agreement.

1.3 TAR VAULT DESCRIPTION

The results of the 2016, 2017, and 2018 investigations of the tar vault at the 628 Smith Street building are described in the Parsons 2018 Technical Memorandum: Tar Vault Investigation Summary (**Appendix A**). This memo was submitted to the NYSDEC on August 30, 2018. The investigation was performed using six hatches which provided access to the vault from the first floor of the building. The memorandum describes the results obtained from the following scope of work:

- Video inspection at six hatch locations to determine the configuration and physical construction of the tar vault;
- Collection of water samples at two locations for laboratory analysis;
- Measurements (using a tile probe and water level meter) to determine vault configuration and water/tar depths and thicknesses;
- Collection of tar samples for physical properties analyses at six locations and chemical analyses at three locations; and
- A survey of the 628 Smith Street building corners and the hatches including locations and elevations.

The tar vault is approximately 150 feet long and 100 feet wide (less a cutout for the elevator shaft) and is located under the northern portion of the building. A floor plan illustrating the location of the vault and the six access hatches is attached as **Figure 2**; an approximate cross section of the vault is attached as **Figure 3**.

The video inspection of the space between the water surface and the vault ceiling documents a grid of steel beams supporting the first floor wood plank subfloor and plywood flooring. The

steel beams are typically supported by concrete columns which extend to the base of the vault floor but, in the vicinity of Hatch 4, wooden columns were observed. In the vicinity of Hatch 2, what appears to be a supplemental horizontal steel beam was also observed. The visible sides of the vault above the water appear to be constructed of concrete and brick.

Measurements of depth-to-water and depth-to-tar, tar thickness, and observations of trash and debris were noted during the inspection at each hatch. In general, approximately 10 ft of water was observed to overlie approximately 1.2 to 1.5 ft of tar within the vault. Physical stratification of the tar (i.e., significant difference in density) was not detected during probing. During tar sampling, the material was observed to be of a similar black color at all locations. The observed consistency of the tar recovered by the samplers was generally uneven, with some congealed blobs among the more fluid tar. A significant amount of debris was observed floating on the surface of the water at several of the hatches. Additionally, a large amount of debris was observed to be present in and around the water and tar interface.

The existing tar vault is believed to have integrity based on multiple lines of evidence, including:

- Surface water in the tar vault is at a higher elevation than surrounding groundwater (average of 5.98 feet versus 4.80 feet, respectively, based on 3 measurement events) indicating the vault is hydraulically isolated from the surrounding groundwater.
- The physical properties of the tar (e.g., high viscosity; range from 15,000 to 80,000 centistokes at the approximate temperature just below the water table) would make it difficult for tar to migrate from the vault.
- Tar was not observed in monitoring wells in close proximity to the vault during the Site Characterization investigation.
- The vault was designed to contain tar to support efficient historical operations.

As part of an indoor air assessment performed pursuant to the Site Characterization Work Plan, air in the vault headspace was sampled and analyzed for a variety of volatile organic compounds. Analytical results are presented in **Appendix B**. Naphthalene, benzene, toluene, and ethyl benzene, and xylenes, which are constituents of tar, were detected in the vault headspace; naphthalene, ethylbenzene, and xylenes were detected at concentrations above typical background concentrations. The presence of these constituents in the vault headspace represents a potential exposure pathway if these constituents were to further migrate to indoor air.

1.4 IRM PLANNING

In anticipation of performing an IRM to address the tar vault, Honeywell has completed the following preparatory activities:

Contractor Technical Input: During Fall 2018 and Winter 2019, Honeywell prequalified and solicited proposals from remedial contractors to remediate the tar vault. The proposed approaches identified significant engineering challenges and schedule uncertainties related to removal of the tar fraction which is not pumpable. The IRM approach presented in Section 2 takes this input into consideration and achieves a protective IRM that will have a shorter and

more certain schedule, will require less intrusive building modifications, and will be less disruptive to building operations and surrounding property uses.

New York City Department of Environmental Protection (NYCDEP) Water Quality Control Application: In February 2019 Honeywell submitted a permit application to NYCDEP for discharge of treated vault dewatering water to the New York City combined sewer. NYCDEP requested updated sampling and analyses of the vault water contents in March 2019, which was performed in May 2019. Analytical results will be submitted to NYCDEP and the permit finalized prior to start of remedial construction.

Access: Honeywell has initiated discussions with the building owner and an adjoining property owner to obtain access to complete the remediation.

These preparatory activities have informed the development of this workplan, as described herein.

SECTION 2
REMEDIAL ACTION

2.1 IRM OBJECTIVES

The specific objectives of the Tar Vault IRM are as follows:

- Perform a remedy that is protective of human health and the environment, including a remedy that:
  - Addresses potential exposures to the tar through direct contact or tar-related vapors.
  - Can be conducted in a manner that controls odors and is protective to building occupants.
- Perform a remedy that is implementable, including a remedy that:
  - Is based on clearly defined and achievable endpoints.
  - Is capable of being performed within tight constraints, both within and outside of the building.
  - Provides a degree of schedule certainty, and minimizes disruption of commercial activities within the building.

This IRM also meets the general NYSDEC requirements to provide better protection of public health and the environment, in the following manner:

- Provides a higher degree of protection to the building tenants;
- Minimizes the potential migration of tar contents from the vault and into the surrounding environment.

2.2 DESCRIPTION OF IRM

2.2.1 Overview

The proposed approach for the IRM consists of the following primary elements:

- Establishment of ventilation within the vault and the building.
- Removal and treatment of overlying water prior to discharge to POTW.
- Removal of freely pumpable tar.
- Incorporation of concrete or a similar pozzolanic product into the remaining tar to enhance stability.
- Installation of a lower barrier consisting of a 32-mil geotextile fabric and a 60-mil elastomeric spray-on coating.
- Installation of an upper barrier over the lower barrier consisting of 4 to 6 inches of fiber-reinforced concrete.

Many of the tasks included in this remedy can be achieved using remote methods, reducing the need for worker entry into the vault. The overall estimated duration of remedial construction to complete this IRM is approximately 12 weeks. Specific elements of the IRM are outlined in the sections below; these elements will be refined during IRM implementation based on the specific means and methods of the selected contractor.

2.2.2 Site Control and Other Protective Measures

Site control measures shall be established prior to the initiation of the IRM, including the establishment and maintenance of exclusion zones, traffic control measures and measures to protect the building and associated surfaces.

Exclusion zones will be established within building interior and exterior locations, at access points to the vault, and where temporary odor control and water treatment units will be installed. The proposed locations for these units will be in the Sigourney Street alleyway, adjacent to the building's northern exterior, and along a portion of the Smith Street sidewalk on the northeast side of the building, as shown on **Figure 2**. In order to provide direct access to the vault interior, the basement windows on the northeast side of the building and the masonry in the blocked-up window wells in the north portion of the building basement will be temporarily removed. Temporary barriers will also be installed along a portion of the Sigourney Street alleyway to demarcate the temporary water treatment and vapor treatment units and establish driving lanes for commercial vehicles during the remediation process. Exclusion zones will also be established within the building interior to protect building occupants from inadvertent entry to work areas.

Traffic control measures will also be implemented, including provisions to prevent vehicular and pedestrian traffic from inadvertently entering the work areas. Temporary traffic barriers will be installed along Smith Street and along the Sigourney Street alleyway to divert vehicle and pedestrian traffic from the work areas. These measures will be completed in accordance with a traffic control plan that will be submitted to the New York City Department of Traffic (NYC DOT) for review and approval. The traffic control plan will also include the installation of all applicable signs, lights, and traffic barriers.

Measures for the protection of the building and its interior surfaces will also be implemented. Specific measures will include the following:

- Preparation of a prework site conditions report
- Implementation of a protective measures plan, including installation of materials such as ram board
- Development and implementation of a fire prevention plan in accordance with NFPA requirements

Specification 02010 in **Appendix C** provides further details regarding the proposed approach; this approach may be modified based on contractor-specific means and methods or the need for adaptive management to meet objectives.

2.2.3 Ventilation and Odor Control

The vapor/odor control system will consist of blowers or fans supplying outside air and positive ventilation to the first floor of the building, along with similar units drawing air from within the tar vault, such that ventilation air is positively pressurized from the first floor down into the vault and exhausted from the vault. Exhaust air will be run through vapor phase activated carbon units which will be placed in the Sigourney Street alleyway, adjacent to the building's northern exterior, as shown on **Figure 4**. The activated carbon units will be monitored for breakthrough of volatile organic constituents and odors and replaced as required. The building ventilation system and odor control will be maintained in operation for the duration of activities that disturb tar or the overlying water, and until the barrier is in place.

Specification 02050 in **Appendix C** provides further details regarding the proposed approach; this approach may be modified based on contractor-specific means and methods or the need for adaptive management to meet objectives. Information regarding the Community Air Monitoring Plan (CAMP) is provided in Section 4.

2.2.4 Vault Dewatering

Removal of the water overlying the tar is a precursor to tar removal. During the IRM planning phase, samples of the vault water were collected and analyzed to evaluate the feasibility of discharging the vault water into to the combined sewer system that runs along the front of the building on Smith Street. The water samples were analyzed for the parameters specified by the New York City Department of Environmental Protection (NYCDEP) Wastewater Quality Control Application (WQCA) discharge permit requirements. The analytical results of the vault water samples indicated that the detected parameters are below the limitations for effluent to the combined sewer systems specified by NYCDEP. NYCO Environmental & Dewatering Corp. (NYCO) was retained to complete the applicable WQCA discharge permit application. The anticipated WQCA permit includes a number of discharge conditions, including the following:

- Maximum pumping rate of 180,000 gallons per day (GPD) or 125 gallons per minute (GPM);
- Prohibition of water discharge to the NYC DEP sewer system during rainfall events, which will reduce the hydraulic capacity of the combined sewer system.

A water treatment system consisting of water pumps, filters, settling tank, and liquid phase carbon units will be used to treat the vault water prior to discharge to the adjacent sewer system. The water treatment system will be installed in the Sigourney Street alleyway on the northern exterior of the 610 Smith Street building, as shown on **Figure 4**. The treatment system's sewer connection will be located within the building, and will tie into the sewer lateral which drains to the combined sewer along Smith Street.

Specification 02040 in **Appendix C** provides further details regarding the proposed approach; this approach may be modified based on contractor-specific means and methods or the need for adaptive management to meet objectives.

2.2.5 Tar Removal

Following removal of overlying water, freely pumpable vault contents (i.e., overlying water unsuitable for discharge to the sewer, tar, tar-like materials) will be removed from the vault and transferred to tank trucks for off-site re-use or disposal. Reasonable efforts to maximize the removal of tar will be made based on conditions encountered, which could include heating the tar to reduce viscosity and improve pumpability.

Specification 02070 in **Appendix C** provides further details regarding the proposed approach; this approach may be modified based on contractor-specific means and methods or the need for adaptive management to meet objectives.

2.2.6 Installation of Barrier System

A cross-section of the proposed barrier system in shown on **Figure 5**. Following the removal of freely pumpable tar, approximately 100 cubic yards of concrete or a similar pozzolanic product will be placed within the vault, and pressed into and intermixed with the remaining tar using a walk-behind manual compactor or similar equipment to enhance stability. It is anticipated that the concrete would be conveyed into the vault with a reinforced flexible hose.

A composite membrane system will be installed on top of the concrete/tar layer. This system would consist of a geotextile fabric and a spray-on coating. A 32-mil geotextile fabric would be placed directly on top of the tar/concrete layer. The spray-on flexible coating would then be applied on top of the geotextile fabric to create at least a 60-mil thick membrane and will seal at termination points around columns and at walls. Following installation of the composite membrane system, a 4 to 6-inch layer of fiber-reinforced flowable concrete will be installed on top of the composite membrane. The concrete mix would be pourable, self-leveling, and free of large aggregate. The fiber-reinforced concrete would cover the composite membrane and provide a barrier to migration of tar-related constituents.

2.2.7 Demobilization

Following completion of remedial activities, equipment will be demobilized from the site, including water recovery and treatment equipment and ventilation and odor control equipment. Temporary barriers and materials will be removed from the exclusion zones along Smith Street and the Sigourney Street alleyway, and concrete blocks will be re-installed in the basement window openings along Smith Street. Building surfaces will be cleaned as required in accordance with Specification 02010.

SECTION 3
ALTERNATIVES CONSIDERED

3.1 TAR REMOVAL

The IRM presented in Section 2 calls for the removal of freely pumpable vault contents (i.e., overlying water unsuitable for discharge to the sewer, tar, tar-like materials), incorporation of concrete or a similar pozzolanic product into the remaining tar to enhance stability, and the installation of a barrier system consisting of a 60-mil sprayed-on geomembrane lower barrier, and a 4 to 6-inch fiber-reinforced concrete upper barrier. This approach is protective of human health and the environment, reduces the need for workers to be in the vault, will require approximately 12 weeks to complete, and meets the IRM objectives described in Section 2.1.

An alternative to this approach was also evaluated, which called for the removal of all tar from the vault, including tar that is not pumpable. This alternative was evaluated, including taking into consideration technical input from remedial contractors. Feedback from remedial contractors identified significant engineering and implementation challenges associated with removal of the tar from the vault which is not pumpable, which would necessitate significant scraping and agitation of the vault walls and floor. These challenges include:

- Required equipment access and associated building modifications. Some of the building modifications proposed by remedial contractors to insert bobcats, skid steers, or similar equipment into the vault to scrape the vault floor for a full removal scenario included cutting though the building foundation at the corner of Smith and Sigourney Streets to create a ramp into the vault, and cutting large holes in the building's first floor to crane in this type of equipment. The ability of the building to structurally tolerate these types of modifications is unknown, and they would increase an already extensive schedule. Moreover, the use of this type of equipment within the vault would require care and diligence to protect the structural columns within the vault.
- The potential for obstructions such as heating coils and curbs in the vault floor, which would make it infeasible to scrape tar that is not freely pumpable.
- The unknown condition of the vault walls and floor, which caused remedial contractors to limit the aggressiveness of agitation to remove tar over concern of causing wall or floor damage.
- Need for barrier. Under any plausible remedial scenario, it would be expected that some tar would remain in the vault following the IRM and some form of barrier would be required.
- Extensive duration. A remedial approach aimed at full removal of tar would require an extensive construction duration (i.e., 14 to 20 weeks) with a significant degree of uncertainty associated with that duration, and an equal degree of uncertainty in achieving the objective. The extended duration would exacerbate potential impacts to commercial operations at the building, including noise, odors, obstruction and impediments to building access.

Based on these factors, tar that is freely pumpable will be removed from the vault, concrete or a similar pozzolanic material will be incorporated into the remaining tar, and an overlying barrier system installed as described in Section 2. This approach achieves a protective IRM that will have a shorter and more certain schedule, will require less intrusive building modifications, and will be less disruptive to building operations and surrounding property uses.

3.2 BARRIER SYSTEM

The barrier system consists of three components, as shown on **Figure 5**:

- Base Layer. Concrete or a similar pozzolanic product will be incorporated into the tar remaining in the vault to enhance stability.
- Lower Barrier Layer. A lower barrier layer to provide a secondary seal between the tar-related constituents and the overlying water.
- Upper Barrier Layer. An upper barrier layer to provide a primary seal between the tar-related constituents and the overlying water.

Selection of materials for each of these components is discussed below.

3.2.1 Base Layer

Several material were considered for incorporation into the tar to enhance stability, including the following:

- Stone (e.g., ¾-inch)
- Concrete or similar pozzolanic product

Based on the ability to more easily distribute a concrete slurry within the vault, as well as the ability of concrete to harden and form a more stable matrix that could better reduce potential mobility of tar remaining in the vault, concrete or a similar pozzolanic product was selected. Depending on conditions encountered in the vault, stone may be used in addition to concrete, in consultation with NYSDEC.

3.2.3 Lower Barrier Layer

A number of materials were evaluated for the lower barrier layer, including the following:

- Rolled membrane. Use of this material would require sealing of seams, sealing at the vault wall, and coordination with the columns within the vault that support the main floor, including cutting around the columns and installing boots to seal the geomembrane to. Based on the constrained nature of the vault and the need for multiple edge seals, the installation of rolled geomembrane would be labor and QC intensive.
- Spray-on membrane. Spray-on coatings can form membranes that are capable of accommodating irregularities in the surface on which they are applied on. Spray-on coatings can provide membranes with right-angled edges to provide adequate contact with walls and columns. Use of spray-on coatings would allow for sealing of inaccessible spots around irregular edges and corners at the walls and around the columns. In addition, they

can intrude into the pores, holes, and pits within the surface on which they are applied, providing a strong adhesion to the surface.

Based on the constrained nature of the vault and the number of edges that would require sealing (i.e., walls and columns), a spray-on membrane system consisting of geotextile fabric and a 60-mil spray-on elastomeric flexible sealant was selected for incorporation into the IRM.

3.2.2 Upper Barrier Layer

A number of materials were evaluated for the upper barrier, including several types of concrete materials. Flowable concrete mix was found to be a suitable candidate for this barrier. Flowable concrete mixes have the ability to be poured and self-leveling, forming a slab of uniform thickness with minimum labor interference. These mixes can be made with low permeability and can be made to acquire cure within a reasonable time period. Fiber reinforcement would be added to the concrete layer to resist generation of cracks within the concrete.

SECTION 4
HEALTH AND SAFETY PLANNING

4.1 HEALTH AND SAFETY PLAN (HASP)

The selected remedial contractor shall prepare a Site-Specific Health and Safety Plan (HASP) in accordance with the requirements of 29 CFR 1910.120 and/or 29 CFR 1926.65, and other applicable OSHA regulations and published guidelines. The Health and Safety Plan will include procedures for various specialty operations including, but not limited to the following:

- Confined space entry
- Scaffolds and ladders
- Fall prevention and working at heights
- Hot work (if required)

The HASP shall also provide for regular atmospheric monitoring at work zones to determine the site workers level of protection (i.e. Level D, Modified Level D, or Level C). At a minimum, testing will be conducted for VOCs, carbon monoxide, hydrogen sulfide, oxygen, methane, and explosive atmospheres. All equipment placed into the vault or handling atmosphere from the vault shall be intrinsically safe for the location that it is used in and for a specific use with a Class IIIA combustible liquid in accordance with NFPA 70.

The Health and Safety Plan will be provided to NYSDEC prior to mobilization.

4.2 COMMUNITY AIR MONITORING PROGRAM (CAMP)

A Community Air Monitoring Program (CAMP) will be implemented for the IRM of the tar vault per New York State Department of Health (NYSDOH) guidance provided in DER-10 (**Appendix D**). The CAMP describes the air quality monitoring to be performed during the tar vault IRM work at 628 Smith Street in Brooklyn, New York. The purpose of the CAMP is to conduct real-time air monitoring to confirm that the community is not adversely impacted during activities associated with the IRM activities.

SECTION 5
REPORTING

All site activities will be documented appropriately. This will include the following information daily during site activities:

- On-site personnel
- Date of work
- Photo documentation of material and on-site activities
- Quantities of materials transported off site
- Issues or concerns

Weekly reports will be prepared during site activities. The weekly reports will describe significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

Following completion of the project's activities, a construction completion report will be prepared consistent with Section 5.8 of DER-10, including:

- A description of the remedy, as constructed, pursuant to the IRM Work Plan
- A summary of all remedial actions completed, including:
    - A description of any problems encountered during construction and a description of their resolution.
    - A description of changes to the design documents and a description as to why the changes were made.
    - A listing of waste streams, quantity of materials disposed and facility where such materials were disposed.
    - Restoration activities
- A list of the remedial action objectives applied to the remedial action
- "As-built" drawings bearing a NYS professional engineer's stamp and signature on each drawing, any permanent structures including, without limitation, caps, slurry walls, treatment units or other remedial structures which will remain in place after completion of the remedial action, as well as to document areas of changed conditions or removals, as well as mitigation measures in place to address exposures related to vapor intrusion.

SECTION 6
PROPOSED PROJECT SCHEDULE

The proposed project schedule is provided as **Figure 6**. This schedule is dependent upon timely review and approval of the applicable project permits and work plans. This schedule also includes a provision for a public comment period and response, to be conducted by NYSDEC.

FIGURES

Figure 1 **Location of Block 492, Lot 20, and Tar Vault at 628 Smith Street**

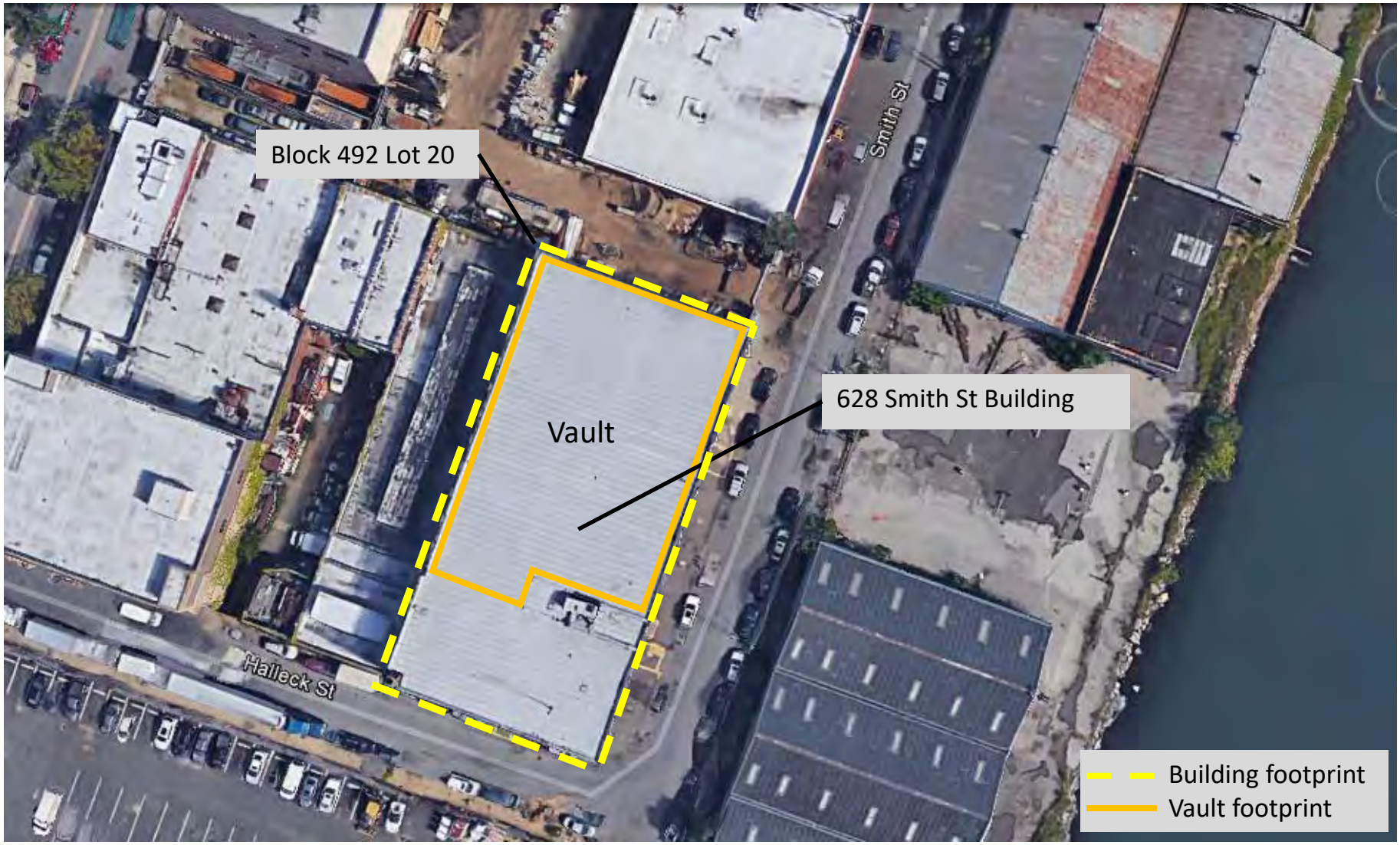
Figure 2 **First Floor Plan for 628 Smith Street Building**

Figure 3 **Tar Vault Cross Section (Typical)**

Figure 4 **Equipment Layout**

Figure 5 **Proposed IRM Barrier System**

Figure 6 **Tar Vault IRM Draft Schedule**



Honeywell

Figure 1. Location of Block 492 Lot 20 and Tar Vault at 628 Smith Street

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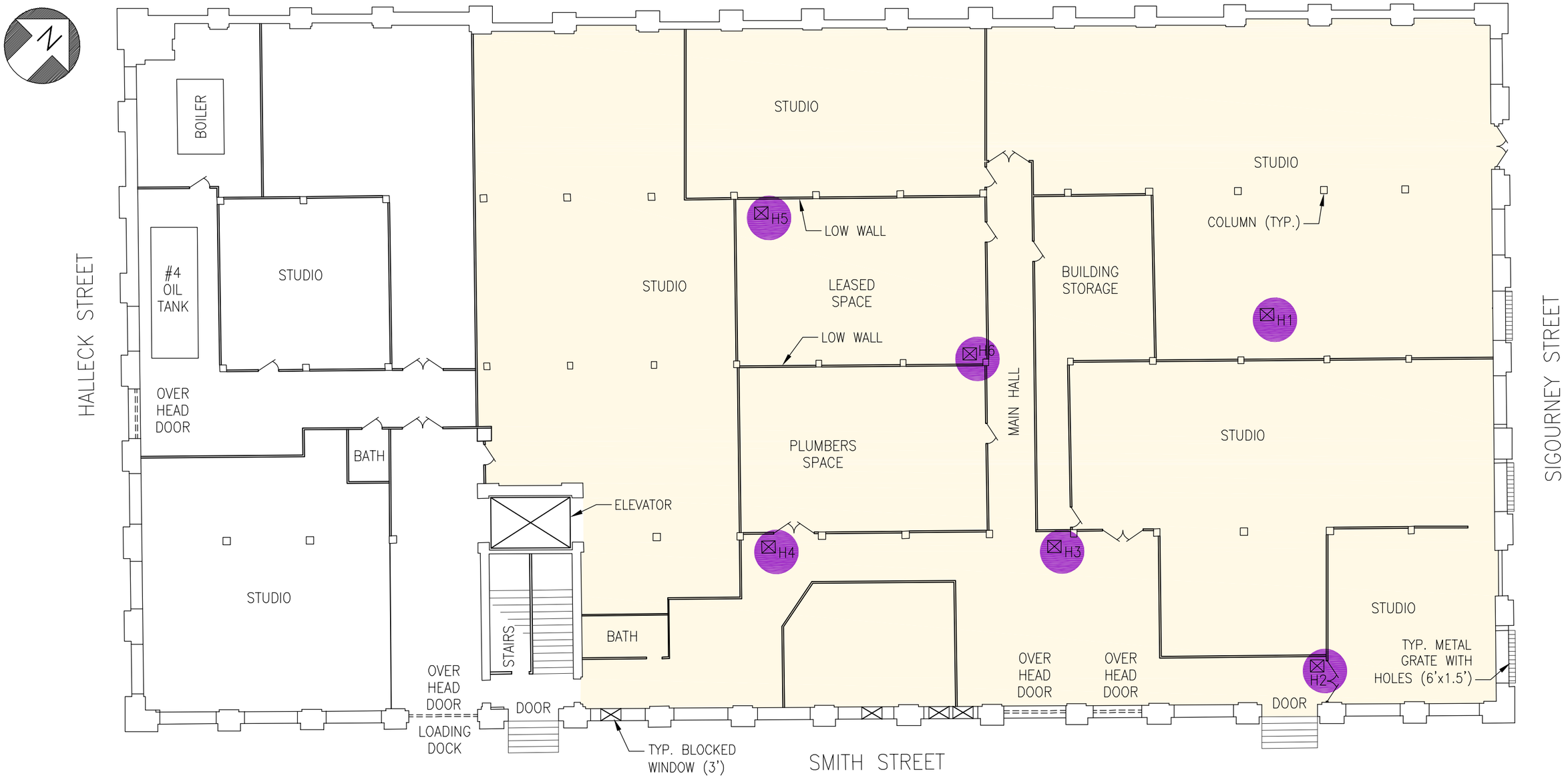

LEGEND:

- H2 — EXISTING HATCH
- TYPICAL BLOCKED WINDOW (3')
- TYPICAL METAL GRATE WITH HOLES (6'x1.5')
- APPROXIMATE EXTENT OF VAULT BELOW FIRST FLOOR

NOTE:

BUILDING LAYOUT AND INTERIOR COLUMNS WERE TAKEN FROM A 1946 ARCHITECTURAL "FIRST FLOOR PLAN" BY JUDSON E. SCHNALL & MAXFIELD BLAUFEAX ARCHITECTS. MEASUREMENTS OF INTERIOR WALLS AND OTHER FEATURES MADE USING ENGINEERS TAPE ON APRIL 19, 2017.
ALL DIMENSIONS ARE APPROXIMATE.

NO.	DESCRIPTION	DATE	DRAWN	CHK'D	APPV'D
C	REVISED	01/30/19	RR	CFB	–
B	REVISED	02/20/18	RR	PFM	–
A	ISSUED FOR COMMENT	05/03/17	RR	PFM	–

PARSONS
ENVIRONMENT & INFRASTRUCTURE
100 HIGH ST, 4TH FL
BOSTON, MA 02110
(617) 946-9400

DRAWN BY: RR | CHECKED BY: PFM
DATE: 05-03-17 | APPROVED BY: PFM

DRAWING TITLE: Honeywell
1ST FLOOR PLAN FOR 628 SMITH STREET BUILDING

DRAWING NO.: C-001
SCALE: 1" = 15'
JOB: 450881-01102

FILE NAME: P:\PIT\PROJECTS\HONEYWELL\SMITH STREET – BROOKLYN NY\CAD\AUTOCAD\TAR WELL IRM\FIGURE 2.DWG
PLOT DATE: 7/9/2019 12:31 PM PLOTTED BY: RABUFFETTI, RICH

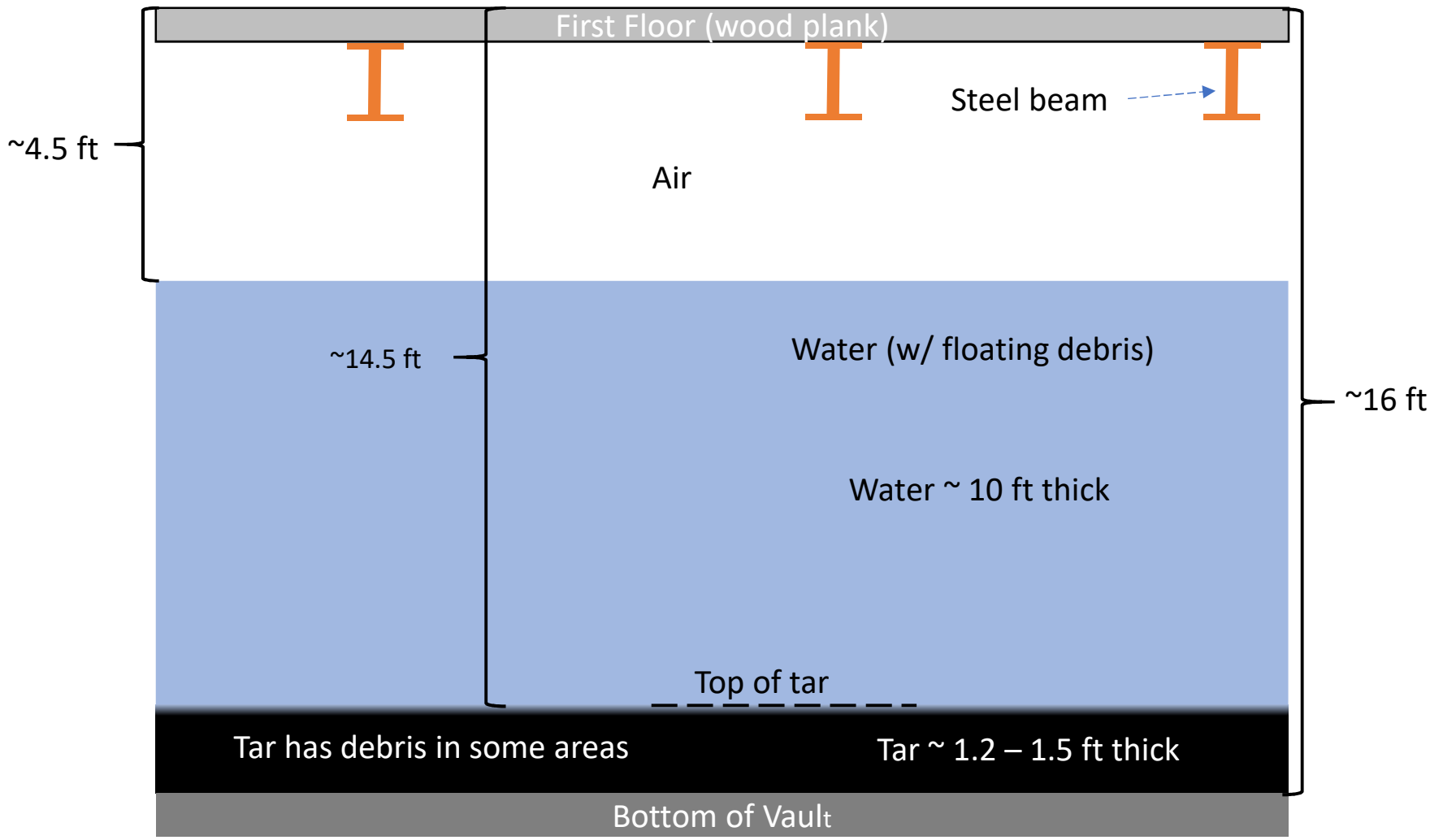

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Figure 3. Tar Vault Cross-section (typical)

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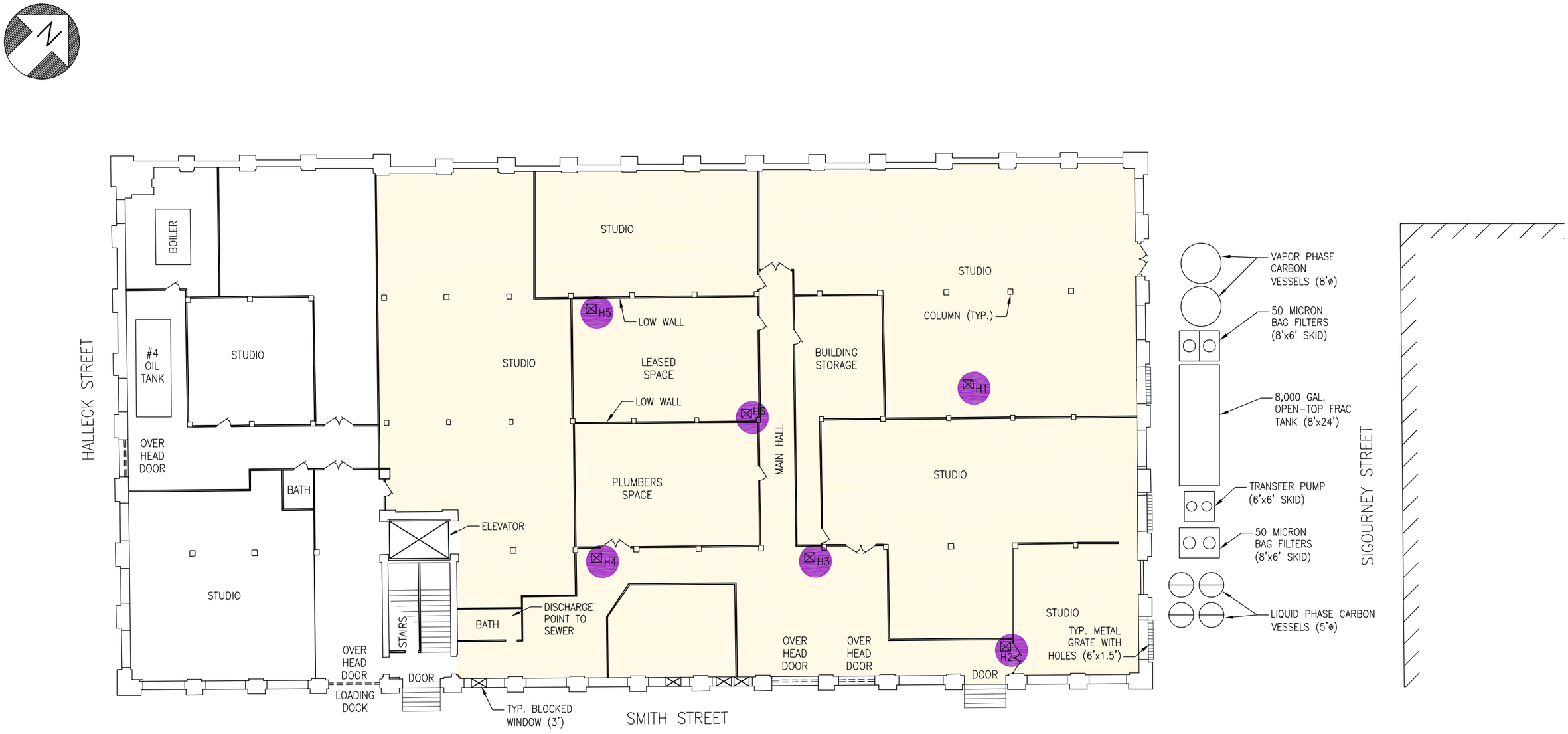

20 10 0 20 40

APROX. SCALE: 1" = 20'

LEGEND:

- H2 — EXISTING HATCH
- TYPICAL BLOCKED WINDOW (3')
- TYPICAL METAL GRATE WITH HOLES (6'x1.5')
- APPROXIMATE EXTENT OF VAULT BELOW FIRST FLOOR

NOTE:

BUILDING LAYOUT AND INTERIOR COLUMNS WERE TAKEN FROM A 1946 ARCHITECTURAL "FIRST FLOOR PLAN" BY JUDSON E. SCHNALL & MAXFIELD BLAUFEAX ARCHITECTS. MEASUREMENTS OF INTERIOR WALLS AND OTHER FEATURES MADE USING ENGINEERS TAPE ON APRIL 19, 2017.
ALL DIMENSIONS ARE APPROXIMATE.

NO.	DESCRIPTION	DATE	DRAWN	CHK'D	APPV'D
D	REVISED	02/27/19	RR	CFB	–
C	REVISED	01/30/19	RR	CFB	–
B	REVISED	02/20/18	RR	PFM	–
A	ISSUED FOR COMMENT	05/03/17	RR	PFM	–

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ENVIRONMENT & INFRASTRUCTURE
100 HIGH ST, 4TH FL
BOSTON, MA 02110
(617) 946-9400

DRAWING TITLE: Honeywell
EQUIPMENT LAYOUT

DRAWN BY	CHECKED BY
RR	PFM
DATE	APPROVED BY
05-03-17	PFM

DRAWING NO.: FIGURE 4
SCALE: 1" = 20'
JOB: 450881-01102

FILE NAME: P:\PIT\PROJECTS\HONEYWELL\SMITH STREET – BROOKLYN NY\CAD\AUTOCAD\EQUIPMENT LAYOUT\FIGURE 4.DWG
PLOT DATE: 7/9/2019 12:42 PM PLOTTED BY: RABUFFETTI, RICH

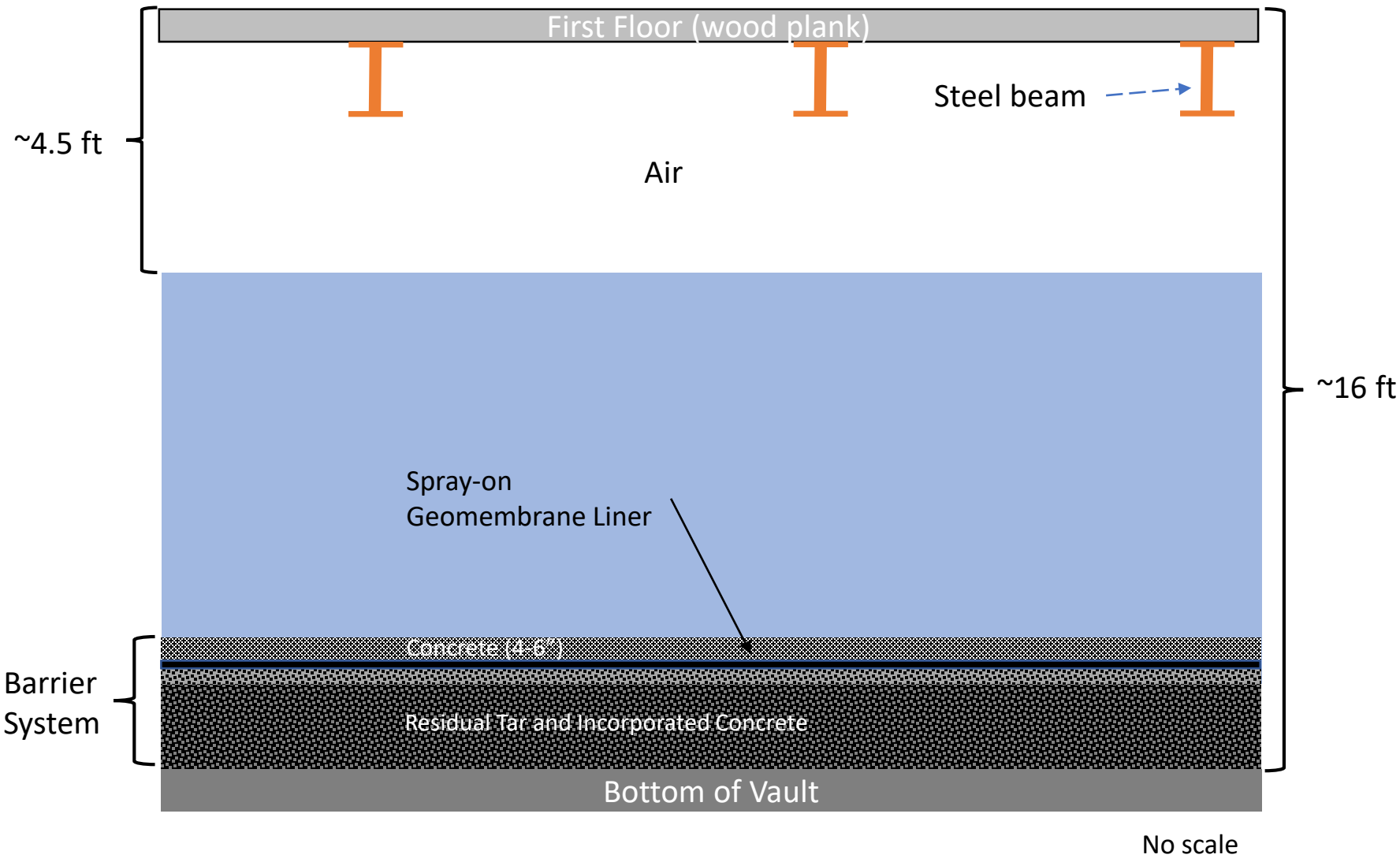

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Figure 5. Proposed Barrier System

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FIGURE 6
TAR VAULT IRM DRAFT SCHEDULE

	MAY				JUN				JUL					AUG				SEP					OCT				NOV				DEC					JAN			
	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27
Develop IRM Work Plan																																							
NYSDEC Review IRM Work Plan																																							
Finalize IRM Work Plan, NYSDEC Approve																																							
Public Comment Period																																							
Retain Remedial Action Contractor																																							
Remedial Action Contractor Obtain Permits																																							
Mobilization, Preparation																																							
Remedial Construction																																							
Demobe																																							

Notes:
1. Schedule subject to regulatory approvals
2. Duration of construction estimated (12 weeks); actual will be determined based on final scope and contractor means and methods.

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SEPTEMBER 18, 2019

APPENDICES

Appendix A **Tar Vault Investigation Summary**

Appendix B **Vault Headspace Air Data**

Appendix C **Technical Specifications**

Appendix D **Community Air Monitoring Plan (CAMP)**

APPENDIX A

TAR VAULT INVESTIGATION SUMMARY

Honeywell

Health, Safety, Environment, & Product Safety
6100 Philadelphia Pike
Claymont, DE 19703

August 8, 2018

William Wu
Environmental Engineer
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway, Floor 11
Albany, NY 12233-7014

Subject: Tar Vault Investigation Report
610 Smith Street Site
NYSDEC BCP Site #C224215

Dear Mr. Wu,

Pursuant to the Brownfields Cleanup Agreement (BCA) with 610 Smith St. LLC, attached is a Technical Memorandum describing the results of the investigation of the tar vault at the building at 628 Smith Street, Brooklyn, New York. The purpose of the investigation was to gather information on the configuration of the vault and the extent and chemical characteristics of the material remaining in the vault. Based on the results of the investigation, Honeywell will coordinate with the property owner, initiate steps to retain a remedial contractor, and develop a plan and schedule to remove the tar from the vault. Towards that end, Honeywell would like to discuss the regulatory framework for the removal with the Department.

If you have any questions in regards to the information provided herein, please contact me at 302-791-6738.

Regards,

Steve Coladonato
Honeywell

cc: Andrew Gugielmi, Esq., NYSDEC Office of General Counsel (letter only)
Gardiner Cross, NYSDEC Section Chief
Krista Anders, NYS Department of Health
Jeremy Karpatkin, Esq., Arnold & Porter LLP
James O'Loughlin, Parsons
Paul Feshbach-Meriney, Parsons

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TECHNICAL MEMORANDUM

Tar Vault Investigation Summary

628 Smith Street Building, NYSDEC BCP Site #C22415

Brooklyn, New York

This memorandum presents the results of an investigation to assess the configuration of, and the physical/chemical characteristics of material remaining in, the vault at 628 Smith Street, Brooklyn, New York (Figure 1). This information was collected to evaluate a remedial approach to manage the contents of the vault.

This site work was conducted in accordance with a Vault Investigation Work Plan dated June 2, 2017, that is a supplement to the original NYSDEC-approved draft Site Characterization Work Plan (SCWP) for the former Barrett Manufacturing and Mica Roofing Sites, Brooklyn, New York. In addition, the investigation of the vault was conducted under the applicable portions of the NYSDEC-approved SCWP, Quality Assurance Project Plan (QAPP), and the Project Safety, Health, and Environmental Plan (PSHEP). The field investigation was conducted between February 12 and 16, 2018.

Previous limited assessments of the vault through one of the hatches were conducted in 2016 and 2017; relevant results from those assessments are incorporated herein.

Scope of Work

A floor plan illustrating the location of the vault, and six hatches installed to access the vault, is attached as Figure 2; an approximate cross section of the vault is attached as Figure 3. The scope of work for the investigation included the following:

- Video inspection at six locations to observe the configuration and physical construction of the tar vault;
- Collection of water samples at two locations;
- Measurements to determine vault configuration and water/tar depths and thicknesses;
- Collection of tar for physical properties analyses at six locations and chemical analyses at three locations; and
- A survey of the 628 Smith Street building corners and the hatches including locations and elevations.

The scope of work and observations made are summarized on Table 1. Due to tenant use of the space, limited access was available to Hatch 1 in February 2018. However, the results from the 2016 and 2017 assessments of the vault that were conducted through that hatch were used to supplement the results of the investigation.

Air Monitoring and Venting

During the tar vault investigation, monitoring of air in the work zone at each hatch was continuously performed using a 5-gas MultiRae Plus meter. Monitoring for VOCs, carbon monoxide, oxygen, hydrogen sulfide, and methane as % LEL was performed at the start of work at each hatch. Calibration spot checks were performed using calibration gas at the beginning of each day to confirm that the instrument was working within acceptable limits. Monitoring results indicated that there were no measured concentrations of VOCs above the Action Level of 1 ppm as specified in the HASP. There were also no elevated levels of

% LEL, carbon monoxide, or hydrogen sulfide observed at any hatch locations through the week, and oxygen levels remained at 20.9%.

When collecting tar samples at each hatch, venting of indoor air to the exterior of the building was performed as an engineering control to limit odors generated during the work and after working with the tar samples to remove residual odors. Venting of air was performed using a 16-inch Allegro Ventilation Blower Model 9515-01 with an air flow capacity of 2,900 cfm. The blower exhaust duct was positioned to vent the air out of the building at the loading dock doorway, while up to 125 feet of 16-inch flexible hose duct was moved to each hatch location as required to perform the work.

Photographs of the monitoring equipment and venting set up are provided in Attachment A.

Video Inspections

360-degree video investigations were conducted at five of the six hatch locations (Hatches 2 through 6) on February 13, 2018. Access to Hatch 1 was limited as described above; however, a video inspection was previously recorded at Hatch 1 on April 19, 2017.

As shown on the photographs in Attachment B, the video inspections documented a grid of steel beams that support the 1st floor wood plank subfloor and plywood flooring. The steel beams were typically supported by concrete columns which extend to the base of the vault, but in the vicinity of Hatch 4, wooden columns were observed. In the vicinity of Hatch 2, what appeared to be a supplemental steel beam was observed. The visible sides of the vault above the water appeared to consist of concrete and brick.

Collection of Water Samples

On February 12, 2018, water samples were collected from the vault at Hatches 3 and 5. The samples were collected from the midpoint of the water column at each hatch, using ¼ -inch diameter polyethylene tubing connected to a peristaltic pump (Table 1). The open end of the tubing was inserted into a 2-inch diameter PVC pipe so that the appropriate vertical distance (depth to midpoint) could be obtained for sampling. Analytical results are summarized in Table 2.

Measurements of Depths, Observation, and Obstructions

Measurements of depths to water and tar, measurements of tar thickness, and observations of trash and debris were noted during the inspection of each hatch. An oil water interface probe was used to measure the depth of water and the depth to tar/debris from a measuring point on the lip of each hatch. In addition, a 5/8-inch steel tile probe was used to probe the bottom of the vault (i.e., depth to the bottom) at the each of the four corners of the individual hatches. Physical stratification of the tar (i.e., difference in consistency) was not detected during the probing. The tile probe was also used to identify debris that may be present at each of the hatch locations. Hatches 2 through 6 were investigated during the February 2018 event, as access to Hatch 1 was limited as described above; however, assessment of tar at Hatch 1 using different methods was previously performed on March 18, 2016.

A significant amount of debris was observed floating on the surface of the water at several of the hatches. Additionally, a large amount of debris was observed to be present in and around the water and tar interface. This debris made it difficult to determine the boundary between the water and tar using the interface probe. Because of this condition, multiple methods where used to assign the depth to tar and the depth to bottom of the vault at each location. A brief discussion of the findings at each of the hatches is presented in Attachment C; the results are summarized in Table 1. In general, approximately 10 ft of water was observed to overlie approximately 1.2 to 1.5 ft of tar within the vault.

Collection of Tar Samples

Between February 13 and February 15, 2018, tar samples were collected at Hatches 2 through Hatch 6 for the purposes of assessing the chemical characteristics and physical properties of the tar as described in Table 1; results are summarized on Tables 3 and 4, respectively. During the February 2018 sampling event, tar samples could not be obtained from Hatch 1 as described above; however, limited sampling of tar at Hatch 1 was previously performed on March 18, 2016 and those results are also included on Tables 3 and 4.

Tar samples were collected using a variety of methods including a sludge judge sampler and 2-inch PVC pipe with a retractable stopper at the end. The tar was of a similar black color at all locations. The consistency of the tar recovered by the samplers was generally uneven, with some congealed blobs among the more fluid tar.

Survey of Hatches

On February 14, 2018, Chazen Surveyors conducted survey activities to locate all four corners of the 628 Smith St. Building. The building corners were surveyed for the northings/eastings and the ground surface elevations where accessible, with Corner 1 (C1) being the northwesterly-most corner, Corner 2 (C2) the northeasterly-most corner, Corner 3 (C3) the southeasterly-most corner, and Corner 4 (C4) the southwesterly-most corner. Each of the four corners of Hatches 2 through 6 were also surveyed and labeled C1 to C4 in the same configuration as the building corners. Due to tenant use of the space, only the center of Hatch 1 was surveyed.

Tables

Table 1 Tar Vault Investigation summary
Table 2 Water Chemical Characteristics
Table 3 Tar Chemical Characteristics
Table 4 Tar Physical Properties

Figures

Figure 1 Location Map
Figure 2 1st Floor Plan for 628 Smith St. Building
Figure 3 Cross Section of Tar Vault and Typical Hatch

Attachments

Attachment A Air Monitoring and Ventilation Set-up
Attachment B Vault Photographs
Attachment C Vault Observation Summary

Table 1
Tar Vault Investigation Summary
628 Smith Street
Brooklyn, New York

Activity/Results	Hatch 1	Hatch 2	Hatch 3	Hatch 4	Hatch 5	Hatch 6
Summary of 2018 Investigation Scope						
Video Survey (360 degrees)	Yes (4/19/2017)	Yes (2/13/2018)	Yes (2/13/2018)	Yes (2/13/2018)	Yes (2/13/2018)	Yes (2/13/2018)
Water Sample	Yes (1/15/16, 3/18/16)	No	Yes (2/12/2018)	No	Yes (2/12/2018)	No
Water Sample Depth (ft)	N/A	N/A	9.5	N/A	9.0	N/A
NAPL Sample - Physical	Yes (3/18/16)	Yes	Yes	Yes	Yes	Yes
NAPL Sample - Chemical	Yes (3/18/16)	No	Yes (2/15/2018)	Yes (2/14/2018)	Yes (2/13/2018)	No
Survey of Hatch	Yes (center floor only)	Yes	Yes	Yes	Yes	Yes
Depths and Thickness of Water and Tar						
Depth to Water (ft)	4.6	4.48	4.56	4.45	4.48	4.50
Depth to Top of Tar (ft)	N/A	14.53	14.40	14.40	14.50	14.50
Estimated Depth to Bottom of Vault (deepest) (ft)	N/A	15.76	15.66	15.82	15.87	15.90
Depth at Corner 1	N/A	15.68	15.55	15.64	15.77	15.90
Depth at Corner 2	N/A	15.32	15.45	15.76	15.87	15.57
Depth at Corner 3	N/A	15.48	15.66	15.82	15.82	15.60
Depth at Corner 4	N/A	15.76	15.60	15.53	15.68	15.90
Estimated Thickness of Water (ft)	~10.0	10.05	9.84	9.95	10.02	10.00
Estimated Thickness of Tar (ft)	N/A	1.23	1.26	1.42	1.37	1.40
Debris and Other Observations						
Debris Detected at Vault Bottom	Based on recent data collected at Hatch 2 through Hatch 6. It is believed that debris was encountered at 13.5' and not NAPL as originally assumed.	An audible vibration sound when contacting bottom was observed.	There was an obstruction encountered at 8' on the north side of the hatch while sampling and it appear to move around.	Debris did not appear to be present in a significant amount.	Pulled up plastic, and plywood that appeared to be sitting on top of the tar layer.	Pulled up plastic, plywood, and a suitcase that appeared to be sitting on top of the tar layer.
Debris Observed in Water	Yes	Yes (e.g., wood, trash, white residue on surface)	Yes (e.g., trash, pipes, white residue on surface)	Yes (e.g., trash, white residue on surface)	Yes (e.g., wood, trash, plastic, white residue on surface)	Yes (e.g., wood, trash, plastic, white residue on surface)
Other Observations	N/A	Resistance observed with the interface probe at a depth of about 13.95 ft.	Resistance observed with the interface probe at a depth of about 14.4 ft.	Resistance observed with the interface probe at a depth of about 14.4 ft.	Resistance observed with the interface probe at a depth of about 13.5 ft. Bubbles were seen while probing.	Resistance observed with the interface probe at a depth of about 13.0 ft. Bubbles were seen while probing.
Survey Elevations						
Hatch Ground Elevation	10.29	10.23	10.31	10.20	10.28	10.27
NW Corner Elev.	N/A	10.18	10.31	10.21	10.28	10.28
NE Corner Elev.	N/A	10.22	10.30	10.17	10.28	10.26
SE Corner Elev.	N/A	10.25	10.31	10.20	10.28	10.27
SW Corner Elev.	N/A	10.23	10.33	10.21	10.28	10.29

Notes:
1) Depth measurements were from first floor.
2) Elevations are relative to North American Vertical Datum of 1988 (NAVD88

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Table 2A
Water Chemical Characteristics - Detected Concentrations of Constituents

					Location ID	HATCH 1		HATCH 1		HATCH3		HATCH5		FIELDQC		HATCH3		HATCH5	
					Field Sample ID	WC011516-TAR WELL-WATER		WC031816TARWELLWATER		H3-W01-02122018		H5-W01-02122018		TB WC031816 TARWELL NAPL		Trip Blank 1		Trip Blank 2	
					Sampled	01/15/2016		03/18/2016		02/12/2018		02/12/2018		03/18/2016		02/12/2018		02/12/2018	
					SDG	JC12751		JC16572		JC60658		JC60659		JC16572		JC60658		JC60659	
					Matrix	WATER		WATER		WATER		WATER		WATER		WATER		WATER	
					Purpose	REG		REG		REG		REG		TB		TB		TB	
					Type	WC		WC		WC		WC		BLKWATER		BLKWATER		BLKWATER	
Method	**Parameter Code**	**Parameter Name**	**Units**	**Leached**															
846-7.3.3.2	REAC-CN	REACTIVE CYANIDE	mg/L	N		10	U	10	U	10	U	10	U						
846-7.3.4.2	REAC-S	REACTIVE SULFIDE	mg/L	N		100	U	100	U	100	U	100	U						
E335.4	57-12-5	CYANIDE	mg/L	N		0.084													
E351.2	KN	NITROGEN, KJELDAHL, TOTAL	mg/L	N						13.9		10.1							
E353.2	NO3NO2N	NITROGEN, NITRATE-NITRITE	mg/L	N						0.20	U	0.20	U						
E420.4	TOTAL_PHENOL	TOTAL PHENOLS	mg/L	N						0.20	U	0.20	U						
E524.2	75-27-4	BROMODICHLOROMETHANE	ug/l	N				0.50	U	0.50	U	0.50	U						
E524.2	75-25-2	BROMOFORM	ug/l	N				0.50	U	0.50	U	0.50	U						
E524.2	67-66-3	CHLOROFORM	ug/l	N				0.50	U	0.50	U	0.50	U						
E524.2	124-48-1	DIBROMOCHLOROMETHANE	ug/l	N				0.50	U	0.50	U	0.50	U						
E524.2	THM	TOTAL TRIHALOMETHANES	ug/l	N				0.50	U	0.50	U	0.50	U						
E1664A	OILGREASE	OIL & GREASE, TOTAL REC	mg/L	N						2.0	J	2.1	J						
SM20-4500-HB	PH	pH	SU	N						7.42		7.25							
SM2540B	TSO	TOTAL SOLIDS	mg/L	N						11300		10500							
SM2540D	TSS	Total Suspended Solids	mg/L	N						1.3	J	4.0	U						
SM4500	TN	TOTAL NITROGEN, ALL FORMS,CALCULATED	mg/L	N						13.9		10.1							
SM5210B	BOD5	BIOCHEMICAL OXYGEN DEMAND, FIVE DAY	mg/L	N						100	U	100	U						
SW1010	IGNITLIQPM	Ignitability (liquids) Pensky-Martens	deg F	N		200		200		200		200							
SW9040	CORROS	CORROSIVITY	SU	N		7.37	J	7.31	J	7.95		8.02							
SW9020	TOX	TOTAL ORGANIC HALIDES (TOX)	mg/L	N						0.096	J	0.20	U						
E200.7	7440-38-2	ARSENIC	ug/l	N		1.9	U												
E200.7	7440-39-3	BARIUM	ug/l	N		0.65	U												
E200.7	7440-41-7	BERYLLIUM	ug/l	N		0.28	U												
E200.7	7440-43-9	CADMIUM	ug/l	N		0.36	U												
E200.7	7440-47-3	CHROMIUM	ug/l	N		0.64	U												
E200.7	7440-50-8	COPPER	ug/l	N		1.5	U												
E200.7	7439-92-1	LEAD	ug/l	N		2.0	U												
E200.7	7440-02-0	NICKEL	ug/l	N		0.48	U												
E200.7	7782-49-2	SELENIUM	ug/l	N		2.9	U												
E200.7	7440-22-4	SILVER	ug/l	N		1.9	U												
E200.7	7440-62-2	VANADIUM	ug/l	N		0.68	U												
E200.7	7440-66-6	ZINC	ug/l	N		3.1	U												
E300.0	16887-00-6	CHLORIDE	mg/L	N				609		5740		5530							
E300.0	16984-48-8	FLUORIDE	mg/L	N				0.20	U	8.0	U	8.0	U						
SW6010	7429-90-5	ALUMINUM	ug/l	N						42.2	J	119	J						
SW6010	7440-36-0	ANTIMONY	ug/l	N						4.3	U	4.3	U						
SW6010	7440-38-2	ARSENIC	ug/l	N				2.2	U	9.6		8.4							
SW6010	7440-39-3	BARIUM	ug/l	N				0.44	U	302		288							
SW6010	7440-41-7	BERYLLIUM	ug/l	N				0.25	U	0.40	U	0.80	J						
SW6010	7440-43-9	CADMIUM	ug/l	N				0.40	U	0.70	U	0.70	J						
SW6010	7440-70-2	CALCIUM	ug/l	N						144000		142000							
SW6010	7440-47-3	CHROMIUM	ug/l	N				0.81	U	6.4	J	6.8	J						
SW6010	7440-48-4	COBALT	ug/l	N						1.0	J	0.72	U						
SW6010	7440-50-8	COPPER	ug/l	N				2.4	U	3.2	U	3.2	U						
SW6010	7439-89-6	IRON	ug/l	N						105		110							
SW6010	7439-92-1	LEAD	ug/l	N				2.3	U	2.6	U	2.6	U						
SW6010	7439-95-4	MAGNESIUM	ug/l	N						375000		368000							
SW6010	7439-96-5	MANGANESE	ug/l	N						877		855							
SW6010	7440-02-0	NICKEL	ug/l	N				0.76	U	3.2	J	2.8	J						
SW6010	7440-09-7	POTASSIUM	ug/l	N						115000		111000							
SW6010	7782-49-2	SELENIUM	ug/l	N				4.1	U	6.6	U	6.6	U						
SW6010	7440-22-4	SILVER	ug/l	N				0.88	U	3.1	U	3.1	U						
SW6010	7440-23-5	SODIUM	ug/l	N						3360000		3300000							
SW6010	7440-28-0	THALLIUM	ug/l	N						8.2	U	8.2	U						
SW6010	7440-62-2	VANADIUM	ug/l	N				0.66	U	6.5	J	5.9	J						
SW6010	7440-66-6	ZINC	ug/l	N				1.3	U	4.0	U	4.0	U						
SW7196	18540-29-9	HEXAVALENT CHROMIUM	mg/L	N		0.010	U	0.016	J	0.01	U	0.018	J-						
SW7470	7439-97-6	MERCURY	ug/l	N		0.069	U	0.047	U	0.083	U	0.083	U						

					Location ID	HATCH 1		HATCH 1		HATCH3		HATCH5		FIELDQC		HATCH3		HATCH5	
					Field Sample ID	WC011516-TAR WELL-WATER		WC031816TARWELLWATER		H3-W01-02122018		H5-W01-02122018		TB WC031816 TARWELL NAPL		Trip Blank 1		Trip Blank 2	
					Sampled	01/15/2016		03/18/2016		02/12/2018		02/12/2018		03/18/2016		02/12/2018		02/12/2018	
					SDG	JC12751		JC16572		JC60658		JC60659		JC16572		JC60658		JC60659	
					Matrix	WATER		WATER		WATER		WATER		WATER		WATER		WATER	
					Purpose	REG		REG		REG		REG		TB		TB		TB	
					Type	WC		WC		WC		WC		BLKWATER		BLKWATER		BLKWATER	
Method	**Parameter Code**	**Parameter Name**	**Units**	**Leached**															
SW8082	12674-11-2	AROCLOR-1016	ug/l	N		0.67	U	0.40	U	0.33	U	0.33	U						
SW8082	11104-28-2	AROCLOR-1221	ug/l	N		0.67	U	0.40	U	0.33	U	0.33	U						
SW8082	11141-16-5	AROCLOR-1232	ug/l	N		0.67	U	0.40	U	0.33	U	0.33	U						
SW8082	53469-21-9	AROCLOR-1242	ug/l	N		0.67	U	0.40	U	0.33	U	0.33	U						
SW8082	12672-29-6	AROCLOR-1248	ug/l	N		0.67	U	0.40	U	0.33	U	0.33	U						
SW8082	11097-69-1	AROCLOR-1254	ug/l	N		0.67	U	0.40	U	0.33	U	0.33	U						
SW8082	11096-82-5	AROCLOR-1260	ug/l	N		0.67	U	0.40	U	0.33	U	0.33	U						
SW8082	37324-23-5	AROCLOR-1262	ug/l	N		0.67	U	0.40	U	0.33	U	0.33	U						
SW8082	11100-14-4	AROCLOR-1268	ug/l	N		0.67	U	0.40	U	0.33	U	0.33	U						
SW8260	71-55-6	1,1,1-TRICHLOROETHANE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	79-34-5	1,1,2,2-TETRACHLOROETHANE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/l	N		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
SW8260	79-00-5	1,1,2-TRICHLOROETHANE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	75-34-3	1,1-DICHLOROETHANE	ug/l	N		1.0	U	1.0	U	0.54	J	0.48	J	1.0	U	1.0	U	1.0	U
SW8260	75-35-4	1,1-DICHLOROETHENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	87-61-6	1,2,3-TRICHLOROBENZENE	ug/l	N						1.0	U	1.0	U			1.0	U	1.0	U
SW8260	120-82-1	1,2,4-TRICHLOROBENZENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ug/l	N		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
SW8260	106-93-4	1,2-DIBROMOETHANE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	95-50-1	1,2-DICHLOROBENZENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	107-06-2	1,2-DICHLOROETHANE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	78-87-5	1,2-DICHLOROPROPANE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	541-73-1	1,3-DICHLOROBENZENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	106-46-7	1,4-DICHLOROBENZENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	78-93-3	2-BUTANONE	ug/l	N		10	U	10	U	10	U	10	U	10	U	10	U	10	U
SW8260	110-75-8	2-CHLOROETHYL VINYL ETHER	ug/l	N		10	U	10	U					10	U				
SW8260	591-78-6	2-HEXANONE	ug/l	N		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
SW8260	108-10-1	4-METHYL-2-PENTANONE	ug/l	N		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
SW8260	67-64-1	ACETONE	ug/l	N		10	U	10	U	10	U	10	U	15.9		10	U	10	U
SW8260	107-02-8	ACROLEIN	ug/l	N		50	U	50	U					50	U				
SW8260	107-13-1	ACRYLONITRILE	ug/l	N		50	U	50	U					50	U				
SW8260	71-43-2	BENZENE	ug/l	N		0.50	U	0.50	U	9.9		2.6		0.50	U	0.50	U	0.50	U
SW8260	74-97-5	BROMOCHLOROMETHANE	ug/l	N						1.0	U	1.0	U			1.0	U	1.0	U
SW8260	75-27-4	BROMODICHLOROMETHANE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	75-25-2	BROMOFORM	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	74-83-9	BROMOMETHANE	ug/l	N		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
SW8260	75-15-0	CARBON DISULFIDE	ug/l	N		2.0	U	2.0	U	12.1		10.4		2.0	U	2.0	U	2.0	U
SW8260	56-23-5	CARBON TETRACHLORIDE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	108-90-7	CHLOROBENZENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	75-00-3	CHLOROETHANE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	67-66-3	CHLOROFORM	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	74-87-3	CHLOROMETHANE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	156-59-2	CIS-1,2-DICHLOROETHENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	10061-01-5	CIS-1,3-DICHLOROPROPENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	110-82-7	CYCLOHEXANE	ug/l	N		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
SW8260	124-48-1	DIBROMOCHLOROMETHANE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	75-71-8	DICHLORODIFLUOROMETHANE	ug/l	N		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
SW8260	100-41-4	ETHYLBENZENE	ug/l	N		1.0	U	1.0	U	111		90.7		1.0	U	1.0	U	1.0	U
SW8260	98-82-8	ISOPROPYLBENZENE	ug/l	N		1.0	U	1.0	U	30.9		28.6		1.0	U	1.0	U	1.0	U
SW8260	79-20-9	METHYL ACETATE	ug/l	N		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
SW8260	1634-04-4	METHYL TERT-BUTYL ETHER	ug/l	N		1.0	U	1.0	U	0.31	J	0.31	J	1.0	U	1.0	U	1.0	U
SW8260	108-87-2	METHYLCYCLOHEXANE	ug/l	N		5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
SW8260	75-09-2	METHYLENE CHLORIDE	ug/l	N		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
SW8260	95-47-6	O-XYLENE	ug/l	N						6.9		3.9				1.0	U	1.0	U
SW8260	100-42-5	STYRENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	127-18-4	TETRACHLOROETHENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	108-88-3	TOLUENE	ug/l	N		1.0	U	1.0	U	3.4		1.6		1.0	U	1.0	U	1.0	U
SW8260	156-60-5	TRANS-1,2-DICHLOROETHENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	10061-02-6	TRANS-1,3-DICHLOROPROPENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	79-01-6	TRICHLOROETHENE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	75-69-4	TRICHLOROFLUOROMETHANE	ug/l	N		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
SW8260	75-01-4	VINYL CHLORIDE	ug/l	N		1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
SW8260	XYLENES1314	XYLENES, M & P	ug/l	N						5.4		3.6				1.0	U	1.0	U
SW8260	1330-20-7	XYLENES, TOTAL	ug/l	N		1.0	U	1.0	U	12.3		7.5		1.0	U	1.0	U	1.0	U

Table 2A
Water Chemical Characteristics - Detected Concentrations of Constituents

					Location ID	HATCH 1		HATCH 1		HATCH3		HATCH5		FIELDQC		HATCH3		HATCH5	
					Field Sample ID	WC011516-TAR WELL-WATER		WC031816TARWELLWATER		H3-W01-02122018		H5-W01-02122018		TB WC031816 TARWELL NAPL		Trip Blank 1		Trip Blank 2	
					Sampled	01/15/2016		03/18/2016		02/12/2018		02/12/2018		03/18/2016		02/12/2018		02/12/2018	
					SDG	JC12751		JC16572		JC60658		JC60659		JC16572		JC60658		JC60659	
					Matrix	WATER		WATER		WATER		WATER		WATER		WATER		WATER	
					Purpose	REG		REG		REG		REG		TB		TB		TB	
					Type	WC		WC		WC		WC		BLKWATER		BLKWATER		BLKWATER	
Method	**Parameter Code**	**Parameter Name**	**Units**	**Leached**															
SW8270	92-52-4	1,1'-BIPHENYL	ug/l	N		1.1	U	1.1	U	0.55	J	1.0	U						
SW8270	95-94-3	1,2,4,5-TETRACHLOROBENZENE	ug/l	N						2.0	U	2.0	U						
SW8270	123-91-1	1,4-DIOXANE	ug/l	N						1.0	U	1.0	U						
SW8270	108-60-1	2,2'-OXYBIS(1-CHLOROPROPANE)	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	58-90-2	2,3,4,6-TETRACHLOROPHENOL	ug/l	N						5.0	U	5.0	U						
SW8270	95-95-4	2,4,5-TRICHLOROPHENOL	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	88-06-2	2,4,6-TRICHLOROPHENOL	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	120-83-2	2,4-DICHLOROPHENOL	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	105-67-9	2,4-DIMETHYLPHENOL	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	51-28-5	2,4-DINITROPHENOL	ug/l	N		11	UJ	11	U	5.0	U	5.0	U						
SW8270	121-14-2	2,4-DINITROTOLUENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	606-20-2	2,6-DINITROTOLUENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	91-58-7	2-CHLORONAPHTHALENE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	95-57-8	2-CHLOROPHENOL	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	91-57-6	2-METHYLNAPHTHALENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	95-48-7	2-METHYLPHENOL	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	88-74-4	2-NITROANILINE	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	88-75-5	2-NITROPHENOL	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	34METPH	3&4-METHYLPHENOL	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	91-94-1	3,3'-DICHLOROBENZIDINE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	99-09-2	3-NITROANILINE	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	534-52-1	4,6-DINITRO-2-METHYLPHENOL	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	101-55-3	4-BROMOPHENYL PHENYL ETHER	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	59-50-7	4-CHLORO-3-METHYLPHENOL	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	106-47-8	4-CHLOROANILINE	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	7005-72-3	4-CHLOROPHENYL PHENYL ETHER	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	100-01-6	4-NITROANILINE	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	100-02-7	4-NITROPHENOL	ug/l	N		11	U	11	U	10	U	10	U						
SW8270	83-32-9	ACENAPHTHENE	ug/l	N		1.1	U	1.1	U	66.8		64.2							
SW8270	208-96-8	ACENAPHTHYLENE	ug/l	N		1.1	U	1.1	U	37.4		34.6							
SW8270	98-86-2	ACETOPHENONE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	120-12-7	ANTHRACENE	ug/l	N		1.1	U	1.1	U	6.4		5.2							
SW8270	1912-24-9	ATRAZINE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	100-52-7	BENZALDEHYDE	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	56-55-3	BENZO(A)ANTHRACENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	50-32-8	BENZO(A)PYRENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	205-99-2	BENZO(B)FLUORANTHENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	191-24-2	BENZO(G,H,I)PERYLENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	207-08-9	BENZO(K)FLUORANTHENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	111-91-1	BIS(2-CHLOROETHOXY)METHANE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	111-44-4	BIS(2-CHLOROETHYL)ETHER	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	ug/l	N		2.5		2.1	U	2.0	U	2.0	U						
SW8270	85-68-7	BUTYLBENZYL PHTHALATE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	105-60-2	CAPROLACTAM	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	86-74-8	CARBAZOLE	ug/l	N		1.1	U	1.1	U	45.6		40.4							
SW8270	218-01-9	CHRYSENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	84-74-2	DI-N-BUTYL PHTHALATE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	117-84-0	DI-N-OCTYL PHTHALATE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	53-70-3	DIBENZO(A,H)ANTHRACENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	132-64-9	DIBENZOFURAN	ug/l	N		5.6	U	5.3	U	5.7		5.4							
SW8270	84-66-2	DIETHYL PHTHALATE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	131-11-3	DIMETHYL PHTHALATE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	206-44-0	FLUORANTHENE	ug/l	N		1.1	U	1.1	U	3.8		2.8							
SW8270	86-73-7	FLUORENE	ug/l	N		1.1	U	1.1	U	10		3.8							
SW8270	118-74-1	HEXACHLOROBENZENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	87-68-3	HEXACHLOROBUTADIENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	77-47-4	HEXACHLOROCYCLOPENTADIENE	ug/l	N		11	U	11	U	10	U	10	U						
SW8270	67-72-1	HEXACHLOROETHANE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	193-39-5	INDENO(1,2,3-CD)PYRENE	ug/l	N		1.1	U	1.1	U	1.0	U	1.0	U						
SW8270	78-59-1	ISOPHORONE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	621-64-7	N-NITROSO-DI-N-PROPYLAMINE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	86-30-6	N-NITROSODIPHENYLAMINE	ug/l	N		5.6	U	5.3	U	5.0	U	5.0	U						
SW8270	91-20-3	NAPHTHALENE	ug/l	N		1.1	U	1.1	U	31.8		14.9							
SW8270	98-95-3	NITROBENZENE	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	87-86-5	PENTACHLOROPHENOL	ug/l	N		5.6	U	5.3	U	4.0	U	4.0	U						
SW8270	85-01-8	PHENANTHRENE	ug/l	N		1.1	U	1.1	U	41.1		33.0							
SW8270	108-95-2	PHENOL	ug/l	N		2.2	U	2.1	U	2.0	U	2.0	U						
SW8270	129-00-0	PYRENE	ug/l	N		1.1	U	1.1	U	2.8		2.0							

Table 2B
Water Chemical Characteristics - TCLP Results

					Location ID	HATCH 1		HATCH 1		HATCH 3		HATCH 5	
					Field Sample ID	WC011516-TAR WELL-WATER		WC031816-TAR WELL-WATER		H3-W01-02122018		H5-W01-02122018	
					Sampled	01/15/2016		03/18/2016		02/12/2018		02/12/2018	
					SDG	JC12751		JC16572		JC60658		JC60659	
					Matrix	WATER		WATER		WATER		WATER	
					Purpose	REG		REG		REG		REG	
					Type	WC		WC		WC		WC	
Method	**Parameter Code**	**Parameter Name**	**Units**	**Leached**									
SW6010	7440-38-2	ARSENIC	mg/L	Y		0.0099	U	0.011	U	0.014	U	0.014	U
SW6010	7440-39-3	BARIUM	mg/L	Y		0.0040	U	0.0020	U	0.27	J	0.26	J
SW6010	7440-43-9	CADMIUM	mg/L	Y		0.0014	U	0.0020	U	0.0035	U	0.0035	U
SW6010	7440-47-3	CHROMIUM	mg/L	Y		0.0039	U	0.0040	U	0.0050	J	0.0045	J
SW6010	7440-50-8	COPPER	mg/L	Y		0.0093	U						
SW6010	7439-92-1	LEAD	mg/L	Y		0.012	U	0.012	U	0.013	U	0.013	U
SW6010	7440-02-0	NICKEL	mg/L	Y		0.0040	U						
SW6010	7782-49-2	SELENIUM	mg/L	Y		0.016	U	0.021	U	0.033	U	0.033	U
SW6010	7440-22-4	SILVER	mg/L	Y		0.0066	U	0.0045	U	0.016	U	0.016	U
SW6010	7440-66-6	ZINC	mg/L	Y		0.024	U						
SW7470	7439-97-6	MERCURY	mg/L	Y		0.000069	U	0.000047	U	0.000083	U	0.000083	U
SW8081	12789-03-6	CONSTITUENTS OF CHLORDANE (ALPHA, BETA, AND GAMMA)	mg/L	Y		0.0050	U	0.0050	U	0.0033	U	0.0033	U
SW8081	72-20-8	ENDRIN	mg/L	Y		0.00010	U	0.00010	U	0.000067	U	0.000067	U
SW8081	58-89-9	GAMMA-BHC (LINDANE)	mg/L	Y		0.00010	U	0.00010	U	0.000067	U	0.000067	U
SW8081	76-44-8	HEPTACHLOR	mg/L	Y		0.00010	U	0.00010	U	0.000067	U	0.000067	U
SW8081	1024-57-3	HEPTACHLOR EPOXIDE	mg/L	Y		0.00010	U	0.00010	U	0.000067	U	0.000067	U
SW8081	72-43-5	METHOXYCHLOR	mg/L	Y		0.00020	U	0.00020	U	0.00013	U	0.00013	U
SW8081	8001-35-2	TOXAPHENE	mg/L	Y		0.0025	U	0.0025	U	0.0017	U	0.0017	U
SW8151	93-72-1	2,4,5-TP (SILVEX)	mg/L	Y		0.0015	U	0.0015	U	0.0012	U	0.0012	U
SW8151	94-75-7	2,4-D	mg/L	Y		0.0050	U	0.0050	U	0.0042	U	0.0042	U
SW8260	75-35-4	1,1-DICHLOROETHENE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	107-06-2	1,2-DICHLOROETHANE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	106-46-7	1,4-DICHLOROBENZENE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	78-93-3	2-BUTANONE	mg/L	Y		0.10	U	0.10	U	0.10	U	0.10	U
SW8260	71-43-2	BENZENE	mg/L	Y		0.0025	U	0.0025	U	0.0085		0.0025	
SW8260	56-23-5	CARBON TETRACHLORIDE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	108-90-7	CHLOROBENZENE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	67-66-3	CHLOROFORM	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	127-18-4	TETRACHLOROETHENE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	79-01-6	TRICHLOROETHENE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	75-01-4	VINYL CHLORIDE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8270	106-46-7	1,4-DICHLOROBENZENE	mg/L	Y		0.020	U	0.020	U	0.020	U	0.020	U
SW8270	95-95-4	2,4,5-TRICHLOROPHENOL	mg/L	Y		0.050	U	0.050	U	0.050	U	0.050	U
SW8270	88-06-2	2,4,6-TRICHLOROPHENOL	mg/L	Y		0.050	U	0.050	U	0.050	U	0.050	U
SW8270	121-14-2	2,4-DINITROTOLUENE	mg/L	Y		0.020	U	0.020	U	0.020	U	0.020	U
SW8270	95-48-7	2-METHYLPHENOL	mg/L	Y		0.020	U	0.020	U	0.020	U	0.020	U
SW8270	34METPH	3&4-METHYLPHENOL	mg/L	Y		0.020	U	0.020	U	0.020	U	0.020	U
SW8270	118-74-1	HEXACHLOROBENZENE	mg/L	Y		0.020	U	0.020	U	0.020	U	0.020	U
SW8270	87-68-3	HEXACHLOROBUTADIENE	mg/L	Y		0.010	U	0.010	U	0.010	U	0.010	U
SW8270	67-72-1	HEXACHLOROETHANE	mg/L	Y		0.050	U	0.050	U	0.050	U	0.050	U
SW8270	98-95-3	NITROBENZENE	mg/L	Y		0.020	U	0.020	U	0.020	U	0.020	U
SW8270	87-86-5	PENTACHLOROPHENOL	mg/L	Y		0.10	U	0.10	U	0.10	U	0.10	U
SW8270	110-86-1	PYRIDINE	mg/L	Y		0.020	U	0.020	U	0.020	U	0.020	U

PARSONS

					Location ID	HATCH 1		HATCH 1		HATCH 1		HATCH2		HATCH3		HATCH4		HATCH5		HATCH6	
					Field Sample ID	WC031816TARWELLNAPL		WC031816TARWELLNAPL		WC031816TARWELLNAPL		H2-T01-02152018		H3-T01-021518		H4-T01-021418		H5-T01-02132018		H6-T01-02132018	
					Sampled	03/18/2016		03/18/2016		03/18/2016		02/15/2018		02/15/2018		02/14/2018		02/13/2018		02/13/2018	
					SDG	JC16572		JC16572R		JC16572T		JC60928		JC60928		JC60928		JC60789		JC60789	
					Matrix	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
					Purpose	REG		REG		REG		REG		REG		REG		REG		REG	
					Type	Oil		Oil		Oil		WC		WC		WC		WC		WC	
Method	**Parameter Code**	**Parameter Name**	**Units**	**Leached**																	
SW9045	PH	pH	SU	N										7.27		7.78		7.53			
SW9040	CORROS	CORROSIVITY	SU	N		8.02	J							7.27		7.78		7.53			
ASTM D1498	ORP	OXIDATION-REDUCTION POTENTIAL	mV	N										264		234		209			
846-7.3.3.2	REAC-CN	REACTIVE CYANIDE	mg/kg	N		10	U							9.9	U	9.9	U	10	U		
846-7.3.4.2	REAC-S	REACTIVE SULFIDE	mg/kg	N		100	U							99	U	99	U	75.3	J		
SW1010	IGNITLIQPM	Ignitability (liquids) Pensky-Martens	deg F	N		184								200		200		200			
ASTM D240-92	BTU	BTU	BTU/lb	N				13900				12700		12400		12700		12700		11400	
SM2540G	MOIST	MOISTURE, PERCENT	%	N				34.6													
SW9020	TOX	TOTAL ORGANIC HALIDES (TOX)	mg/kg	N						20	U			100	U	120	U	98	U		
SW6010	7429-90-5	ALUMINUM	mg/kg	N										85.5		102		179			
SW6010	7440-36-0	ANTIMONY	mg/kg	N										0.85	J	1.2	J	1.2	J		
SW6010	7440-38-2	ARSENIC	mg/kg	N		8.7								10.5		13.2		6.5			
SW6010	7440-39-3	BARIUM	mg/kg	N		0.079	U							5.8	J	4.2	J	7.3	J		
SW6010	7440-41-7	BERYLLIUM	mg/kg	N		0.022	U							0.050	J	0.050	J	0.051	U		
SW6010	7440-43-9	CADMIUM	mg/kg	N		0.98								0.85		1.2		1.6			
SW6010	7440-70-2	CALCIUM	mg/kg	N										845		1390		1130			
SW6010	7440-47-3	CHROMIUM	mg/kg	N		1.0								0.92	J	0.68	J	14.6			
SW6010	7440-48-4	COBALT	mg/kg	N										1.1	J	4.5	J	1.5	J		
SW6010	7440-50-8	COPPER	mg/kg	N		8.8								8.6		9.6		26.9			
SW6010	7439-89-6	IRON	mg/kg	N										1810		792		8130	J		
SW6010	7439-92-1	LEAD	mg/kg	N		77.6								74.2		108		120	J-		
SW6010	7439-95-4	MAGNESIUM	mg/kg	N										80.1	J	98.1	J	275	J		
SW6010	7439-96-5	MANGANESE	mg/kg	N										11.6		10.4		43.3			
SW6010	7440-02-0	NICKEL	mg/kg	N		18.7								15.5		58.5		23.8			
SW6010	7440-09-7	POTASSIUM	mg/kg	N										30	U	35.4	J	83.7	J		
SW6010	7782-49-2	SELENIUM	mg/kg	N		0.45	U							1.3	J	2.3		0.77	J		
SW6010	7440-22-4	SILVER	mg/kg	N		0.097	U							0.29	U	0.29	U	0.30	U		
SW6010	7440-23-5	SODIUM	mg/kg	N										351	J	640	J	1360	J+		
SW6010	7704-34-9	SULFUR	mg/kg	N								847		1620		2020		3530		2390	
SW6010	7440-28-0	THALLIUM	mg/kg	N										3.0		3.2		2.0			
SW6010	7440-62-2	VANADIUM	mg/kg	N		0.081	U							1.4	J	5.0		2.9	J		
SW6010	7440-66-6	ZINC	mg/kg	N		78.4								57.6		108		67.5			
SW7196	18540-29-9	HEXAVALENT CHROMIUM	mg/kg	N		0.40	U														
SW7471	7439-97-6	MERCURY	mg/kg	N		0.70								2.6		1.9		0.54			
SW8081	12789-03-6	CONSTITUENTS OF CHLORDANE (ALPHA, BETA, AND GAMMA)	ug/kg	N		380	U														
SW8081	72-20-8	ENDRIN	ug/kg	N		7.7	U														
SW8081	58-89-9	GAMMA-BHC (LINDANE)	ug/kg	N		7.7	U														
SW8081	76-44-8	HEPTACHLOR	ug/kg	N		7.7	U														
SW8081	1024-57-3	HEPTACHLOR EPOXIDE	ug/kg	N		7.7	U														
SW8081	72-43-5	METHOXYCHLOR	ug/kg	N		15	U														
SW8081	8001-35-2	TOXAPHENE	ug/kg	N		190	U														
SW8082	12674-11-2	AROCLOR-1016	ug/kg	N		380	U							450	U	450	U	500	U		
SW8082	11104-28-2	AROCLOR-1221	ug/kg	N		380	U							450	U	450	U	500	U		
SW8082	11141-16-5	AROCLOR-1232	ug/kg	N		380	U							450	U	450	U	500	U		
SW8082	53469-21-9	AROCLOR-1242	ug/kg	N		380	U							450	U	450	U	500	U		
SW8082	12672-29-6	AROCLOR-1248	ug/kg	N		380	U							450	U	450	U	500	U		
SW8082	11097-69-1	AROCLOR-1254	ug/kg	N		380	U							450	U	450	U	500	U		
SW8082	11096-82-5	AROCLOR-1260	ug/kg	N		380	U							450	U	450	U	500	U		
SW8082	37324-23-5	AROCLOR-1262	ug/kg	N		380	U							450	U	450	U	500	U		
SW8082	11100-14-4	AROCLOR-1268	ug/kg	N		380	U							450	U	450	U	500	U		
SW8260	71-55-6	1,1,1-TRICHLOROETHANE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	79-34-5	1,1,2,2-TETRACHLOROETHANE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/kg	N		23000	U							24000	U	12000	U	260	U		
SW8260	79-00-5	1,1,2-TRICHLOROETHANE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	75-34-3	1,1-DICHLOROETHANE	ug/kg	N		4500	U							4800	U	2400	U	51	U		

					Location ID	HATCH 1		HATCH 1		HATCH 1		HATCH2		HATCH3		HATCH4		HATCH5		HATCH6	
					Field Sample ID	WC031816TARWELLNAPL		WC031816TARWELLNAPL		WC031816TARWELLNAPL		H2-T01-02152018		H3-T01-021518		H4-T01-021418		H5-T01-02132018		H6-T01-02132018	
					Sampled	03/18/2016		03/18/2016		03/18/2016		02/15/2018		02/15/2018		02/14/2018		02/13/2018		02/13/2018	
					SDG	JC16572		JC16572R		JC16572T		JC60928		JC60928		JC60928		JC60789		JC60789	
					Matrix	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
					Purpose	REG		REG		REG		REG		REG		REG		REG		REG	
					Type	Oil		Oil		Oil		WC		WC		WC		WC		WC	
Method	**Parameter Code**	**Parameter Name**	**Units**	**Leached**																	
SW8260	75-35-4	1,1-DICHLOROETHENE	ug/kg	N		4500	U							4800	U	2400	U	51	U		
SW8260	87-61-6	1,2,3-TRICHLOROBENZENE	ug/kg	N										24000	U	12000	U	260	U		
SW8260	120-82-1	1,2,4-TRICHLOROBENZENE	ug/kg	N		23000	U							24000	U	12000	U	260	U		
SW8260	96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	106-93-4	1,2-DIBROMOETHANE	ug/kg	N		4500	U							4800	U	2400	U	51	U		
SW8260	95-50-1	1,2-DICHLOROBENZENE	ug/kg	N		4500	U							4800	U	2400	U	51	U		
SW8260	107-06-2	1,2-DICHLOROETHANE	ug/kg	N		4500	U							4800	U	2400	U	51	U		
SW8260	78-87-5	1,2-DICHLOROPROPANE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	541-73-1	1,3-DICHLOROBENZENE	ug/kg	N		4500	U							4800	U	2400	U	51	U		
SW8260	106-46-7	1,4-DICHLOROBENZENE	ug/kg	N		4500	U							4800	U	2400	U	51	U		
SW8260	78-93-3	2-BUTANONE	ug/kg	N		45000	U							48000	U	24000	U	510	U		
SW8260	110-75-8	2-CHLOROETHYL VINYL ETHER	ug/kg	N		110000	U							120000	U	61000	U				
SW8260	591-78-6	2-HEXANONE	ug/kg	N		23000	U							24000	U	12000	U	260	U		
SW8260	108-10-1	4-METHYL-2-PENTANONE	ug/kg	N		23000	U							24000	U	12000	U	260	U		
SW8260	67-64-1	ACETONE	ug/kg	N		45000	U							48000	U	24000	U	510	U		
SW8260	107-02-8	ACROLEIN	ug/kg	N		230000	U							48000	U	24000	U				
SW8260	107-13-1	ACRYLONITRILE	ug/kg	N		230000	U							48000	U	24000	U				
SW8260	71-43-2	BENZENE	ug/kg	N		257000								145000		81700		81500			
SW8260	74-97-5	BROMOCHLOROMETHANE	ug/kg	N										24000	U	12000	U	260	U		
SW8260	75-27-4	BROMODICHLOROMETHANE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	75-25-2	BROMOFORM	ug/kg	N		23000	U							24000	U	12000	U	260	U		
SW8260	74-83-9	BROMOMETHANE	ug/kg	N		23000	U							24000	U	12000	U	260	U		
SW8260	75-15-0	CARBON DISULFIDE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	56-23-5	CARBON TETRACHLORIDE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	108-90-7	CHLOROBENZENE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	75-00-3	CHLOROETHANE	ug/kg	N		23000	U							24000	U	12000	U	260	U		
SW8260	67-66-3	CHLOROFORM	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	74-87-3	CHLOROMETHANE	ug/kg	N		23000	U							24000	U	12000	U	260	U		
SW8260	156-59-2	CIS-1,2-DICHLOROETHENE	ug/kg	N		4500	U							4800	U	2400	U	51	U		
SW8260	10061-01-5	CIS-1,3-DICHLOROPROPENE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	110-82-7	CYCLOHEXANE	ug/kg	N		9100	U							9500	U	4900	U	28.4	J		
SW8260	124-48-1	DIBROMOCHLOROMETHANE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	75-71-8	DICHLORODIFLUOROMETHANE	ug/kg	N		23000	U							24000	U	12000	U	260	U		
SW8260	100-41-4	ETHYLBENZENE	ug/kg	N		45800								30700		16600		9830			
SW8260	98-82-8	ISOPROPYLBENZENE	ug/kg	N		1470	J							9500	U	4900	U	365			
SW8260	79-20-9	METHYL ACETATE	ug/kg	N		23000	U							24000	U	12000	U	260	U		
SW8260	1634-04-4	METHYL TERT-BUTYL ETHER	ug/kg	N		4500	U							4800	U	2400	U	51	U		
SW8260	108-87-2	METHYLCYCLOHEXANE	ug/kg	N		9100	U							9500	U	4900	U	114			
SW8260	75-09-2	METHYLENE CHLORIDE	ug/kg	N		23000	U							24000	U	12000	U	260	U		
SW8260	95-47-6	O-XYLENE	ug/kg	N										46500		23000		24000			
SW8260	100-42-5	STYRENE	ug/kg	N		141000								99700		49600		46000			
SW8260	TIC	TENTATIVELY IDENTIFIED COMPOUND	ug/kg	N										81000	NJ	36000	NJ				
SW8260	127-18-4	TETRACHLOROETHENE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	108-88-3	TOLUENE	ug/kg	N		291000								193000		97400		90100			
SW8260	156-60-5	TRANS-1,2-DICHLOROETHENE	ug/kg	N		4500	U							4800	U	2400	U	51	U		
SW8260	10061-02-6	TRANS-1,3-DICHLOROPROPENE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	79-01-6	TRICHLOROETHENE	ug/kg	N		4500	U							4800	U	2400	U	51	U		
SW8260	75-69-4	TRICHLOROFLUOROMETHANE	ug/kg	N		23000	U							24000	U	12000	U	260	U		
SW8260	75-01-4	VINYL CHLORIDE	ug/kg	N		9100	U							9500	U	4900	U	100	U		
SW8260	XYLENES1314	XYLENES, M & P	ug/kg	N										121000		60400		56200			
SW8260	1330-20-7	XYLENES, TOTAL	ug/kg	N		227000								168000		83400		80200			
SW8270	92-52-4	1,1'-BIPHENYL	ug/kg	N		2760000								1380000		1780000		810000			
SW8270	95-94-3	1,2,4,5-TETRACHLOROBENZENE	ug/kg	N										31000	U	83000	U	25000	U		
SW8270	95-50-1	1,2-DICHLOROBENZENE	ug/kg	N										13000	U	33000	U				
SW8270	122-66-7	1,2-DIPHENYLHYDRAZINE/AZOBENZENE	ug/kg	N										13000	U	33000	U				
SW8270	541-73-1	1,3-DICHLOROBENZENE	ug/kg	N										13000	U	33000	U				
SW8270	106-46-7	1,4-DICHLOROBENZENE	ug/kg	N										13000	U	33000	U				
SW8270	123-91-1	1,4-DIOXANE	ug/kg	N										6300	U	17000	U	5000	U		
SW8270	108-60-1	2,2'-OXYBIS(1-CHLOROPROPANE)	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	58-90-2	2,3,4,6-TETRACHLOROPHENOL	ug/kg	N										31000	U	83000	U	25000	U		

					Location ID	HATCH 1		HATCH 1		HATCH 1		HATCH2		HATCH3		HATCH4		HATCH5		HATCH6	
					Field Sample ID	WC031816TARWELLNAPL		WC031816TARWELLNAPL		WC031816TARWELLNAPL		H2-T01-02152018		H3-T01-021518		H4-T01-021418		H5-T01-02132018		H6-T01-02132018	
					Sampled	03/18/2016		03/18/2016		03/18/2016		02/15/2018		02/15/2018		02/14/2018		02/13/2018		02/13/2018	
					SDG	JC16572		JC16572R		JC16572T		JC60928		JC60928		JC60928		JC60789		JC60789	
					Matrix	SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID		SOLID	
					Purpose	REG		REG		REG		REG		REG		REG		REG		REG	
					Type	Oil		Oil		Oil		WC		WC		WC		WC		WC	
Method	**Parameter Code**	**Parameter Name**	**Units**	**Leached**																	
SW8270	95-95-4	2,4,5-TRICHLOROPHENOL	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	88-06-2	2,4,6-TRICHLOROPHENOL	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	120-83-2	2,4-DICHLOROPHENOL	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	105-67-9	2,4-DIMETHYLPHENOL	ug/kg	N		606000								556000		629000		273000			
SW8270	51-28-5	2,4-DINITROPHENOL	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	121-14-2	2,4-DINITROTOLUENE	ug/kg	N		20000	U							6300	U	17000	U	5000	U		
SW8270	606-20-2	2,6-DINITROTOLUENE	ug/kg	N		20000	U							6300	U	17000	U	5000	U		
SW8270	91-58-7	2-CHLORONAPHTHALENE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	95-57-8	2-CHLOROPHENOL	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	91-57-6	2-METHYLNAPHTHALENE	ug/kg	N		18600000								7970000		10400000		5020000			
SW8270	95-48-7	2-METHYLPHENOL	ug/kg	N		583000								387000		421000		276000			
SW8270	88-74-4	2-NITROANILINE	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	88-75-5	2-NITROPHENOL	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	34METPH	3&4-METHYLPHENOL	ug/kg	N		1350000								1120000		1180000		583000			
SW8270	91-94-1	3,3'-DICHLOROBENZIDINE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	99-09-2	3-NITROANILINE	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	534-52-1	4,6-DINITRO-2-METHYLPHENOL	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	101-55-3	4-BROMOPHENYL PHENYL ETHER	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	59-50-7	4-CHLORO-3-METHYLPHENOL	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	106-47-8	4-CHLOROANILINE	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	7005-72-3	4-CHLOROPHENYL PHENYL ETHER	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	100-01-6	4-NITROANILINE	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	100-02-7	4-NITROPHENOL	ug/kg	N		200000	U							63000	U	170000	U	50000	U		
SW8270	83-32-9	ACENAPHTHENE	ug/kg	N		1860000								1050000		1350000		535000			
SW8270	208-96-8	ACENAPHTHYLENE	ug/kg	N		13500000								4970000		6390000		3950000			
SW8270	98-86-2	ACETOPHENONE	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	120-12-7	ANTHRACENE	ug/kg	N		7390000								3610000		4680000		2700000			
SW8270	1912-24-9	ATRAZINE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	100-52-7	BENZALDEHYDE	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	92-87-5	BENZIDINE	ug/kg	N										63000	U	170000	U				
SW8270	56-55-3	BENZO(A)ANTHRACENE	ug/kg	N		6740000								2870000		3840000		1940000			
SW8270	50-32-8	BENZO(A)PYRENE	ug/kg	N		6090000								2550000		3320000		1600000			
SW8270	205-99-2	BENZO(B)FLUORANTHENE	ug/kg	N		6620000								2650000		3370000		1660000			
SW8270	191-24-2	BENZO(G,H,I)PERYLENE	ug/kg	N		2700000								1340000		1770000		870000			
SW8270	207-08-9	BENZO(K)FLUORANTHENE	ug/kg	N		2580000								940000		935000		552000			
SW8270	100-51-6	BENZYL ALCOHOL	ug/kg	N										13000	U	33000	U				
SW8270	111-91-1	BIS(2-CHLOROETHOXY)METHANE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	111-44-4	BIS(2-CHLOROETHYL)ETHER	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	85-68-7	BUTYLBENZYL PHTHALATE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	105-60-2	CAPROLACTAM	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	86-74-8	CARBAZOLE	ug/kg	N		3420000								1240000		1570000		962000			
SW8270	218-01-9	CHRYSENE	ug/kg	N		5710000								2840000		3510000		1710000			
SW8270	84-74-2	DI-N-BUTYL PHTHALATE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	117-84-0	DI-N-OCTYL PHTHALATE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	53-70-3	DIBENZO(A,H)ANTHRACENE	ug/kg	N		1060000								457000		508000		367000			
SW8270	132-64-9	DIBENZOFURAN	ug/kg	N		5630000								2610000		3220000		1540000			
SW8270	84-66-2	DIETHYL PHTHALATE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	131-11-3	DIMETHYL PHTHALATE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	206-44-0	FLUORANTHENE	ug/kg	N		17000000								6330000		8000000		4120000			
SW8270	86-73-7	FLUORENE	ug/kg	N		10300000								4720000		6130000		3120000			
SW8270	118-74-1	HEXACHLOROBENZENE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	87-68-3	HEXACHLOROBUTADIENE	ug/kg	N		20000	U							6300	U	17000	U	5000	U		
SW8270	77-47-4	HEXACHLOROCYCLOPENTADIENE	ug/kg	N		200000	U							63000	U	170000	U	50000	U		
SW8270	67-72-1	HEXACHLOROETHANE	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	193-39-5	INDENO(1,2,3-CD)PYRENE	ug/kg	N		3240000								1430000		1860000		746000			
SW8270	78-59-1	ISOPHORONE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	621-64-7	N-NITROSO-DI-N-PROPYLAMINE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	62-75-9	N-NITROSODIMETHYLAMINE	ug/kg	N										13000	U	33000	U				
SW8270	86-30-6	N-NITROSODIPHENYLAMINE	ug/kg	N		100000	U							31000	U	83000	U	25000	U		
SW8270	91-20-3	NAPHTHALENE	ug/kg	N		45900000								28400000		38900000		20900000			
SW8270	98-95-3	NITROBENZENE	ug/kg	N		40000	U							13000	U	33000	U	10000	U		
SW8270	87-86-5	PENTACHLOROPHENOL	ug/kg	N		100000	U							25000	U	67000	U	20000	U		
SW8270	85-01-8	PHENANTHRENE	ug/kg	N		18200000								12000000		15500000		8220000			
SW8270	108-95-2	PHENOL	ug/kg	N		1430000								920000		1010000		497000			
SW8270	129-00-0	PYRENE	ug/kg	N		14500000								6320000		8100000		4780000			
SW8270	TIC	TENTATIVELY IDENTIFIED COMPOUND	ug/kg	N										89000	NJ	220000	NJ				

Table 3B
Tar Chemical Characteristics -TCLP Results

					Location ID	WC		HATCH3		HATCH4		HATCH5	
					Field Sample ID	WC031816TARWELLNAPL		H3-T01-021518		H4-T01-021418		H5-T01-02132018	
					Sampled	03/18/2016		02/15/2018		02/14/2018		02/13/2018	
					SDG	JC16572		JC60928		JC60928		JC60789	
					Matrix	SOLID		SOLID		SOLID		SOLID	
					Purpose	REG		REG		REG		REG	
					Type	Oil		WC		WC		WC	
Method	**Parameter Code**	**Parameter Name**	**Units**	**Leached**									
SW6010	7440-38-2	ARSENIC	mg/L	Y		0.011	U	0.020	J	0.023	J	0.027	U
SW6010	7440-39-3	BARIUM	mg/L	Y		0.0020	U	0.025	J	0.042	J	0.037	J
SW6010	7440-43-9	CADMIUM	mg/L	Y		0.0020	U	0.0035	U	0.0035	U	0.0070	U
SW6010	7440-47-3	CHROMIUM	mg/L	Y		0.0040	U	0.0043	U	0.0043	U	0.0085	U
SW6010	7439-92-1	LEAD	mg/L	Y		0.012	U	0.015	J	0.026	J	0.042	J
SW6010	7782-49-2	SELENIUM	mg/L	Y		0.021	U	0.033	U	0.033	U	0.066	U
SW6010	7440-22-4	SILVER	mg/L	Y		0.0045	U	0.016	U	0.016	U	0.031	U
SW7470	7439-97-6	MERCURY	mg/L	Y		0.000047	U	0.000083	U	0.000083	U	0.00040	U
SW8081	12789-03-6	CONSTITUENTS OF CHLORDANE (ALPHA, BETA, AND GAMMA)	mg/L	Y		0.0050	U	0.0033	U	0.0033	U	0.0033	U
SW8081	72-20-8	ENDRIN	mg/L	Y		0.00010	U	0.000067	U	0.000067	U	0.000067	U
SW8081	58-89-9	GAMMA-BHC (LINDANE)	mg/L	Y		0.00010	U	0.000067	U	0.000067	U	0.000067	U
SW8081	76-44-8	HEPTACHLOR	mg/L	Y		0.00025		0.000067	U	0.000067	U	0.00062	
SW8081	1024-57-3	HEPTACHLOR EPOXIDE	mg/L	Y		0.00010	U	0.000067	U	0.000067	U	0.000067	U
SW8081	72-43-5	METHOXYCHLOR	mg/L	Y		0.00020	U	0.00013	U	0.00013	U	0.00013	U
SW8081	8001-35-2	TOXAPHENE	mg/L	Y		0.0025	U	0.0017	U	0.0017	U	0.0017	U
SW8151	93-72-1	2,4,5-TP (SILVEX)	mg/L	Y		0.0015	U	0.0012	U	0.0012	U	0.0012	U
SW8151	94-75-7	2,4-D	mg/L	Y		0.0050	U	0.0042	U	0.0042	U	0.0042	U
SW8260	75-35-4	1,1-DICHLOROETHENE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	107-06-2	1,2-DICHLOROETHANE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	106-46-7	1,4-DICHLOROBENZENE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	78-93-3	2-BUTANONE	mg/L	Y		0.10	U	0.10	U	0.10	U	0.10	U
SW8260	71-43-2	BENZENE	mg/L	Y		17.0	J	10.9		8.90		10.5	
SW8260	56-23-5	CARBON TETRACHLORIDE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	108-90-7	CHLOROBENZENE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	67-66-3	CHLOROFORM	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	127-18-4	TETRACHLOROETHENE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	79-01-6	TRICHLOROETHENE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8260	75-01-4	VINYL CHLORIDE	mg/L	Y		0.0050	U	0.0050	U	0.0050	U	0.0050	U
SW8270	106-46-7	1,4-DICHLOROBENZENE	mg/L	Y		0.020	U	0.020	U	0.020	U	0.040	U
SW8270	95-95-4	2,4,5-TRICHLOROPHENOL	mg/L	Y		0.050	U	0.050	U	0.050	U	0.10	U
SW8270	88-06-2	2,4,6-TRICHLOROPHENOL	mg/L	Y		0.050	U	0.050	U	0.050	U	0.10	U
SW8270	121-14-2	2,4-DINITROTOLUENE	mg/L	Y		0.020	U	0.020	U	0.020	U	0.040	U
SW8270	95-48-7	2-METHYLPHENOL	mg/L	Y		11.0		8.86		4.07		14.2	
SW8270	34METPH	3&4-METHYLPHENOL	mg/L	Y		28.0		21.4		9.32		34.3	
SW8270	118-74-1	HEXACHLOROBENZENE	mg/L	Y		0.020	U	0.020	U	0.020	U	0.040	U
SW8270	87-68-3	HEXACHLOROBUTADIENE	mg/L	Y		0.010	U	0.010	U	0.010	U	0.020	U
SW8270	67-72-1	HEXACHLOROETHANE	mg/L	Y		0.050	U	0.050	U	0.050	U	0.10	U
SW8270	98-95-3	NITROBENZENE	mg/L	Y		0.020	U	0.020	U	0.020	U	0.040	U
SW8270	87-86-5	PENTACHLOROPHENOL	mg/L	Y		0.10	U	0.10	U	0.10	U	0.20	U
SW8270	110-86-1	PYRIDINE	mg/L	Y		0.811		0.685		0.312		1.16	

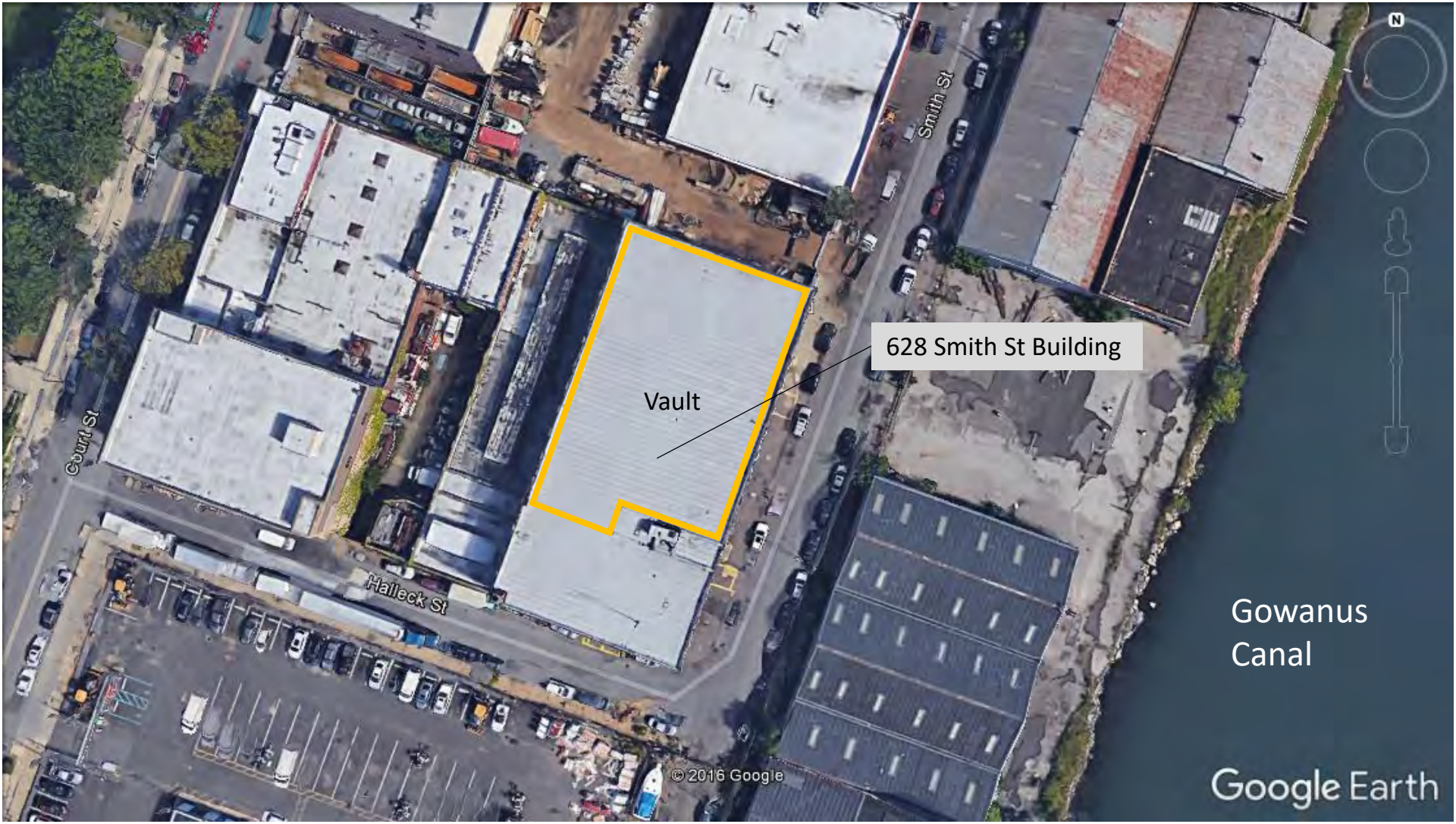
Table 4A
Tar Physical Properties

Hatch	Sample ID	Matrix	Temperature, ˚F	Specific Gravity	Density, g/cc	Viscosity	
						Centistokes	Centipoise
Hatch 1	031816 Tar Well NAPL	NAPL	70	1.189	1.187	5,120	6,080
Hatch 1	031816 Tar Well NAPL	NAPL	100	1.186	1.177	867	1,020
Hatch 1	031816 Tar Well NAPL	NAPL	130	1.182	1.166	237	276
Hatch 2	H2-T01-02152018	NAPL	50	1.220	1.2196	15,000	18,294
Hatch 2	H2-T01-02152019	NAPL	70	1.216	1.2136	3,187	3,868
Hatch 2	H2-T01-02152020	NAPL	100	1.210	1.2012	664	798
Hatch 2	H2-T01-02152021	NAPL	130	1.208	1.1910	163	194
Hatch 3	H3-T01-02152018	NAPL	50	1.212	1.2118	30,500	36,960
Hatch 3	H3-T01-02152018	NAPL	70	1.208	1.2055	8,934	10,770
Hatch 3	H3-T01-02152018	NAPL	100	1.205	1.1969	1,577	1,887
Hatch 3	H3-T01-02152018	NAPL	130	1.204	1.1874	435	516
Hatch 4	H4-T01-02142018	NAPL	50	1.240	1.2392	60,500	74,972
Hatch 4	H4-T01-02142018	NAPL	70	1.237	1.2342	12,992	16,036
Hatch 4	H4-T01-02142018	NAPL	100	1.234	1.2259	2,374	2,910
Hatch 4	H4-T01-02142018	NAPL	130	1.234	1.2172	593	721
Hatch 5	H5-T01-02132018	NAPL	50	1.252	1.2515	80,000	100,120
Hatch 5	H5-T01-02132018	NAPL	70	1.247	1.2449	15,021	18,699
Hatch 5	H5-T01-02132018	NAPL	100	1.245	1.2359	1,866	2,306
Hatch 5	H5-T01-02132018	NAPL	130	1.244	1.2264	436	534
Hatch 6	H6-T01-02132018	NAPL	50	1.227	1.2263	30,000	36,789
Hatch 6	H6-T01-02132018	NAPL	70	1.225	1.2229	6,559	8,021
Hatch 6	H6-T01-02132018	NAPL	100	1.224	1.2158	1,388	1,687
Hatch 6	H6-T01-02132018	NAPL	130	1.225	1.2074	321	388

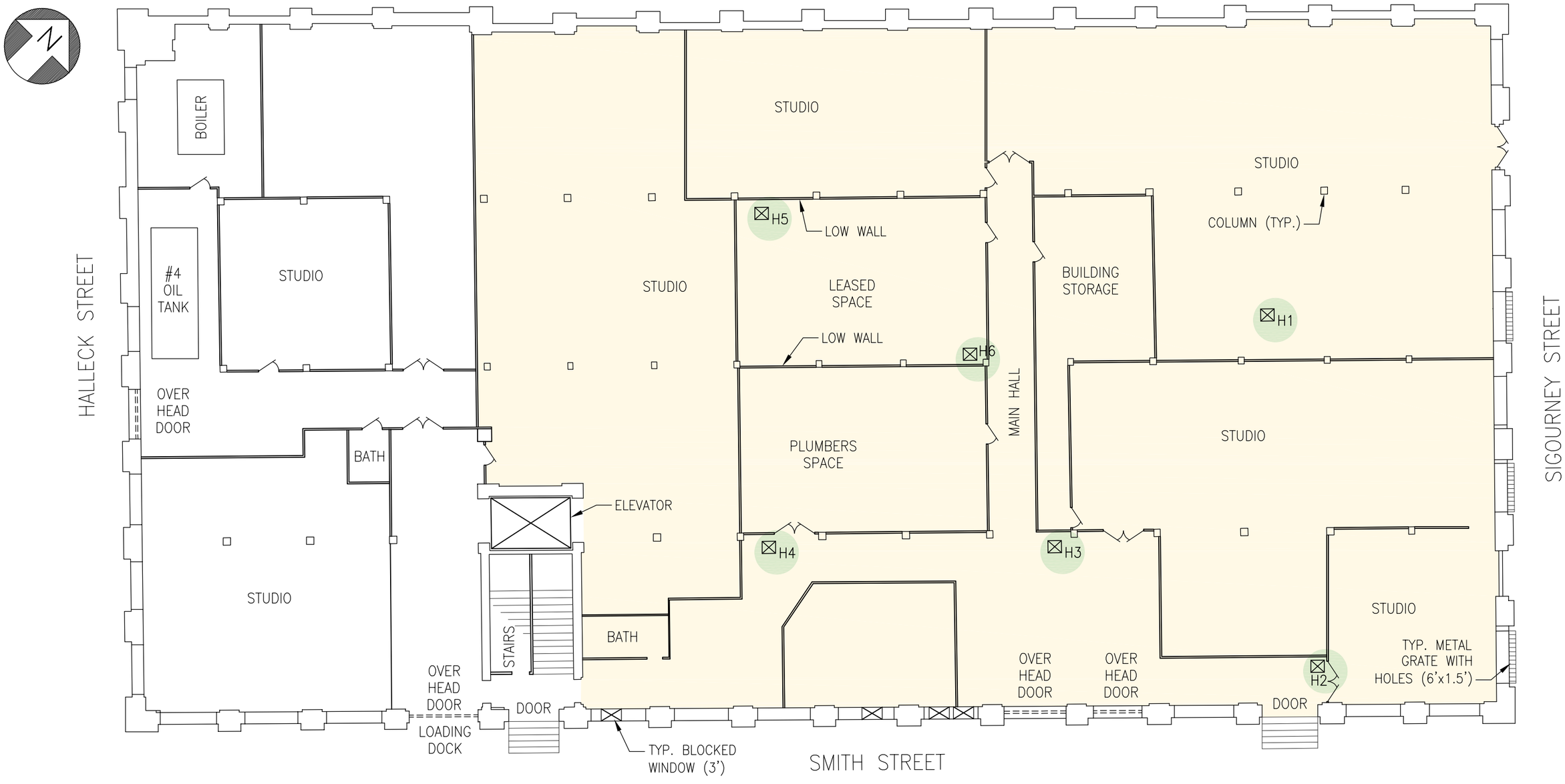
Table 4B
Tar Physical Properties

Hatch	Sample ID	Matrix	Moisture Content (%)	150˚C Mass Loss (%)	180˚C Mass Loss (%)
Hatch 1	031816 Tar Well NAPL	DNAPL	17.8	29.1	31.6
Hatch 2	H2-T01-02152018	DNAPL	14.2	24.8	26.6
Hatch 3	H3-T01-02152018	DNAPL	3.9	19.7	21.2
Hatch 4	H4-T01-02152018	DNAPL	4.4	19.8	21.8
Hatch 5	H5-T01-02152018	DNAPL	11.7	27.6	29.9
Hatch 6	H6-T01-02152018	DNAPL	21.1	36.4	38.1

Figure 1. Location of vault at 628 Smith Street building.



PARSONS



LEGEND:

- H2 — EXISTING HATCH
- TYPICAL BLOCKED WINDOW (3')
- TYPICAL METAL GRATE WITH HOLES (6'x1.5')
- APPROXIMATE EXTENT OF VAULT BELOW FIRST FLOOR

NOTE:

BUILDING LAYOUT AND INTERIOR COLUMNS WERE TAKEN FROM A 1946 ARCHITECTURAL "FIRST FLOOR PLAN" BY JUDSON E. SCHNALL & MAXFIELD BLAUFEAX ARCHITECTS. MEASUREMENTS OF INTERIOR WALLS AND OTHER FEATURES MADE USING ENGINEERS TAPE ON APRIL 19, 2017.

NO.	DESCRIPTION	DATE	DRAWN	CHK'D	APPV'D
B	REVISED	02/20/18	RR	PFM	–
A	ISSUED FOR COMMENT	05/03/17	RR	PFM	–

PARSONS ENVIRONMENT & INFRASTRUCTURE
100 HIGH ST, 4TH FL
BOSTON, MA 02110
(617) 946-9400

DRAWING TITLE
Honeywell
1ST FLOOR PLAN FOR
628 SMITH STREET BUILDING

DRAWN BY	CHECKED BY
RR	PFM
DATE	APPROVED BY
05-03-17	PFM

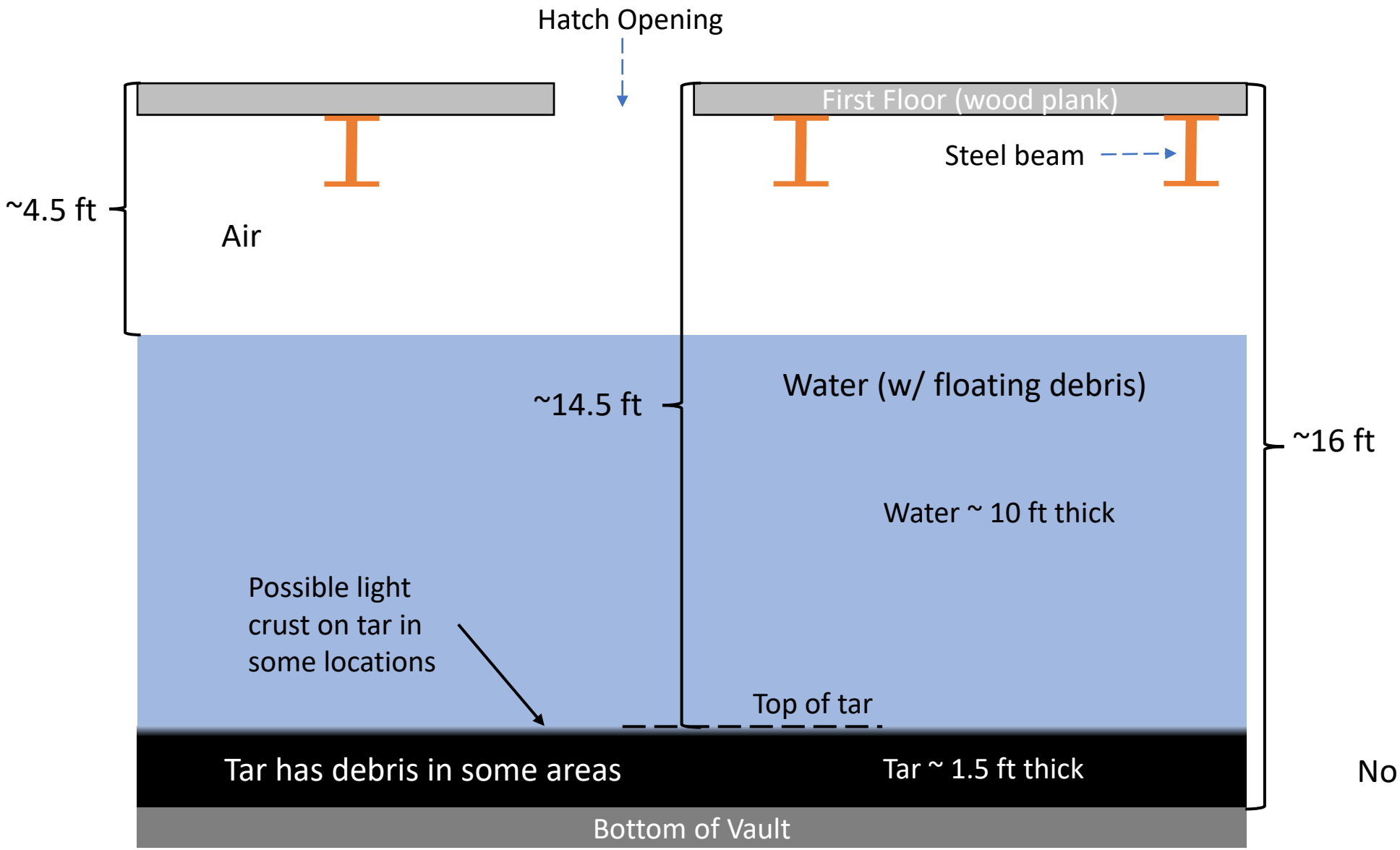
DRAWING NO.
FIGURE 2

SCALE
1" = 15'

JOB
450881-01102

FILE NAME: P:\PIT\PROJECTS\HONEYWELL\SMITH STREET – BROOKLYN NY\CAD\AUTOCAD\TAR WELL IRM\FIGURE 2.DWG
PLOT DATE: 7/24/2018 7:52 AM PLOTTED BY: RABUFFETTI, RICH

Figure 3. Cross Section of Tar Vault and Typical Hatch.

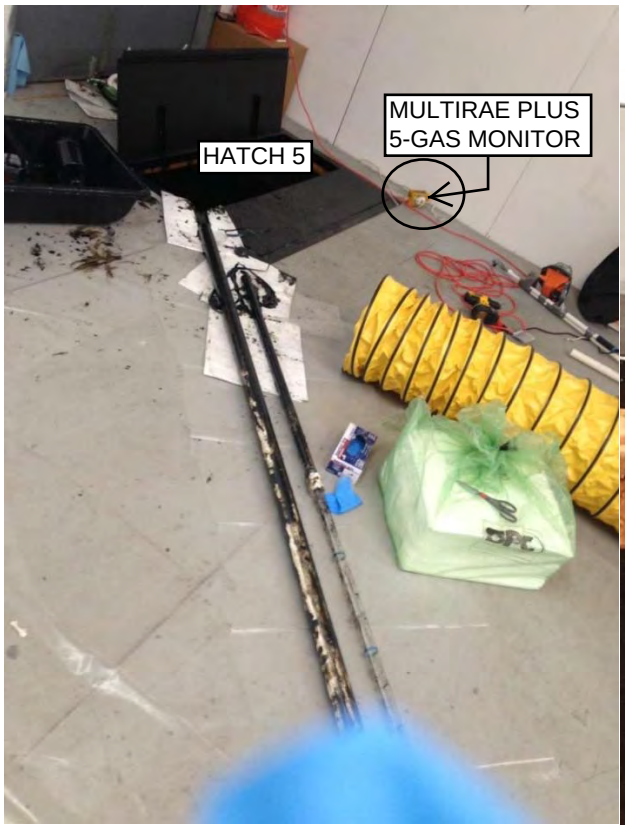


PARSONS

ATTACHMENT A

AIR MONITORING AND VENTILATION

Attachment A. Typical Air Monitoring and
Engineering Control Ventilation Setup
During NAPL Sampling



ATTACHMENT B

PHOTOS

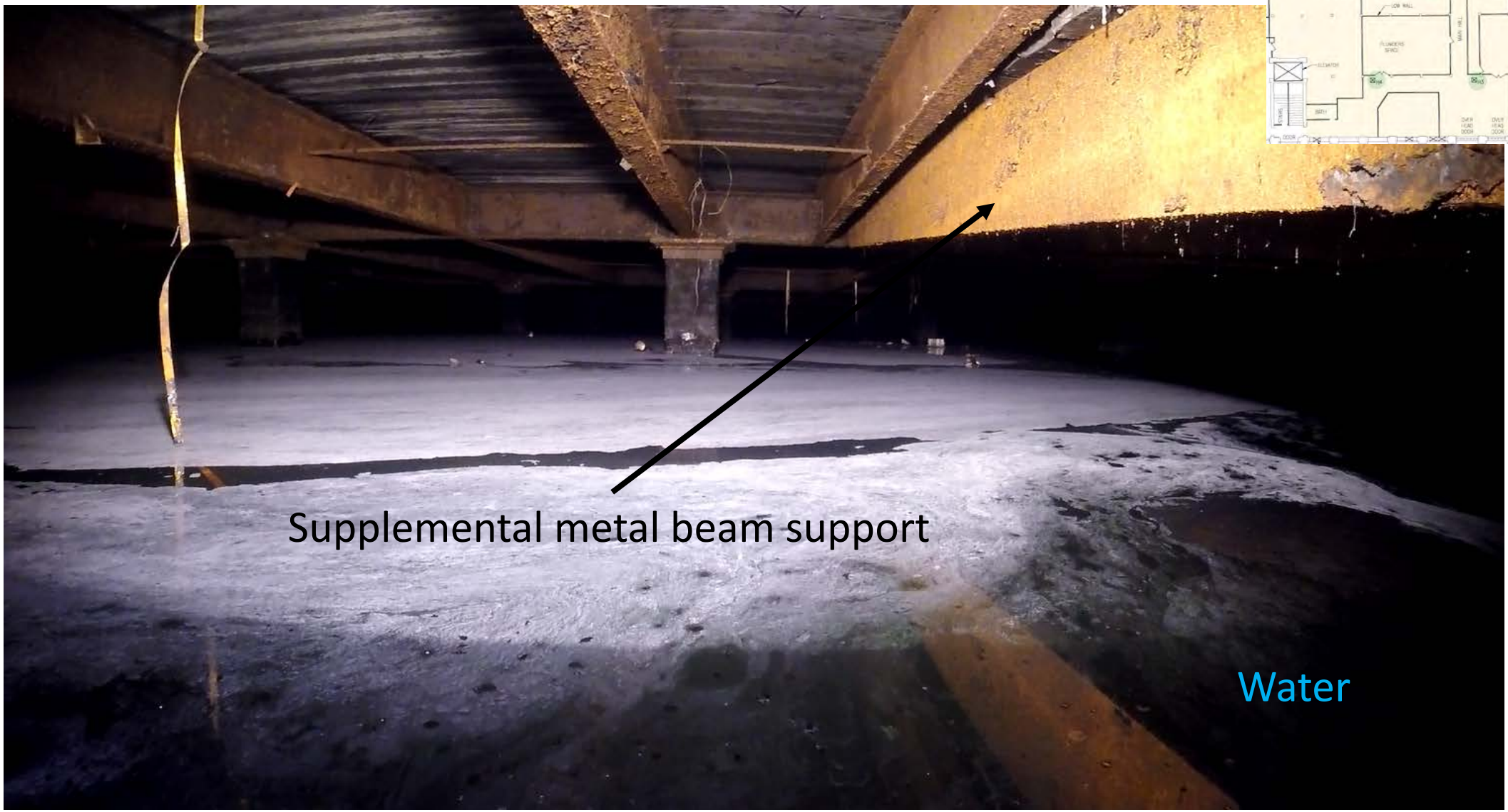
B1. Newly installed hatch (typical).

Opening about 5 ft x 2 ft

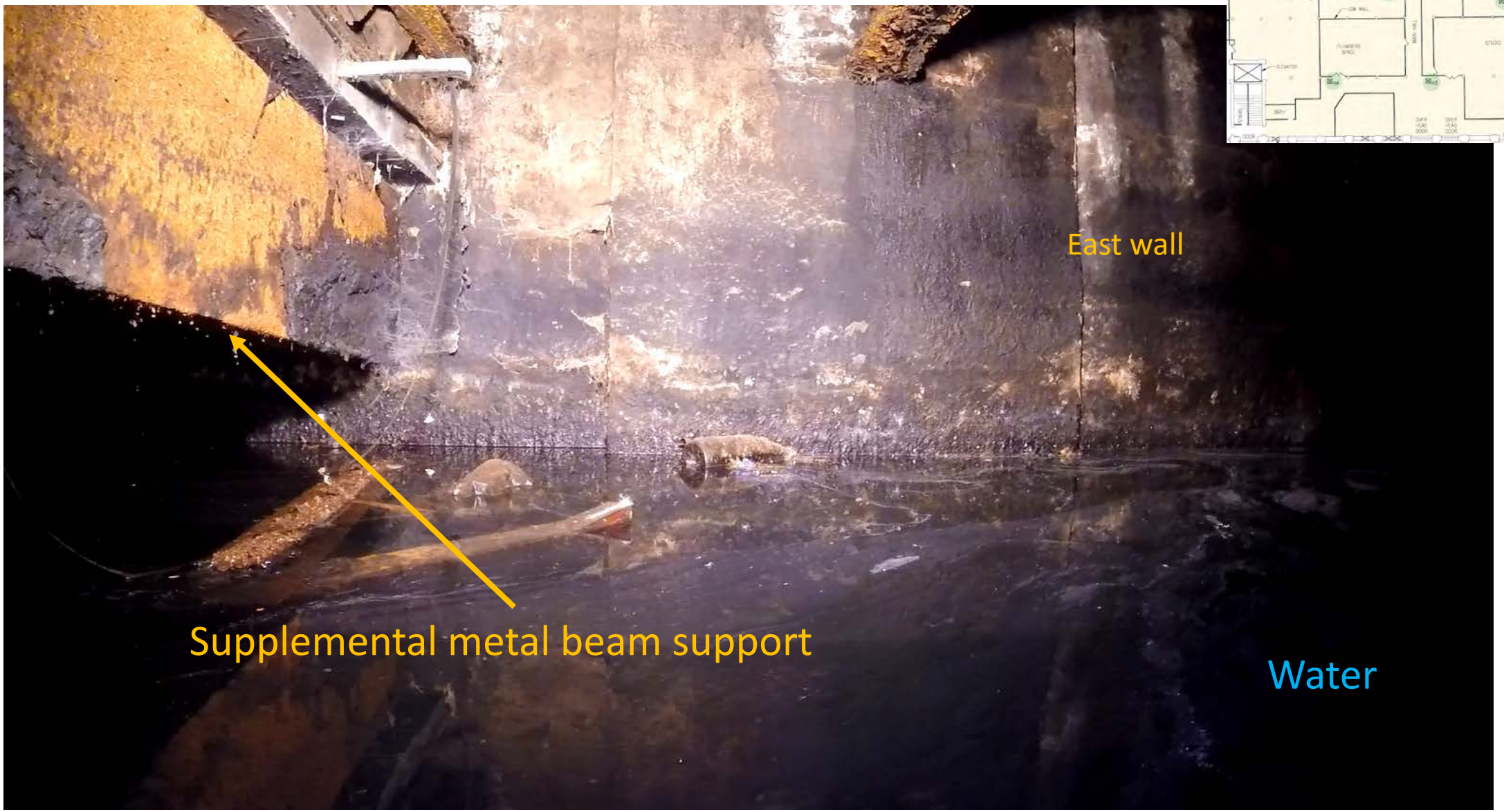
B2. Tar on metal tile probe (typical).

B3. Video Survey – Hatch 1 facing north (toward Sigourney St.).

B4. Video Survey – Hatch 2 facing west (toward Court St.).



B5. Video Survey – Hatch 2 facing east (toward Smith St.).

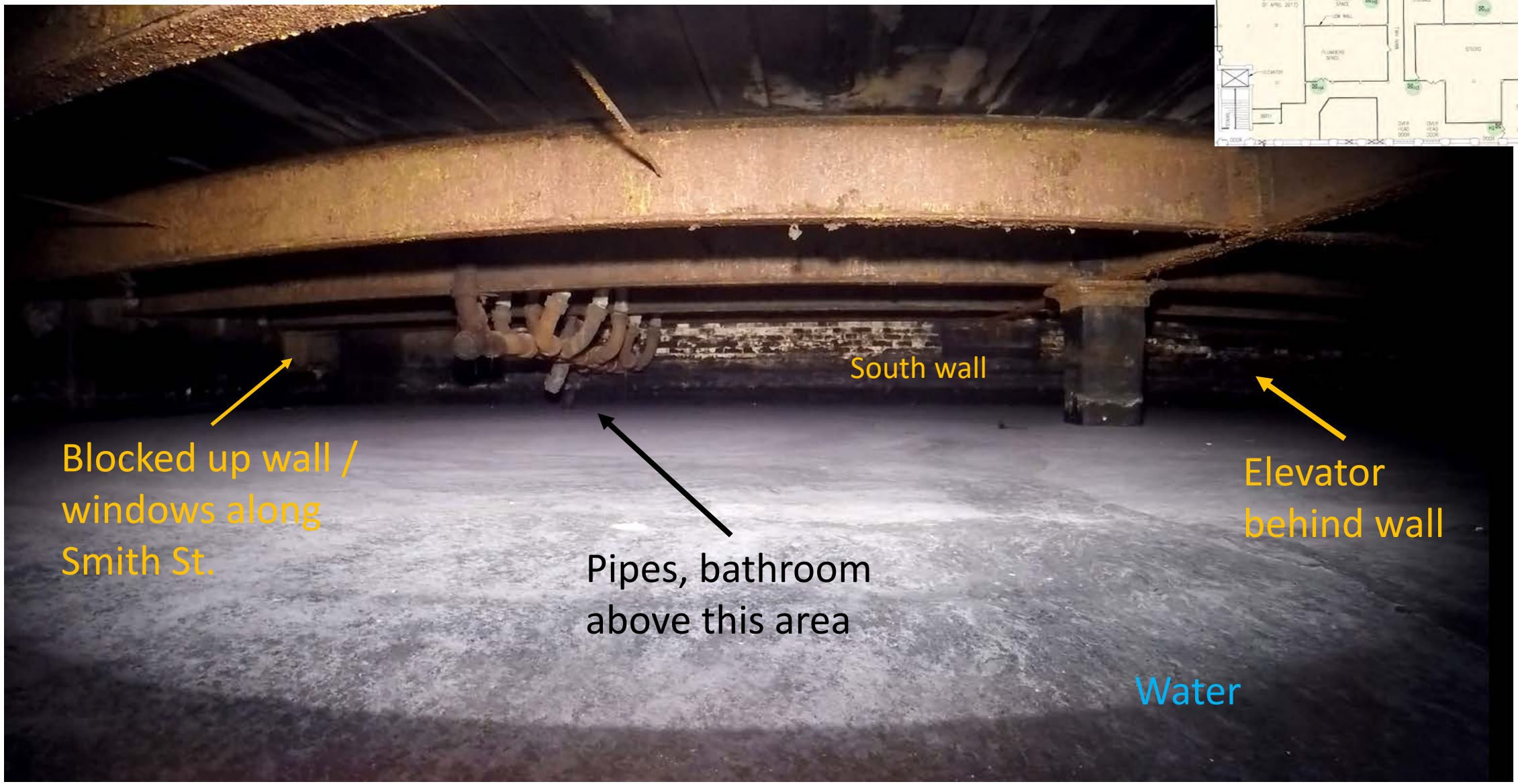


B6. Video Survey – Hatch 3 facing east (toward Smith St.).

B7. Video Survey – Hatch 3 facing east-southeast (toward Smith St.).

B8. Video Survey – Hatch 4 facing northeast (toward Smith).

B9. Video Survey – Hatch 4 facing south (toward Halleck).



B10. Video Survey – Hatch 5 facing west (toward Court St.).

B11. Video Survey – Hatch 6 facing south (toward Halleck).

ATTACHMENT C

VAULT OBSERVATION SUMMARY

Hatch 2

Hatch 2 is located near the building entrance and is the closest hatch to Smith St. and the east wall of the vault. Access in Hatch 2 was limited due to an extra support adjacent to the north side of the hatch opening as shown in Attachment A. Debris such as wood and trash could be seen floating on the surface of the water in addition to a white residue that was present on the water surface at each hatch location. Upon scanning the wall along Smith St. to the east, there was no evidence of any piping protrusions which could function as the source or exit point for the water in the vault.

Hatch 3

Hatch 3 is in the main loading dock area closest to the center of the building. When removing the tile probe, At corner C1, which is the north-western most corner of Hatch 3, debris was felt with the tile probe at 13.53 ft, before it was moved to the side. An obstruction was felt at the depth of about 8 ft while sampling along the north side of the hatch between C1 and C2. Upon scanning the wall along Smith St. to the east, the blocked-up windows were observed and it was confirmed that there would be no need to unblock the windows since doing so would not provide a better vantage point than what had been provided by the hatches.

Hatch 4

Hatch 4 is located near the maintenance desk near the main entrance to the building. Resistance was observed with the tile probe at approximately 14.75 ft to 15.05 ft measured at multiple corners of the hatch, and the bottom depth was assigned to be 15.82 ft based on the deepest depth recorded. Wooden columns appear to support a portion of the floor in the northeasterly direction from Hatch 4, as shown in the photo in Attachment A. Also shown in a photo in Attachment A is the view to the south from Hatch 4, which includes a view of the plumbing pipes and a blocked wall. The elevator pit is assumed to be behind this wall.

Hatch 5

Hatch 5 is in the southwest corner of Unit L. Resistance was observed with the tile probe at approximately 13.5 ft to 13.9 ft, measured at multiple corners of the hatch. Bubbles were observed coming to the surface of the water when using the tile probe. What appeared to be a tar stain on the vault wall potentially reflecting the maximum volume of tar in the vault can be seen in the west facing photo in Attachment A. There was potentially a fair amount of debris at the water/tar interface, as evident by the initial resistance felt by the interface probe at the 13.5 ft depth and again during probing with the tile probe, when a piece of plywood was pierced and brought to the surface.

Hatch 6

Hatch 6 is in the northeast corner of Unit L. Resistance was observed with the tile probe at approximately 12.0 ft to 14.5 ft before a notable breakthrough was encountered. Bubbles were observed coming to the surface of the water when using the tile probe. A fair amount of debris was observed floating on the water in Hatch 6 as observed in the photo in Attachment A. Wood, plastic, and a suitcase where pulled up with the tile probe during the investigation of Hatch 6.

ATTACHMENT C
OBSERVATIONS AT HATCHES

Hatch 1

Hatch 1 is in the tenant space in the northwest corner of the first floor. Hatch 1 was not available for probing during the 2018 sampling event. However, on March 18, 2016, the depth to water was measured to be 4.6 ft from the measuring point and resistance was felt with the interface probe at a depth of 13.5 ft. A 15-ft section of PVC was inserted into the tar to a depth of 15.2 ft, but the bottom was not encountered. Trash and other debris were evident during this investigation. Based on information gathered at the other five hatches in February 2018, it appears that debris was encountered at 13.5 ft and not NAPL. For this reason, the thickness of NAPL and the depth to the bottom of the vault has been estimated based on information gathered from the other five hatches.

APPENDIX B

VAULT HEADSPACE AIR DATA

Table B1. 2019 Results of Tar Vault Headspace Air Analyses
628 Smith Street Property
Brooklyn, New York

			Location ID	USEPA 2001 BASE Indoor Air (90%) (ug/m3)	610-VAULT-HS-5	
			Field Sample ID		610-VAULT-HS-5-031919	
			Sampled		03/20/2019	
			SDG		JC84842	
			Matrix		AIR	
			Purpose		REG	
			Type		AIR-IN	
Method	**Parameter Code**	**Parameter Name**	**Units**			
TO-15	**71-43-2**	**BENZENE**	**ug/m3**	**9.4**	1.3	
TO-15	**100-41-4**	**ETHYLBENZENE**	**ug/m3**	**5.7**	1.1	
TO-15	**108-88-3**	**TOLUENE**	**ug/m3**	**43**	5.3	
TO-15	**95-47-6**	**O-XYLENE**	**ug/m3**	**7.9**	1.6	
TO-15	**XYLENES1314**	**XYLENES, M & P**	**ug/m3**	**--**	3.5	
TO-15	**1330-20-7**	**XYLENES, TOTAL**	**ug/m3**	**7.9**	5.2	
TO-15	**91-20-3**	**NAPHTHALENE**	**ug/m3**	**5.1**	77.1	
Notes:						
1) -- = no published value available.						
2) LT = less than.						
3) AIR-IN is indoor air.						

Table B2. 2018 Results of Tar Vault Headspace Air Analyses
628 Smith Street Property
Brooklyn, New York

			Location ID	USEPA 2001 BASE Indoor Air (90%) (ug/m3)	610 Hatch 5	
			Field Sample ID		610 Hatch 5_032218	
			Sampled		03/22/2018	
			SDG		JC62887	
			Matrix		AIR	
			Purpose		REG	
			Sample Type		AIR-IN	
Method	CAS #	Parameter Name	Units	--		
TO-15	71-55-6	1,1,1-TRICHLOROETHANE	ug/m3	20.6	0.44	U
TO-15	79-34-5	1,1,2,2-TETRACHLOROETHANE	ug/m3	--	0.55	U
TO-15	76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	ug/m3	--	0.61	J
TO-15	79-00-5	1,1,2-TRICHLOROETHANE	ug/m3	LT 1.5	0.44	U
TO-15	75-34-3	1,1-DICHLOROETHANE	ug/m3	LT 0.7	0.65	U
TO-15	75-35-4	1,1-DICHLOROETHENE	ug/m3	LT 1.4	0.13	U
TO-15	120-82-1	1,2,4-TRICHLOROBENZENE	ug/m3	LT 6.8	0.59	UJ
TO-15	95-63-6	1,2,4-TRIMETHYLBENZENE	ug/m3	9.5	36	
TO-15	106-93-4	1,2-DIBROMOETHANE	ug/m3	LT 1.5	0.61	U
TO-15	95-50-1	1,2-DICHLOROBENZENE	ug/m3	LT 1.2	0.19	U
TO-15	107-06-2	1,2-DICHLOROETHANE	ug/m3	LT 0.9	0.65	U
TO-15	78-87-5	1,2-DICHLOROPROPANE	ug/m3	LT 1.6	0.74	U
TO-15	108-67-8	1,3,5-TRIMETHYLBENZENE	ug/m3	3.7	12	
TO-15	541-73-1	1,3-DICHLOROBENZENE	ug/m3	LT 2.4	0.48	U
TO-15	106-46-7	1,4-DICHLOROBENZENE	ug/m3	5.5	0.48	U
TO-15	123-91-1	1,4-DIOXANE	ug/m3	--	0.34	J
TO-15	540-84-1	2,2,4-TRIMETHYLPENTANE	ug/m3	--	3.4	
TO-15	78-93-3	2-BUTANONE	ug/m3	12	6.5	
TO-15	591-78-6	2-HEXANONE	ug/m3	--	0.65	U
TO-15	622-96-8	4-ETHYLTOLUENE	ug/m3	3.6	25	
TO-15	108-10-1	4-METHYL-2-PENTANONE	ug/m3	6	1.1	
TO-15	67-64-1	ACETONE	ug/m3	98.9	53.4	
TO-15	71-43-2	BENZENE	ug/m3	9.4	2.4	
TO-15	75-27-4	BROMODICHLOROMETHANE	ug/m3	--	0.54	U
TO-15	75-25-2	BROMOFORM	ug/m3	--	0.33	U
TO-15	74-83-9	BROMOMETHANE	ug/m3	LT 1.7	0.62	U
TO-15	75-15-0	CARBON DISULFIDE	ug/m3	4.2	0.50	U
TO-15	56-23-5	CARBON TETRACHLORIDE	ug/m3	LT 1.3	0.55	
TO-15	108-90-7	CHLOROBENZENE	ug/m3	LT 0.9	0.74	U
TO-15	75-00-3	CHLOROETHANE	ug/m3	LT 1.1	0.42	U
TO-15	67-66-3	CHLOROFORM	ug/m3	1.1	0.78	U
TO-15	74-87-3	CHLOROMETHANE	ug/m3	3.7	0.33	
TO-15	156-59-2	CIS-1,2-DICHLOROETHENE	ug/m3	LT 1.9	0.13	U
TO-15	10061-01-5	CIS-1,3-DICHLOROPROPENE	ug/m3	LT 2.3	0.73	U
TO-15	110-82-7	CYCLOHEXANE	ug/m3	--	1.3	
TO-15	124-48-1	DIBROMOCHLOROMETHANE	ug/m3	--	0.68	U
TO-15	75-71-8	DICHLORODIFLUOROMETHANE	ug/m3	16.5	2.9	
TO-15	64-17-5	ETHANOL	ug/m3	210	62.0	J
TO-15	100-41-4	ETHYLBENZENE	ug/m3	5.7	17	
TO-15	87-68-3	HEXACHLOROBUTADIENE	ug/m3	LT 6.8	0.77	U
TO-15	1634-04-4	METHYL TERT-BUTYL ETHER	ug/m3	11.5	0.58	U
TO-15	75-09-2	METHYLENE CHLORIDE	ug/m3	10	14	
TO-15	142-82-5	N-HEPTANE	ug/m3	--	14	
TO-15	110-54-3	N-HEXANE	ug/m3	10.2	6.7	
TO-15	91-20-3	NAPHTHALENE	ug/m3	5.1	180	J
TO-15	95-47-6	O-XYLENE	ug/m3	7.9	34	
TO-15	100-42-5	STYRENE	ug/m3	1.9	0.81	
TO-15	75-65-0	TERT-BUTYL ALCOHOL	ug/m3	--	1.0	
TO-15	127-18-4	TETRACHLOROETHENE	ug/m3	15.9	0.81	
TO-15	108-88-3	TOLUENE	ug/m3	43	39.9	
TO-15	156-60-5	TRANS-1,2-DICHLOROETHENE	ug/m3	--	0.63	U
TO-15	10061-02-6	TRANS-1,3-DICHLOROPROPENE	ug/m3	LT 1.3	0.73	U
TO-15	79-01-6	TRICHLOROETHENE	ug/m3	4.2	0.17	U
TO-15	75-69-4	TRICHLOROFLUOROMETHANE	ug/m3	18.1	1.8	
TO-15	75-01-4	VINYL CHLORIDE	ug/m3	LT 1.9	0.082	U
TO-15	XYLENES1314	XYLENES, M & P	ug/m3	--	85.1	
TO-15	1330-20-7	XYLENES, TOTAL	ug/m3	7.9	119	
Notes:						
1) -- = no published value available.						
2) LT = less than.						
3) AIR-IN is indoor air.						

APPENDIX C

TECHNICAL SPECIFICATIONS

PARSONS

SPECIFICATION NO: 02010

SPECIFICATION TITLE: PROTECTION OF BUILDING STRUCTURE AND SURFACES

PROJECT NO: 450881

PROJECT TITLE: SMITH STREET – TAR VAULT REMEDIATION

CLIENT: HONEYWELL

				APPROVALS		
Issue	**Date**	**Pages**	**Issue Description**	**Prepared**	**Checked**	**Approved**
0	2/5/2019	7	Issued for Bid	SSL/JB	JMO	CFB

☒ Entire Specification Issued this Revision

☐ Revised Pages Only Issued this Revision

SPECIFICATION ISSUED FOR:

☐ In-house Review
☐ Client Review/Approval
☐ Information Only
☒ Bid
☐ Construction
☐ *Other*

PART 1 GENERAL

1.1 DESCRIPTION

A. The Work specified in this Section consists of all labor, equipment, tools, materials, services, supervision and incidentals necessary to protect the existing structure and related surfaces and appurtenances from damage during the performance of the Work as described herein, shown on the Contract Drawings, or as directed by the Engineer.

1. Areas to be protected include but are not limited to the tar vault, openings and passageways to the tar vault, the first floor, street entrances, outside staging and material storage.
2. Items to be protected include but are not limited to: floor joists, columns, walls, floors, ceilings, stairs, doors, windows, overhead equipment (e.g., sprinkler system, ductwork, and lighting) and building appurtenances.
3. Damage includes but is not limited to staining or discoloration of surfaces, degradation of surfaces, warpage, and/or physical damage (e.g., from weight or impact).

1.2 PERFORMANCE REQUIREMENTS

A. The Subcontractor shall comply with all applicable Federal, State, City, and other Local codes, ordinances, regulations, statutes and standards.

B. The Subcontractor shall obtain and operate within all applicable Local, City, State, and Federal permits. Any and all civil, criminal, and monetary penalties associated with non-compliance in any regard shall be the responsibility of the Subcontractor.

C. The Subcontractor shall:

1. Protect the building from all damage during the performance of the Work.
2. Promptly clean-up releases of tar and other work-related substances to prevent damage to surfaces and tracking.
3. Repair any damage caused by Subcontractor activities at no additional cost. Repairs shall at a minimum restore structure or surfaces to pre-work conditions as accepted by the Engineer.
4. Develop and implement a Fire Prevention Plan.

1.3 REFERENCES

A. OSHA 29 CFR Part 1910, Occupational Safety and Health Standards

B. NFPA 30, Flammable and Combustible Liquids Code, 2018 Edition

C. NFPA 70, National Electrical Code, 2017 Edition

D. NFPA 241 Safeguarding Construction, Alteration and Demolition Operations, 2019 Edition

E. NFPA 704, Standard System for the Identification of the Hazards of Materials for Emergency Response, 2017 Edition

F. American Petroleum Institute 1604 Closure of Underground Petroleum Storage Tanks – Third Edition March 1996.

1.4 SUBMITTALS

A. Prework Site Conditions Report: Photographs or video documenting all areas of the building and exterior surfaces that could potentially be impacted by the Work. Photo documentation shall be in accordance with Honeywell Procedure RES-CP-DC-09 "Photo Documentation".

1. Surfaces – Document the conditions of all floors, walls, ceilings, stairs, windows, doors and appurtenances, exterior stairs, sidewalks, road surfaces using photographs with date/time stamps and with locations shown on drawings. Note all existing damage.
2. Structural concerns – Document and measure any cracks, settlement, rusting of structural elements or other issues that exist in the area of Work.
3. If any of such concerns could present potential problems with respect to structural stability during material removal and use of heavy equipment in the area, report such concerns to the Engineer in this report and prior to mobilization.

B. Building Protective Measures Plan: Submit a Building Protective Measures Plan that indicates the measures proposed for protecting property. Indicate materials, means and methods and proposed locations and construction of features.

C. Fire Prevention Plan:

1. Plan to include mitigation of hazardous conditions associated with the storage and/or transfer of a Class IIIA Combustible Liquid in a quantity greater than the Maximum Allowable Quantities (MAQ) permitted by the building code for the interim period of the cleanup/removal and include the following:
    a. Continuous monitoring of the air space in the vault for conditions related to the LFLs or LELs with warnings provided at 25% of the LFLs/LELs.
    b. Continuous Fire Watch.
    c. Control of ignition sources.
2. All equipment utilized in the removal of the tar and other vault contents shall be intrinsically safe for the location it is used in, and for specific use with a Class IIIA Combustible Liquid in accordance with NFPA 70.
3. Transfer of liquids among vessels, containers, tanks and piping systems by means of air or inert gas pressure shall be permitted only under all of the following conditions:

a. The vessels, containers, tanks, and piping systems shall be designed for such pressurized transfer and shall be capable of withstanding the anticipated operating pressure.

b. Safety and operating controls, including pressure relief devices, shall be provided to prevent overpressure of any part of the system.

c. Only inert gas shall be used to transfer Class III liquids that are heated above their flash points.

i. One sample of tar tested had a closed cup flash point of 184 degrees F. Other samples of tar had closed cup flash points of 200 degrees F. Both flash points result in the classification of the liquid as a Class III liquid. The sample with flash point under 200 degrees F is a Class III A and the other samples would be Class III B. Heating of the tar to a temperature above 150 degrees F should be avoided.

4. Means shall be provided to contain and dispose of any leakage and spills promptly and safely.

5. The Fire Prevention Plan shall be reviewed and approved by the Authority Having Jurisdiction and the Fire Department of New York (FDNY) prior to start of work in accordance with NFPA 241 Section 7.1.2 (5) which requires development of a pre-fire plan.

6. The Fire Prevention Plan shall include details of a site-specific Fire Safety Program that addresses all of the following items:

a. Good Housekeeping

b. On-Site security

c. Preservation of existing fire protection systems

d. Development of a pre-fire plan with the local fire department

e. Rapid communication

f. Consideration of special hazards

D. Site Access and Traffic Control Plan. Indicate the following:

1. Subcontractor's plan to access the tar vault, including required exclusion zones, staging areas, temporary use of building rooms and corridors, and required temporary building modifications, if any.

2. Traffic control plan, including measured required to coordinate site-related vehicles to and from the facility, and other traffic around the work zone.

E. Schedule of Demolition Activities (as applicable): Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's site operations are uninterrupted.

2. Interruption of utility services. Indicate how long utility services will be interrupted, minimizing impacts on owners and tenants.

1.5 QUALITY CONTROL

A. The Subcontractor shall perform daily inspection of all surfaces and document damage in a checklist provided to the Engineer. Reports to the Engineer shall include measurements of cracks or other areas of damage to define the extent of the impact.

1. Any damage to the structure or surfaces shall be repaired by the Subcontractor at no additional cost.
2. Should the source of damage to the structure or surfaces be on-going, the operation causing the damage may be shut down at the discretion of the Engineer, until the source of damage is controlled, at no additional cost.

B. The Engineer will perform periodic inspections. If damage is observed during inspections, it shall be repaired by the Subcontractor at no additional cost.

1.6 FIRE PREVENTION

A. Comply with NFPA 30, USDOT requirements and all applicable NYC and NYS codes.

B. Comply with NFPA 241 requirements unless otherwise indicated. Comply with Owner's Fire Protection regulations and guidelines.

C. Maintain the use of existing utilities serving other areas of the building. In particular, maintain fire protection services (sprinkler system, alarms, etc.) within the building.

D. Develop and implement a Fire Prevention Plan for the Work. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

E. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work. If combustible material cannot be removed, provide fire blankets to cover such materials

F. Provide and maintain fire control devices such as fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in the work area.

1.7 ISOLATION OF WORK ZONES

A. Prevent dust, fumes, and odors from entering occupied areas.

1. Prior to commencing work, isolate the HVAC system in area where work is to be performed.
2. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
3. Maintain ventilation with the building and negative air pressure within work area in accordance with Specification 02050, Building Ventilation and Odor Control.

1.8 PROJECT AND SITE CONDITIONS

A. The Subcontractor shall carefully examine the site to determine the full extent, nature and location of work required to conform to the Contract Drawings and Specifications. The Subcontractor shall bring any inaccuracies or discrepancies between the Contract Drawings and Specifications to the Engineer's attention in order to clarify the exact nature of the Work to be performed.

PART 2 PRODUCTS

2.1 GENERAL

A. Any products to be used for protection of surfaces shall be included the Building Protective Measures Plan submittal. Subcontractor shall propose measures and products to protect structure and surfaces consistent with its means and methods to perform the Work.

B. Subcontractor shall protect floor joists, columns, walls, floors, ceilings, stairs, doors, windows, overhead equipment (e.g., sprinkler system, ductwork, and lighting) and building appurtenances using products with appropriate strength and impact resistance to protect the surface behind from personnel, carts, tools, flying debris, fork trucks, solvents, or other materials utilized during the performance of the work, as well as from the materials (e.g., tar) being removed.

2.2 TYPICAL PRODUCTS

A. Types of products utilized protection of walls and floors include, but are not limited to:

1. Ram Board 38-inch wide rolls, 100-ft long blend of flexible bendable 100% recycled fibers, fiber scrap, fiber waste and reinforcement forming a protective barrier for walls and floors. Joints between adjacent widths are taped to protect surface behind.
    a. floor protection, foot traffic and cart traffic
    b. wall protection light impact
2. Hardboard (Masonite) 1/8-inch x 4-ft x 8-ft with joints taped (rosin paper or bldg. paper underlay optional)
    a. floor protection, foot traffic and cart traffic;
    b. wall protection light impact
3. Marlite FRP panels 3/32-inch x 4-ft x 8-ft
    a. wall protection, light to medium impact
4. Durock ½-inch x 4-ft x 8-ft fiberglass wrapped wallboard
    a. wall impact protection, heavier impact
5. Homasote wood fiber building board ½-inch x 4-ft x 8-ft
    a. wall impact protection, heavier impact
6. Polypropylene fiber tiles, "Floor Safe" ¼-inch x 39-inch x 39-inch
    a. floor protection, heavier impact

7. Diamond patterned steel plate
    a. wall or floor protection, heavy duty protection
8. Plastic door jamb protectors – formed plastic door jamb overlays
    a. door opening protection
9. Old tires
    a. walls protection from fork truck impact – heaviest protection
10. Other methods or materials as recommended by the Subcontractor and successfully utilized previously by the Subcontractor, as indicated with specific project references, and accepted by the Engineer.

PART 3 EXECUTION

3.1 GENERAL

A. The Subcontractor shall protect the structure and all surfaces in accordance with the submitted and accepted Building Protective Measures Plan. If the means and methods in the accepted Building Protective Measures Plan prove inadequate during execution, the Subcontractor shall implement additional measures as required at no additional cost.

B. The Subcontractor shall promptly clean-up releases of tar and other work-related substances to prevent damage to surfaces and tracking.

C. The Subcontractor shall repair all damage to structure or surfaces at no additional cost. Repairs shall at a minimum restore structure or surfaces to pre-work conditions as accepted by the Engineer.

D. The Subcontractor shall implement a Fire Prevention Plan.

E. During removal of vault contents, the Subcontractor shall inform the Engineer of any surfaces or structural elements found to be damaged or failing, not previously observed due to coverage with vault contents.

3.2 FINAL INSPECTION

A. The Subcontractor shall remove all temporary protective measures, associated adhesive, barriers, signage, etc. from work area after all work is complete.

B. The Subcontractor shall remove all residual staining of tar or other work-related substances, if any.

C. The Subcontractor shall repair all damages to structures and surfaces, if any.

D. The Engineer shall inspect the work area after construction is complete for damages the structure or to existing surfaces. A punch list of found damages will be prepared and given to the Subcontractor for repair. The Subcontractor shall repair damages resulting from construction. Repairs shall at a minimum restore structure or surfaces to pre-work conditions as accepted by the Engineer.

END OF SECTION

SPECIFICATION NO: **02040**

SPECIFICATION TITLE: **TEMPORARY CONSTRUCTION WATER DEWATERING AND TREAMENT**

PROJECT NO: **450881**

PROJECT TITLE: **SMITH STREET – TAR VAULT REMEDIATION**

CLIENT: **HONEYWELL**

				APPROVALS		
Issue	**Date**	**Pages**	**Issue Description**	**Prepared**	**Checked**	**Approved**
0	2/5/2019	10	Issued For Bid	JMO	MNM/MD	CFB

☒ Entire Specification Issued this Revision

☐ Revised Pages Only Issued this Revision

SPECIFICATION ISSUED FOR:

☐	In-house Review	☒	Bid
☐	Client Review/Approval	☐	Construction
☐	Information Only	☐	*Other*

PART 1 GENERAL

1.1 DESCRIPTION

A. The Work specified in this Section consists of all labor, equipment, tools, materials, services, supervision and incidentals necessary to collect, handle, store, analyze, treat, transport and dispose of construction water and associated residuals as described herein, shown on the Contract Drawings, or as directed by the Engineer. Work in this Section includes, but is not limited to:

1. The development of a Construction Water Management Plan detailing the collection, handling, storage, analysis, treatment, transportation and disposal of all construction water, and associated residuals, generated during dewatering operations.
2. Provision of all labor, equipment, tools, materials, services, supervision and incidentals required for the collection, handling, storage, analysis, treatment, transportation and disposal of all construction water and associated residual solids in accordance with the approved Construction Water Management Plan, including the provision and operation of a temporary construction water dewatering and treatment system.
3. Performance of all specified and necessary sampling and analyses to ensure compliance with the Contract Documents, required permits, applicable Federal, State and Local codes, ordinances, regulations, statutes and standards.

1.2 PERFORMANCE REQUIREMENTS

A. The Subcontractor shall comply with all applicable Federal, State and Local codes, ordinances, regulations, statutes and standards.

B. The Subcontractor shall obtain all applicable Local, State, and Federal permits and requirements necessary to implement the proposed Construction Water Management Plan, except for those obtained by the Owner. The Subcontractor shall operate within all applicable Local, State, and Federal permits and requirements necessary to implement the proposed Construction Water Management Plan. Any and all civil, criminal, and monetary penalties associated with non-compliance in any regard shall be the responsibility of the Subcontractor.

C. The Subcontractor shall provide all labor, equipment, tools, materials, services, supervision and incidentals necessary to collect, handle, store, analyze, treat, transport and dispose of construction water and associated residuals to meet the performance requirements described herein.

1.3 REFERENCES

A. New York City Department of Environmental Protection (NYCDEP) Sewer Use Regulations established in Title 15 of the Rules of the City of New York Chapter 19.

B. NYCDEC Water Quality Control Application (WQCA) for Discharge to Sanitary Sewer [NYCO Environmental & Dewatering Corp., February 4, 2019], including discharge limitations provided as Table A in this specification.

C. NYCDEC Bureau of Water and Sewer Operations Discharge Approval (Pending)

D. Specification 01100 – Remedial Construction and OM&M Requirements

1.4 DEFINITIONS

A. Construction Water shall be defined as the following:

1. Dewatering water from the tar vault (initial dewatering and maintenance dewatering), including water that has come in direct contact with tar and associated residuals.

2. Liquids collected in secondary containment devices. (Temporary construction water dewatering and treatment system tanks and vessels shall be provided with secondary containment devices).

B. Construction Water shall not include the following, which shall be collected and managed separately in accordance with Specification 02070 "Tar Vault Clean-out":

1. Tar, Dense Non-Aqueous Phase Liquid (DNAPL), or water containing these materials as a free phase (e.g., entrained drops or globules).

2. Liquids generated during equipment decontamination activities.

1.5 SUBMITTALS

A. Construction Water Management Plan: Submit a Construction Water Management Plan, detailing the collection, handling, storage, analysis, treatment, transportation and disposal of all construction water, and associated residuals generated during operation. Include:

1. A description of proposed construction water management procedures.
2. A proposed layout of all equipment, including pumping equipment and piping, treatment equipment, and discharge points and related structures.
3. A description of all equipment to be provided, including shop drawings demonstrating compliance with the requirements of this specification.
4. Name and qualifications of Independent Testing Laboratory.
5. Commissioning Plan and Operations, Maintenance, and Monitoring Plan per Specification 01100.
6. Residuals Management Plan, including Subcontractor's proposed approach to secure store, characterize, and dispose of water treatment residuals, including but not limited to: filter media; carbon; absorbent pads; solids, trash and debris recovered from the vault during dewatering operations; and equipment decontamination water. Integrate with Project Waste / Materials Management Plan described in Specification 02070 – "Tar Vault Clean-Out".

B. Test results as specified herein shall be submitted to the Engineer for review immediately upon receipt of results:
   1. Influent
   2. Effluent

1.6 QUALITY CONTROL

A. The temporary construction water dewatering and treatment system shall be constructed and operated in accordance with:
   1. All applicable federal, state, and local codes, ordinances, regulations, statutes, and standards.
   2. All applicable permits, including Water Quality Control Application (WQCA) for Discharge to Sanitary Sewer [NYCO Environmental & Dewatering Corp.], including discharge limitations provided as Table A in this specification.
   3. Specification 01100 – Remedial Construction and OM&M Requirements
   4. The approved Construction Water Management Plan

B. All provided equipment shall be designed and manufactured in accordance with all applicable requirements of the latest editions of standards published by the following agencies and authorities, and shall be fully functional and fit for service:
   1. American National Standards Institute (ANSI)
   2. American Society of Testing and Materials (ASTM)
   3. American Society of Mechanical Engineers (ASME)
   4. International Electrical Commission (IEC)
   5. National Electric Code (NEC)
   6. Institute of Electrical & Electronic Engineers (IEEE), including but not limited to IEEE 446 – Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Operations
   7. National Electrical Manufacturer's Association (NEMA), including but not limited to NEMA MG 1- Motors and Generators.
   8. NFPA 30: Flammable and Combustible Liquids Code
   9. NFPA 70: National Electric Code
   10. OSHA (Occupational Safety and Health Administration) Standard 29 CFR Part 1910, including but not limited to Subpart O for equipment guarding.
   11. Underwriter's Laboratories, Inc (UL)
   12. Other standards as described in Specification 01100.

1.7 PROJECT AND SITE CONDITIONS

A. The Subcontractor shall carefully examine the site to determine the full extent, nature and location of work required to conform to the Contract Drawings and Specifications. The Subcontractor shall bring any inaccuracies or discrepancies between the Contract Drawings and Specifications to the Engineer's attention in order to clarify the exact nature of the Work to be performed.

PART 2 PRODUCTS

2.1 TEMPORARY CONSTRUCTION WATER DEWATERING AND TREATMENT SYSTEM

A. The Subcontractor shall provide a Temporary Construction Water Dewatering and Treatment System in accordance with the conceptual design attached to Water Quality Control Application (WQCA) for Discharge to Sanitary Sewer [NYCO Environmental & Dewatering Corp.]. The Subcontractor shall provide all required equipment, pumps, piping, hoses, power, panels, disconnects, controls, appurtenances, and all incidentals required for a complete and operable system, whether shown or not on the conceptual design.

B. The system shall be capable of recovering and treating up to 125 gallons per minute vault water, and shall be capable of 24-hour per day, 7-day per week operations. The system provided shall be capable of treating Construction Water to the limits identified in Table A of this specification.

C. All provided equipment shall meet or exceed the performance specifications of the equipment identified in the Water Quality Control Application (WQCA) for Discharge to Sanitary Sewer [NYCO Environmental & Dewatering Corp.].

D. The Temporary Construction Water Dewatering and Treatment System shall include, but not be limited to, the following elements, as further described in the Water Quality Control Application (WQCA) for Discharge to Sanitary Sewer [NYCO Environmental & Dewatering Corp.]:

1. Vault dewatering pumps (submersible) and hoses
2. 21,000-gallon open top weir tank to remove debris, settleable solids, and light non-aqueous phase liquids. Include provision (e.g., absorbent pads) for recovery of sheens.
3. Duplex pump skip(s) with pumps sized to pump water from the weir tank through the entire treatment train to the discharge point, taking into account loading on all carbon and filter media.
4. Bag filter skid(s), with a minimum of two 50-micron bag filters in parallel prior to entering the weir tank, and two 5-micro bag filters in parallel following the weir tank, each capable of a minimum flow rate of 125 gallons per minute.
5. Carbon cannister skid(s), with a minimum of four 2000-pound carbon canisters (two parallel sets of two cannisters in series), with each set capable of a

minimum flow rate of 125 gallons per minute. Provided carbon shall be AquaCarb 1240C or equal.

6. Flowmeter. Micrometer MW500, or equivalent.
7. Portable generator, capable of powering provided temporary construction water dewatering and treatment system. Generator shall meet all applicable OSHA, IEEE, NEMA, NEC, and ANSI requirements. All internal combustion engines shall be equipped with mufflers on the engine exhaust. Mufflers shall achieve residential or better sound attenuation (i.e., 18 to 25 dB attenuation).

E. The Temporary Construction Water Dewatering and Treatment System shall discharge to the building's existing 8-inch sanitary connection, as show on Figure 3 in the Water Quality Control Application (WQCA) for Discharge to Sanitary Sewer [NYCO Environmental & Dewatering Corp.]. The Subcontractor shall provide all required piping and appurtenances to make that connection.

F. Safety.

1. All equipment shall be designed, manufactured, and provided with due regard to safety of operation, accessibility, and durability of parts, and shall comply with all applicable local, state, and federal safety regulations, including but not limited to the following:
    a. All rotating equipment shall be provided with appropriate guards in compliance with OSHA Standard 29 CFR Part 1910, Subpart O.
    b. Appurtenances shall include OSHA 29 CFR 1910 Subpart D compliant stairway with railings and slip-resistant tread for elevated locations requiring employee access for operation and maintenance.
2. Provide temporary fencing or similar form of barrier to prevent access to the equipment by the public.
3. All equipment located within the tar vault or exposed to tar vault atmosphere shall be intrinsically safe for the location it is used in, and for specific use with a Class IIIA Combustible Liquid in accordance with NFPA 70.
4. Lifting Lugs and Anchor Systems. All equipment shall be provided with suitable lifting lugs and anchor systems. Subcontractor shall submit details of lifting lugs and anchor systems, and a lift plan, to Engineer for approval.
5. Pressure / Vacuum Relief. All Subcontractor provided piping and equipment shall be rated to withstand the maximum pump discharge pressure (shutoff head) or appropriate pressure relief shall be provided. Pressure relief shall discharge to a safe location.

2.2 FILTER MEDIA, CARBON AND CONSUMABLES

A. The Subcontractor shall provide filter media, carbon, and other consumables, as required to treat construction water to all required permit limits, including those identified in Table A of this specification. Filter media, carbon, and consumables shall

be fully compatible with the provided equipment and the characteristics of the construction water.

PART 3 EXECUTION

3.1 CONSTRUCTION WATER DEWATERING AND TREATMENT SYSTEM MOBILIIZATION, INSTALLATION AND COMMISSIONING

A. The Subcontractor shall furnish and install all required equipment in accordance with this specification, Specification 01100, and other Contract requirements, to provide for a complete and operable system.

B. Following acceptance of the installation by the Engineer, the Subcontractor shall commission the Construction Water Dewatering and Treatment System in accordance with Specification 01100 and the approved Commissioning Plan.

3.2 CONSTRUCTION WATER DEWATERING AND TREATMENT SYSTEM OPERATION

A. Following acceptance of commissioning by the Engineer, the Subcontractor shall operate the Construction Water Dewatering and Treatment System in accordance with the approved Operations, Maintenance, and Monitoring Plan and in accordance with all applicable Federal, State, and local codes, ordinances, regulations, statutes, standards, and permits.

B. Dewatering operations shall consist of two phases:

1. Initial dewatering. The Subcontractor shall operate the construction water dewatering and treatment system to initially dewater the tar vault. The Subcontractor shall provide for 24-hr, 7-day per week operation during this phase of work.
2. Maintenance dewatering. Following initiation of tar removal operations, the Subcontractor shall operate the construction water dewatering and treatment system to remove storm water and groundwater that infiltrates into the tar vault.

C. The Subcontractor shall staff the construction water dewatering and treatment system during all periods of operation.

D. The construction water dewatering and treatment system is intended to manage water overlying tar in the tar vault only and shall not be used to remove or treat tar or dense non-aqueous phase liquids (DNAPL) from the tar vault. The Subcontractor shall take care not to draw these materials into the system. The Subcontractor shall separately collect water containing tar and DNAPL and manage that material separately off-site.

E. The loss of fines (i.e., from outside of the tar vault) shall be minimized during dewatering operations. If excessive fines are observed in the discharge from any submersible pump, pumping shall cease, and the issue shall be identified to the Engineer. The Subcontractor shall implement mitigative measures, which may include relocating the submersible pump or lowering the pumping rate.

3.3 CONSTRUCTION WATER DEWATERING AND TREATMENT SYSTEM PERFORMANCE MONITORING

A. The Subcontractor shall collect and analyze all permit-required water quality influent and effluent samples and submit the results to the Engineer 5 days prior to required submittal to the pertinent regulatory agency. The Subcontractor shall make provision for splitting all samples with the Engineer if requested. The Subcontractor shall assume the following sampling and analyses program:

1. Samples shall be collected from the weir tank and from sampling ports located between and after the carbon canisters.
2. An initial round of compliance samples shall be collected during the first day of active discharge; subsequent compliance samples shall be collected at a frequency of once per 500,000 gallons. Subcontractor may collect and analyze additional performance samples as required to detect breakthrough and to prevent excursions of the discharge limitations presented in Table A.
3. Compliance and performance samples shall be analyzed by a New York State Department of Health certified waste water laboratory. Compliance samples shall be analyzed for the NYCDEP effluent discharge parameters listed on Table A; performance samples may be analyzed for a focused subset of these parameters at the discretion of the Subcontractor.

B. If any sample collected between or after the carbon cannisters does not meet permit requirements, including those provided as Table A to this specification, the Subcontractor shall take immediate action to correct, including but not limited to the following:

1. Adjustment of the elevation and/or location of submersible pump intakes.
2. Replacing filters and/or carbon cannisters.
3. Other actions as proposed by the Subcontractor and accepted by the Engineer.
4. Other actions as directed by the Engineer.

3.4 MANAGEMENT OF WATER TREATMENT RESIDUALS

A. The Subcontractor shall provide a means of secure storage of all water treatment residuals, including but not limited to: filter media; carbon; absorbent pads; solids, trash and debris recovered from the vault during dewatering operations; and equipment decontamination water.

B. The Subcontractor shall characterize and dispose all water treatment residuals in accordance with the approved Residuals Management Plan.

3.5 DECOMMISSIONING AND DEMOBILIZATION

A. Following Engineer's acceptance of Substantial Completion of Work, the Subcontractor shall decommission the construction water dewatering and treatment system, to include breakdown and decontamination of all equipment. All

decontamination fluids and materials shall be managed in accordance with the approved Residuals Management Plan.

B. Following decommissioning, the Subcontractor shall remove all equipment, materials, and residuals from the Site, and shall restore all damaged surfaces at no additional cost to the Owner.

TABLE A
LIMITATIONS FOR EFFLUENT TO *SANITARY OR COMBINED* SEWERS

Parameter[1]	Daily Limit	Units	Sample Type	Monthly Limit
Non-polar material[2]	50	mg/l	Instantaneous	---
pH	5-12	SU's	Instantaneous	---
Temperature	< 150	Degree F	Instantaneous	---
Flash Point	> 140	Degree F	Instantaneous	---
Cadmium	2 0.69	mg/l mg/l	Instantaneous Composite	--- ---
Chromium (VI)	5	mg/l	Instantaneous	---
Copper	5	mg/l	Instantaneous	---
Lead	2	mg/l	Instantaneous	---
Mercury	0.05	mg/l	Instantaneous	---
Nickel	3	mg/l	Instantaneous	---
Zinc	5	mg/l	Instantaneous	---
Benzene	134	ppb	Instantaneous	57
Carbontetrachloride	---	---	Composite	---
Chloroform	---	---	Composite	---
1,4 Dichlorobenzene	---	---	Composite	---
Ethylbenzene	380	ppb	Instantaneous	142
MTBE (Methyl-Tert-Butyl-Ether)	50	ppb	Instantaneous	---
Naphthalene	47	ppb	Composite	19
Phenol	---	---	Composite	---
Tetrachloroethylene (Perc)	20	ppb	Instantaneous	---
Toluene	74	ppb	Instantaneous	28
1,2,4 Trichlorobenzene	---	---	Composite	---
1,1,1 Trichloroethane	---	---	Composite	---
Xylenes (Total)	74	ppb	Instantaneous	28
PCBs (Total)[3]	1	ppb	Composite	---
Total Suspended Solids (TSS)	350[4]	mg/l	Instantaneous	---

CBOD[5]	---	---	Composite	---
Chloride[5]	---	---	Instantaneous	---
Total Nitrogen[5]	---	---	Composite	---
Total Solids[5]	---	---	Instantaneous	---
Other				

1 All handling and preservation of collected samples and laboratory analyses of samples shall be performed in accordance with 40 C.F.R. pt. 136. If 40 C.F.R. pt. 136 does not cover the pollutant in question, the handling, preservation, and analysis must be performed in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater." All analyses shall be performed using a detection level less than the lowest applicable regulatory discharge limit. If a parameter does not have a limit, then the detection level is defined as the least of the Practical Quantitation Limits identified in NYSDEC's Analytical Detectability and Quantitation Guidelines for Selected Environmental Parameters, December 1988.

2 Analysis for ***non-polar materials*** must be done by EPA method 1664 Rev. A. Non-Polar Material shall mean that portion of the oil and grease that is not eliminated from a solution containing N–Hexane, or any other extraction solvent the EPA shall prescribe, by silica gel absorption.

3 Analysis for PCB=s is required if ***both*** conditions listed below are met:
1) if proposed discharge ≥ 10,000 gpd;
2) if duration of a discharge > 10 days.
Analysis for PCB=s must be done by EPA method 608 with MDL=<65 ppt. PCB's (total) is the sum of PCB-1242 (Arochlor 1242), PCB-1254 (Arochlor 1254), PCB-1221 (Arochlor 1221), PCB-1232 (Arochlor 1232), PCB-1248
(Arochlor 1248), PCB-1260 (Arochlor 1260) and PCB-1016 (Arochlor 1016).

4 For discharge ≥ 10,000 gpd, the TSS limit is 350 mg/l. For discharge < 10,000 gpd, the limit is determined on a case by case basis.

5 Analysis for Carbonaceous Biochemical Oxygen Demand (CBOD), Chloride, Total Solids and Total Nitrogen are required if proposed discharge ≥ 10,000 gpd. Total Nitrogen = Total Kjeldahl Nitrogen (TKN) + Nitrite (NO_2) + Nitrate (NO_3).

END OF SECTION

SPECIFICATION NO: **02050**

SPECIFICATION TITLE: **BUILDING VENTILATION AND ODOR CONTROL**

PROJECT NO: **450881**

PROJECT TITLE: **SMITH STREET – TAR VAULT REMEDIATION**

CLIENT: **HONEYWELL**

				APPROVALS		
Issue	**Date**	**Pages**	**Issue Description**	**Prepared**	**Checked**	**Approved**
0	2/5/19	5	Issued For Construction	JMO	MMC/ADS	CFB

☒ Entire Specification Issued this Revision

☐ Revised Pages Only Issued this Revision

SPECIFICATION ISSUED FOR:

☐ In-house Review ☒ Bid

☐ Client Review/Approval ☐ Construction

☐ Information Only ☐ *Other*

PART 1 GENERAL

1.1 DESCRIPTION

A. The Work specified in this Section consists of all labor, equipment, tools, materials, services, supervision and incidentals necessary to provide and implement ventilation and odor control during remediation of the Tar Vault. Work in this Section includes, but is not limited to: selection, installation, and maintenance of ventilation blowers, controls, flexible ducts, atmospheric monitoring equipment, and vapor phase odor control units.

1.2 PERFORMANCE REQUIREMENTS

A. The Subcontractor shall comply with all applicable Federal, State and Local codes, ordinances, regulations, statutes and standards.

B. The Subcontractor is to obtain and operate within all applicable Local, State, and Federal permits and requirements necessary to implement the proposed Tar Vault remediation. Any and all civil, criminal, and monetary penalties associated with non-compliance in any regard shall be the responsibility of the Subcontractor.

C. The Subcontractor shall provide all labor, equipment, tools, materials, services, supervision and incidentals necessary to meet the requirements specified herein.

1.3 REFERENCES

A. New York State Department of Environmental Conservation (NYSDEC) DER-10 "Technical Guidance for Site Investigation and Remediation: Appendix 1A – New York State Department of Health Generic Community Air Monitoring Plan (CAMP).

1.4 SUBMITTALS

A. Vapor / Odor Management Plan. Submit a Vapor / Odor Management Plan, detailing the Subcontractors approach for ventilating the tar vault and preventing the intrusion of vapors and odors into the building. Include:

1. A description of the proposed approach for providing ventilation and odor control.
2. A proposed layout of all equipment, including blowers, duct work, discharge points, vapor phase odor control units, and related structures.
3. A description of all equipment to be provided, including shop drawings demonstrating compliance with the requirements of this specification.

1.5 QUALITY CONTROL / QUALITY ASSURANCE

A. It is the responsibility of the Subcontractor to ensure all air quality parameters are met and odors are controlled, for both worker protection and community protection, as described below:

1. Subcontractor shall monitor the air in the work zone and compare to applicable worker-based health standards.
2. Parsons shall monitor the air in the building and adjacent community in accordance with the New York State Generic Community Air Monitoring Plan (CAMP). Odor shall be monitored so no odors are negatively affecting the adjacent community.

B. All provided equipment shall be designed and manufactured in accordance with all applicable requirements of the latest editions of standards published by the following agencies and authorities, and shall be fully functional and fit for service:

1. Air Movement and Control Association (AMCA)
2. American National Standards Institute (ANSI)
3. American Society of Testing and Materials (ASTM)
4. American Society of Mechanical Engineers (ASME)
5. International Electrical Commission (IEC)
6. National Electric Code (NEC)
7. Institute of Electrical & Electronic Engineers (IEEE), including but not limited to IEEE 446 – Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Operations
8. National Electrical Manufacturer's Association (NEMA), including but not limited to NEMA MG 1- Motors and Generators.
9. NFPA 30: Flammable and Combustible Liquids Code
10. NFPA 70: National Electric Code
11. OSHA (Occupational Safety and Health Administration) Standard 29 CFR Part 1910, including but not limited to Subpart O for equipment guarding.
12. Underwriter's Laboratories, Inc (UL)
13. Other standards as described in Specification 011000

1.6 PROJECT AND SITE CONDITIONS

A. The Subcontractor shall carefully examine the site to determine the full extent, nature and location of work required to conform to the Contract Drawings and Specifications. The Subcontractor shall bring any inaccuracies or discrepancies between the Contract Drawings and Specifications to the Engineer's attention in order to clarify the exact nature of the Work to be performed.

PART 2 PRODUCTS

2.1 VENTILATION EQUIPMENT

A. Ventilation Equipment

1. Ventilation equipment (blowers) shall be sized to provide required airflow capacity taking into consideration approximate static pressure of flexible ducts and other appurtenances, and not use the free air capacity of the blower(s).
2. All fans and blowers shall be AMCA "A" spark resistant construction, UL-listed with explosion proof motors.
3. Ducts shall be statically conductive non-sparking ducting.

B. Odor Control Equipment

1. Odor control equipment will include a vapor phase carbon vessel consisting of air purification activated carbon that is effective for the removal of VOC compounds from air discharges. The vessel will be sized with an air flow capacity compatible with the ventilation system discharge described above.
2. The carbon adsorption vessel shall include the applicable inlets, outlets, lifting lugs, internal piping, carbon placement mesh, and bottom drain.
3. Activated carbon provided with the vessel will combine high surface area, along with fine pore structure and high hardness, as specified below.
4. The air purification carbon vessel will be supplied with a virgin activated carbon with the following properties:
   a. Size (U.S. sieve): 4 x 8
   b. CCL4 Number : 60 (min.)
   c. Apparent Density: 0.43 to 0.50 g/cc
   d. Moisture (percent): 3 (as packed)
   e. Hardness Number (min): 90
5. The air purification vessel will be equipped with a visual breakthrough indicator, installed at the 2/3 level of the carbon bed, consisting of an oxidizing granular material suspended within a transparent tube. When an oxidizable substance reaches the indicator, the granular material changes color, thus indicating carbon breakthrough at that point of the carbon bed.

C. Safety

1. All equipment shall be designed, manufactured, and provided with due regard to safety of operation, accessibility, and durability of parts, and shall comply with all applicable local, state, and federal safety regulations, including but not limited to the following:
   a. All rotating equipment shall be provided with appropriate guards in compliance with OSHA Standard 29 CFR Part 1910, Subpart O.

2. Provide temporary fencing or similar form of barrier to prevent access to the equipment by the public.
3. All equipment located within the tar vault or exposed to tar vault atmosphere shall be intrinsically safe for the location it is used in, and for specific use with a Class IIIA Combustible Liquid in accordance with NFPA 70.
4. Lifting Lugs and Anchor Systems. All equipment shall be provided with suitable lifting lugs and anchor systems. Subcontractor shall submit details of lifting lugs and anchor systems, and a lift plan, to Engineer for approval.

PART 3 EXECUTION

3.1 GENERAL

A. The Subcontractor shall furnish and install all required equipment in accordance with this specification, Specification 01100, and other Contract requirements, to provide for a complete and operable system.

B. The Subcontractor shall provide for ventilation in accordance with the approved Vapor / Odor Management Plan. For purposes of establishing a base scope, the Subcontractor shall provide outside air to the building's first floor, and draw air from the vault, such that ventilation air is positively pressurized from the first floor down into the vault and exhausted from the vault. For purposes of base bid, the Subcontractor shall assume the following:

1. Subcontractor shall supply 1,500 cfm of outdoor air to each of a minimum of two (2) open access hatches on the first floor. Subcontractor shall exhaust a baseline 2,000 cfm from the tar vault, plus 1,500 cfm for each open hatch. The minimum exhaust from the vault shall be 5,000 cfm, regardless of the number of hatches open. Airflow volume capacity shall take into consideration approximate duct static pressure of flexible ducts and not use the free air capacity of the fan(s). Subcontractor shall increase outside air and exhaust air by 1500 CFM per additional open hatch if more than two hatches are open at any given time. Outside supply air shall be provided to the rooms specific to where the hatches are open.
2. Subcontractor shall monitor differential pressure between the first floor and the vault. Subcontractor shall adjust airflow to maintain negative pressure in the vault relative to the first floor.

3.2 MONITORING

A. Monitoring shall be conducted in accordance with Section 1.5.

END OF SECTION

SPECIFICATION NO: **02070**

SPECIFICATION TITLE: **TAR REMOVAL**

PROJECT NO: **450881**

PROJECT TITLE: **SMITH STREET – TAR VAULT REMEDIATION**

CLIENT: **HONEYWELL**

				APPROVALS		
Issue	**Date**	**Pages**	**Issue Description**	**Prepared**	**Checked**	**Approved**
1	6/23/2019	6	Issued for Construction	CFB	JMO	CFB

☒ Entire Specification Issued this Revision

☐ Revised Pages Only Issued this Revision

SPECIFICATION ISSUED FOR:

☐ In-house Review ☒ Bid

☐ Client Review/Approval ☐ Construction

☐ Information Only ☐ *Other*

PART 1 GENERAL

1.1 DESCRIPTION

A. The Work specified in this Section consists of all labor, equipment, tools, materials, services, supervision and incidentals necessary to remove, handle, and transfer for transport tar vault contents, including but not limited to tar and tar-like material, overlying water not suitable for discharge to the NYC sewer system, and debris that is present in the vault.

1.2 PERFORMANCE REQUIREMENTS

A. The Subcontractor shall comply with all applicable Federal, State and Local codes, ordinances, regulations, statutes and standards.

B. The Subcontractor shall obtain and operate within all applicable Local, State, and Federal permits. Any and all civil, criminal, and monetary penalties associated with non-compliance in any regard shall be the responsibility of the Subcontractor.

C. The Subcontractor shall provide secondary containment and other measures as required to prevent release of tar vault contents to the environment.

D. The Subcontractor shall coordinate the work of this project to minimize disturbance of normal building activities in the Smith Street building, as well as adjacent businesses. This includes establishment of working hours to prevent disruption to building tenant operations. During all phases of Work, Subcontractor shall maintain building access which meets local fire codes.

E. The Subcontractor shall restrict location of equipment and supplies to the space designated by the Building Owner and the Engineer.

1.3 REFERENCES

A. New York State Department of Environmental Conservation: 6 NYCRR Part 375, Environmental Remediation Programs.

B. Title 29 Code of Federal Regulations, Part 1910 Occupational Safety and Health Standards – U.S. Department of Labor, OSHA

C. American Petroleum Institute (API) Standard 2015 Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks, 8th Edition, January 2018

D. American Petroleum Institute (API) Recommended Practice 2016 Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tank, May 2006

E. Energy Institute Model Code of Safe Practice, Part 16, Guidance on Tank Cleaning, 4th Edition, May 2017

F. Specification 01100 – Remediation Construction and OM&M Requirements – Procedure RES-CP-WPC-12 Waste Management Procedure.

1.4 DEFINITIONS

A. Definitions:

1. Atmospheric monitoring equipment – the oxygen monitors, combustible gas indicators and toxic substance analyzers used to sample and test atmospheric conditions.
2. Confined space – any tank or space that meets **all three** of the following requirements: is large enough and so configured that an employee can bodily enter and perform assigned work; has limited or restricted means for entry or exit; and is not designed or meant to be continuously occupied by employees.
3. Entrant – a qualified person who is authorized by the entry supervisor to enter a confined space.
4. Entry Permit – the written document provided by the (owner/operator and contractor) and issued by the entry supervisor that contains the site, potential hazard and work specific information to control and authorize entry into a confined space.
5. Flammable liquid – a liquid having a closed cup flash point below 100 F (38 C).
6. Flammable gas - see flammable vapor.
7. Flammable vapor – the gaseous phase of a substance that is liquid at normal atmospheric pressure and temperature and is capable of igniting and burning when mixed with oxygen in the proper proportions and subjected to an ignition source.
8. Hazardous atmosphere – an atmosphere that has the potential to expose entrants to the risk of death, incapacitation, impairment of ability to self-rescue, injury or acute illness from one or more causes.
9. Hot work -any work that has the potential to produce enough energy to be an ignition source in an area where the potential exists for a flammable vapor-in-air atmosphere.
10. Permit system – The employer's (owner/operator and Subcontractor) written procedure for preparing and issuing permits for entry, hot work and cold (safe) work.
11. Qualified person – a person designated by an employer as having the necessary training, education and competence to perform assigned vault cleaning and entry tasks.
12. Tar Vault Contents – Material to be removed from the vault during the cleaning process, including but not limited to tar, tar-like material, overlying water that is not suitable for discharge to the NYC sewer system, and debris that are present in the vault.
13. Standby person – a qualified person assigned to control and oversee supplied air operations.
14. Testing – The process by which the potential hazards that may be encountered when entering a permit required confined space are identified and evaluated.

15. Vapor and Gas freeing – the removal of flammable or toxic vapors and gases from the vault by displacement or the reduction of the percentage of vapors and gases in the vault atmosphere to a safe level by dilution with fresh air.
16. Ventilation – Providing fresh air inside the vault to maintain an atmosphere within acceptable permit limits and provide a required number of air changes per hour.
17. Worker – a qualified person working in and around the vault during vault cleaning.

1.5 SUBMITTALS

A. Tar Removal Plan. Subcontractor shall submit a detailed plan of the means and methods to be used to remove tar vault contents from the tar vault, for the Engineer review and approval. The plan shall be prepared in accordance with current industry standards, including but not limited to relevant or appropriate requirements described in the references listed in Section 1.3. At a minimum, the Tar Removal Plan shall include the following:
   1. Project mobilization
   2. Site set-up
   3. Removal procedure including specific labor and equipment
   4. Products to be used in the tar removal.
   5. Means and methods for transferring tar vault contents to transport vehicles.
   6. Decontamination procedures
   7. Site demobilization
   8. Protection of the public
   9. Project schedule
   10. Working days and hours

B. Project Waste / Material Management Plan. Subcontractor shall submit a detailed plan of the means and methods to be used to characterize, segregate, collect, temporarily store, transfer, transport, and dispose or manage all project-related materials and wastes, including but not limited to:
   1. Tar Vault Contents, tar, tar-like material, overlying water that is not suitable for discharge to the NYC sewer system, debris that are present in the vault.
   2. Construction water treatment plant residuals
   3. Decontamination materials
   4. Personal Protective Equipment (PPE)
   5. Trash and other debris

   The Waste / Material Management Plan shall comply with RES-CP-WPC-12 Waste Management Procedure, attached to Specification 01100.

C. Quality Control (QC) Plan. Per Section 1.6.

1.6 QUALITY CONTROL

A. Prior to start of Work, the Subcontractor shall submit a Quality Control (QC) Plan to the Engineer describing the Subcontractors proposed approach to document that vault contents have been removed to meet the requirements of this specification.

1.7 PROJECT AND SITE CONDITIONS

A. The Subcontractor shall carefully examine the site to determine the full extent, nature and location of work required to conform to the Contract Drawings and Specifications. The Subcontractor shall bring any inaccuracies or discrepancies between the Contract Drawings and Specifications to the Engineer's attention in order to clarify the exact nature of the Work to be performed.

PART 2 PRODUCTS

2.1 GENERAL

A. All products to be used for the vault cleaning shall be identified in the Tar Removal Plan described in Section 1.5.
B. The integrity of the vault is not known. The Subcontractor shall only use products that are non-hazardous and would not pose a risk if released to groundwater or the environment.

PART 3 EXECUTION

3.1 GENERAL

A. The Subcontractor shall conduct the tar vault cleanout in accordance with the submitted and accepted Tar Removal Plan. Deviations from the approved work plan must be approved by the Engineer.

3.2 PREPARATION

A. The Subcontractor shall provide and establish the following prior to commencing vault clean-out operations:
    1. Exclusion zones, decontamination zones, traffic control measures, and other personnel protective measures in accordance with Specifications 01100 and 01620.
    2. Protection of structure and surfaces in accordance with Specification 02010.
    3. Fire prevention program in accordance with Specification 02010.
    4. Provision for dewatering in accordance with Specification 02040.
    5. Ventilation in accordance with Specification 02050.
B. The Subcontractor shall establish infrastructure as required to complete the Work consistent with the Subcontractors means and methods and the Tar Removal Plan, including but not limited to:

1. Vault access / egress
2. Temporary lighting
3. Staging and material handling areas
4. Secondary containment and other provisions to prevent release of vault contents to the environment.

3.3 TAR REMOVAL

A. Subcontractor shall conduct removal operations so as to not damage the building structure or surfaces, including but not limited to the columns within the vault.

B. The Subcontractor shall remove the tar vault contents that are pumpable at ambient temperature, including tar, tar-like material, and overlying water that is not suitable for discharge to the NYC sewer system. The Subcontractor shall also remove debris that are present in the vault.

3.4 TRANSFER AND DISPOSAL OR MANAGEMENT OF VAULT CONTENTS AND OTHER PROJECT WASTES

A. Subcontractor shall segregate, temporarily store, transfer, and dispose or manage tar vault contents and other wastes in accordance with the approved Waste / Material Management Plan, and Specification 01100 – Remediation Construction and OM&M Requirements – Procedure RES-CP-WPC-12 Waste Management Procedure.

3.5 FINAL INSPECTION

A. Confirmation of removal shall be in accordance with Section 1.6.

END OF SECTION

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

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December 2009

APPENDIX D

COMMUNITY AIR MONITORING PLAN (CAMP)

APPENDIX D

COMMUNITY AIR MONITORING PLAN

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June 2019

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

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