DRAFT
Soil Removal Report
Building 2
Former Volvo Construction Equipment Facility
2169 Hendersonville Rd
Asheville, North Carolina
H&H Job No. PPA-040

January 13, 2012

Hart & Hickman

2923 South Tryon Street
Suite 100
Charlotte, NC 28203
704-586-0007

3334 Hillsborough Street
Raleigh, NC 27607
919-847-4241

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Soil Removal Report
Building 2
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Asheville, North Carolina

1.0 Introduction

Hart & Hickman, PC (H&H) has prepared this Soil Removal Report to document the excavation of petroleum-impacted soil located below Building 2 (formerly referred to as the Assembly Building) at the former Volvo Construction Equipment (VCE) Facility (Site) located in Asheville, North Carolina. The objective of the activities was to remove soil impacted with concentrations of total petroleum hydrocarbons-diesel range organics (TPHd) and/or oil & grease (O&G) above North Carolina Department of Environment and Natural Resources (DENR) action levels of 40 mg/kg for TPHd and 250 mg/kg for O&G, or as much soil as practical without impacting the structural integrity of the building.

The soil removal activities began at the Site on November 28, 2011 and were completed on January 11, 2012. A brief description of background information is provided in Section 2.0, and the soil removal activities are described in Section 3.0.

2.0 Background Information

2.1 Site Description and Assembly Building Sump Pit Background

The Site is located at 2169 Hendersonville Road in Asheville, North Carolina. A Site Location Map is provided as Figure 1. The Site is comprised of six land parcels totaling approximately 65.21 acres and includes a 177,300 sf former Fabrication Building (aka Building 1), a 163,100 sf former Assembly Building (aka Building 2), a 30,700 sf metal building, and a 15,600 sf office building. A site plan is included as Figure 2.

The facility was constructed in the mid to late 1970s and was initially used by Clark Equipment Company for the manufacture of tow motors and forklifts. VCE (formerly VME Americas) subsequently used the facility for the manufacture of large construction equipment. The facility was shut down in 2010. In fall 2011, Buncombe County purchased the Site, and Linamar subsequently began to occupy the site. Linamar is currently upfitting the Site for future manufacturing activities. Building 2 where the soil removal activities were performed is not currently occupied.

Based upon historical facility drawings, former sump pits were located in both of the main site buildings. In the Assembly Building, the sump pits were associated with an assembly line which used a “Towveyer” track system to move equipment around the facility. Portions of the steel Towveyor tracks are visible in the floor today and were encountered during the soil removal activities. The former sump pits were either removed or closed in place and covered with concrete to match the surrounding building floor. In some cases, the outline edges of the pits and patched concrete where the pits were located were visible prior to soil removal activities and are still visible in some areas in the floor of the building (where they were not removed during RA activities).

2.2 Summary of Previous Sump Pit Area Assessments

2.2.1 Initial Sump Pit Assessment

In June 2011, H&H conducted Phase II Environmental Site Assessment (ESA) soil and ground water sampling at the Site. In part, the results of the Phase II ESA activities indicated the presence of TPHd and O&G above DENR action levels in the area of three former sump pits located in Building 2. Concentrations of TPHd and O&G were detected in soil samples collected from HH-3, HH-4, and HH-10. For ease of reference, the former sump pit near previous boring HH-10 has been termed Sump Pit A, the former sump pit near previous boring HH-4 has been termed Sump Pit B, and the former sump pit near previous boring HH-3 has been termed Sump Pit C. Sump Pit A is located in the central portion of the Assembly Building (Figure 3A), and Sump Pits B and C are located in the southern portion of the building (Figure 3B). Based upon facility drawings and field measurements made during RA activities, the dimensions of Sump Pit A were approximately 10 ft by 20 ft, the dimensions of Sump Pit B were approximately 10 ft by 25 ft, and the dimensions of Sump Pit C were approximately 10 ft by 20 ft.

2.2.2 Additional Sump Pit Assessment

H&H conducted additional sampling activities in association with the sump pits in August and September 2011. The purpose of the sampling was to evaluate the lateral and vertical extent of soil impacts above DENR action levels. The assessment activities and results are documented in the September 29, 2011 *Sump Pit Soil Assessment Report* prepared by H&H.

<u>Sump Pit Characteristics</u>

During the additional sampling activities, borings were advanced in the approximate center of Sumps Pits A, B, and C in the locations shown in Figures 3A and 3B. After advancing through the surface concrete which was approximately 6 to 8 inches thick, the former sump pits were

found to be filled with a gravel and/or sand mixture. Concrete was encountered at approximately 2 to 3 ft below ground surface (bgs) in each of these three sump pits, and the concrete at the base of the pits could not be penetrated using direct push technology (DPT) for soil sample collection. During soil removal activities, it was apparent that the sump pits were filled with gravel, sand, and/or concrete and the bases of the former sump pits were determined to be approximately 2 ft thick.

The presence of additional sump pits in the area of Sump Pits B and C were suspected based evidence of concrete floor patching, and the presence of additional sump pits was confirmed during the soil assessment and soil removal activities. During the soil sampling activities, additional apparent former sump pits were identified east and north of Sump Pit C. The locations of these additional former sump pits were confirmed during the soil removal activities and are shown in Figure 3B. The dimensions of the former sump pit east of Sump Pit C were approximately 5 ft by 15 ft, and the dimensions of the former sump pit north of Sump Pit C (referred to as Sump Pit E) were approximately 16 ft by 37 ft.

A boring was placed within Sump Pit E as part of the sump pit assessment activities. After penetrating the surface concrete, approximately 5 ft of gravel and sand were encountered followed by concrete. Again, the lower concrete could not be penetrated using DPT for soil sample collection.

During soil removal activities, it was confirmed that the previously closed sump pits were filled with gravel, sand, and/or concrete, and the thickness of the concrete bases of the pits were determined to be approximately 2 ft thick.

Sump Pit Soil Delineation

The results of analyses of soil samples collected from the area of Sump Pit A prior to the soil removal activities indicated that soil impacts above DENR action levels were limited to an area approximately 15 ft by 30 ft (450 sf) and appeared to extend to a depth of approximately 15 ft bgs in the vicinity of the former sump pit. The highest levels of soil impact were detected in

shallow soil on the north side of the former sump pit where TPHd was detected at 15,000 mg/kg, and O&G was detected at 51,800 mg/kg. Pre-excavation Sump Pit A soil sample locations and compound concentrations are shown in Figure 3A.

The results of analyses of soil samples collected from the area of Sump Pits B and C prior to the soil removal activities indicated that soil impacts above DENR action levels encompassed the areas near and between Sump Pits B and C and included the area of the Towveyor tracks between the sump pits. Based on the pre-RA sample data, the dimensions of the impacted soil were estimated to be approximately 75 ft by 60 ft (4,500 sf) and extending to variable depths ranging from less than 5 ft along the perimeter of the soil impact area to greater than 20 ft near Sump Pit C. The highest levels of soil impact were detected in shallow soils in the immediate area of Sump Pit B, Sump Pit C, and the Towveyor tracks. Pre-excavation Sump Pit B and C soil sample locations and compound concentrations are shown in Figure 3B.

3.0 Removal Action Implementation

Soil removal activities were conducted at the site from November 28, 2011 through January 11, 2012. As described in Section 1.0, the purpose of the RA was to remove soil impacted with concentrations of TPHd and/or O&G above DENR actions levels of 40 mg/kg for TPHd and 250 mg/kg for O&G, or as much soil as is technically practical without impacting the structural integrity of the building.

Two areas of soil were targeted for excavation. The excavation areas were located in the vicinity of Sump Pit A (hereafter referred to as the northern excavation area) and in the areas near and between Sump Pits B and C (hereafter referred to as the southern excavation area). Implementation of the RA activities is described in the following sections.

A work plan entitled *Removal Action Work Plan and Request for Proposal* dated November 3, 2011 was submitted to the DENR Brownfields Section which described the proposed soil removal activities. DENR approved the work plan in an e-mail dated November 3. As part of the work plan, DENR approved leaving impacted soil in place beneath roof support columns located within the lateral extents of southern excavation as necessary to protect the structural integrity of the building. As part of the agreement to leave impacted soil in place, the work plan included placing a liner over the backfilled southern excavation before replacing the concrete to segregate the impacted soil from future manufacturing activities to be conducted in the building. In their approval letter, DENR requested that the liner installation be certified by a Professional Engineer and that the locations of the post-excavation soil samples with concentrations above DENR action levels be adequately documented for future reference and inclusion on the Brownfields plat.

3.1 Project Organization

H&H was contracted by Linamar to perform environmental oversight services for the soil removal activities, and Buncombe County contracted EVO Corporation (EVO) of Winston-

Salem, NC to perform the soil removal constructions activities. H&H and EVO mobilized to the site and began project activities on November 28, 2011. The activities generally progressed as summarized below:

1. Daily safety briefings were conducted by H&H and EVO.
2. Underground utilities were located and marked at the site prior to beginning subsurface activities. NC One Call Center was notified of the subsurface activities and a ULOCO ticket number was obtained prior to beginning excavation activities. A private utility locator contracted by EVO identified and/or verified the locations of subsurface utility lines at the Site.
3. The lateral extents of each planned excavation were marked prior to beginning excavation activities.
4. Excavation, transport, and concrete removal equipment were delivered to the site as needed.
5. Removal and off-site recycling of concrete flooring and concrete associated with the former sump pits were conducted as described in Section 3.2.
6. Removal and off-site recycling of the steel Towveyor tracks and rebar segregated from the concrete floor overlying the excavation areas were conducted as described in Section 3.2.
7. Soil excavation, confirmation sampling, and disposal activities were conducted as described in Section 3.3.
8. Excavation backfilling was conducted as described in Section 3.4.
9. A liner was installed over the excavation area as described in Section 3.5.
10. Concrete floor replacement was completed as described in Section 3.6.
11. Site cleanup, equipment removal, and demobilization were also completed.

Photographic documentation of the project activities is included in Appendix A.

3.2 Concrete Floor and Sump Pit Removal

Prior to beginning soil excavation, concrete flooring over the two excavation areas was saw cut, removed, and temporarily stockpiled on-site. A breaker was utilized to break the concrete into manageable sizes. The concrete floor in the building was observed to range from approximately 6 to 8 inches thick. It was evident that the concrete floor was reinforced with wire mesh, except in the areas of the former sump pits where concrete was reinforced with rebar. The extents of the two excavation areas (identified as the northern and southern excavation areas) are shown in Figures 4A and 4B, respectively.

Remnants of the three former sump pits described in Section 2.2.2 (Sump Pits A, B, and C) were identified during removal of the concrete flooring over the excavation areas. The presence of three additional suspected former sump pits (Section 2.2.2) was also confirmed during removal of the floor over the southern excavation area. The larger of these two former sump pits, which is located adjacent to and north of Sump Pit C, was termed Sump Pit E and is shown in Figure 4B. In addition, a previously unidentified former sump pit was located near the center of the southern excavation area and was termed Sump Pit D (Figure 4B).

The former sump pits were observed to extend to depths ranging from approximately 3 ft to 4 ft beneath the surface of the building floor, except Sump Pit E which extended to approximately 6 ft beneath the surface of the building floor, and the pits appeared to be constructed of 8-inch thick concrete walls and 2-ft thick concrete bases. Each of the pits was filled with sand, concrete, and/or gravel fill materials. When practicable, the fill material was removed from the pits, temporarily stockpiled on-site, and subsequently used as excavation backfill material. There was no evidence that the sand and gravel materials removed from the previously closed sumps were impacted.

A breaker or excavator bucket was utilized to break the sump pit concrete into manageable sizes, and the concrete was temporarily stockpiled on-site with the concrete removed from the building

floor. Concrete from the floor and sump pits was subsequently transported off-site for recycling at Vulcan Materials in Enka, NC.

Rebar and wire mesh reinforcement were segregated to the extent practical from the concrete during removal of the floor and temporarily stockpiled on-site. The steel Towveyor tracks (Section 2.1) were also segregated from the concrete during removal of the floor, cut into manageable lengths, and temporarily stockpiled on-site. These steel materials were subsequently transported off-site to Mountain Metals Recycling in Asheville, NC.

During concrete floor removal activities, a group of fluid lines located beneath the slab along the eastern edge of the southern excavation area (Figure 4B) were cut. A review of the Assembly Building plumbing floor plan (M-3) that was provided to H&H indicates that the lines were used to supply a hose reel assembly for a fueling station and contained anti-freeze and engine, diesel, and hydraulic oils. There were no significant fluids observed in the lines. The lines were abandoned by filling the ends of each pipe with General Purpose insulating foam and capping the ends of the lines with Fernco caps. In addition, two roof drain lines located beneath the roof support column footers were identified at the edge of the footer and at the outer perimeter of the southern excavation. Following completion of backfilling activities, these lines were repaired so that they function as originally intended.

In addition, during removal of the concrete floor and former sump pits, three voids in small sump pits were identified beneath the edge of the eastern perimeter of the southern excavation area that extended outside of the perimeter of the excavation. It appears that these voids were created when the backfilled gravel or sand within these small pits slumped into the excavations when their western sides were removed. The locations of these voids are shown in Figure 4B. During backfilling activities, these voids were filled with a flowable fill material.

3.3 Soil Excavation Activities

3.3.1 Soil Removal

Excavation maps depicting the extents of the northern and southern excavation areas are included as Figures 4A and 4B, respectively. Soil excavation activities were commenced following removal of the building floor, former sump pits, and Towveyor tracks located over the planned extents of the two excavation areas (Section 3.2). Soil was removed from each of the excavation areas using an excavator. As excavation activities progressed, removed soils were screened by H&H personnel using a photoionization detector (PID) and evaluated by sensory methods as a qualitative means of determining when soil impacted above DENR action levels had been adequately removed from the excavation areas.

Soil was generally removed from each of the excavation areas to the originally planned lateral excavation extents. Soils in the northern excavation area were removed from an approximately 35 ft x 15 ft area (500 sf) to a depth of 14 ft bgs (Figure 4A).

Soils in the southern excavation area were removed from an approximately 5,000 sf area. As noted previously, two support columns were located within the final lateral extents of the southern excavation. To not undermine these columns, soils were left in place beneath each column in a "benched pyramid" manner (see photographs in Appendix A and Figure 4B) outward from the column footer to the bottom depth of the soil excavation in the column's vicinity. As a result, the depth of soil removal in the southern excavation extended from shallow depths of approximately 2 ft bgs adjacent to the support column footer and to a maximum depth of 22 ft bgs in the deepest portion of the excavation. Note that soil removal in the southern excavation was conducted to variable depths in different areas of the excavation (based on field screening and observations that were used to guide the removal of soil impacted above DENR action levels while minimizing removal of clean soil). The southern excavation was primarily to

a depth of 10 ft. The extents of excavation (including the approximate location of divisions between variable excavation depths) are depicted in Figure 4B.

3.3.2 Sampling

After soil removal in a targeted area was completed and field screening indicated impacted soil was adequately removed, H&H personnel collected confirmation samples from the excavation sidewalls and bases to demonstrate that impacted soil had been adequately removed. Sidewall confirmation samples were collected along perimeter sidewalls of the excavation areas at approximately 30 ft intervals and at least one sample was collected from each major perimeter sidewall of the excavation. The sidewall sample identifications have an "SW" prefix.

In addition, two internal sidewall samples were collected from the western portion of the excavation where a small area of soil impact extended to a depth of 22 ft adjacent to other soil impact areas that extended to a depth of 10 ft. These internal sidewall samples were identified as ISW-1 and ISW-2.

Confirmation samples were also collected from the excavation bases at a rate of approximately one sample per 1,000 sf of excavation base area. Note that base sample locations in the southern excavation were distributed so that at least one sample was collected from an area with a bottom depth distinct from an adjacent area.

At DENR's request, samples were also collected from the soils that were left in place beneath the support columns. Because the excavation near the northern support column (identified as S4) was adjacent to the northwestern side of the excavation only two samples (S4-1 and S4-2) were collected from soil left in place below this column. Four samples (S3-1 through S3-4) were collected from each side of soil left in place below the southern column (identified as S3). Excavation sample locations are shown in Figures 4A and 4B.

The excavation samples were submitted to Pace Analytical Services, Inc. of Asheville, NC under standard sampling and chain-of-custody protocols. The samples were analyzed on a rush basis for TPHd by EPA Method 8015M and O&G by EPA Method 9071B.

Analytical results of the confirmation samples indicate that there were no detections of TPHd or O&G in any of the samples collected from the northern excavation area. Analytical results of confirmation samples collected from the southern excavation indicate that there were no detections of TPHd or O&G above the DENR action levels in any of the confirmation samples, with the following exceptions:

- Concentrations of TPHd (1,420 mg/kg) and O&G (6,150 mg/kg) were detected in sidewall sample SW-11 which was collected along a portion of the excavation's southern sidewall. Additional soil removal was subsequently conducted in the area of the sample to remove the impacted soil. There were no concentrations of TPHd or O&G detected above laboratory detection limits in the sidewall sample (SW-11A) collected from the newly exposed sidewall following the additional excavation.

- A concentration of TPHd was detected in sidewall sample SW-9 (41.3 mg/kg) which was collected from the western sidewall of the excavation. Because the detection was only slightly above the DENR action level of 40 mg/kg, DENR approved a request to leave soil in the vicinity of the sample location in place in an e-mail dated December 21, 2011. The location of this sample is indicated in blue in Figure 4B.

Six soil samples were also collected from soils left in place beneath the roof support columns located in the southern excavation area. The results of analyses of these samples indicate that of the six samples, only two of the samples (S3-1 from the northern side of roof support column S3) and S4-2 (from the southern side of roof support column S4) indicated concentrations of TPHg and O&G above the DENR action levels. In sample S3-1 (8 ft), TPHd was detected at a concentration of 19,300 mg/kg and O&G was detected at a concentration of 14,100 mg/kg. In sample S4-2 (6 ft), TPHd was detected at a concentration of 629 mg/kg and O&G was detected

at a concentration of 3,140 mg/kg. These two sample locations are identified in blue in Figure 4B.

A summary of excavation sample analytical data is presented in Table 1. Laboratory analytical data reports are included in Appendix B.

3.3.3 Soil Disposal

During soil removal activities, soils removed from the excavations were either live-loaded directly into trucks for off-site transport or were temporarily stockpiled in the building prior to load-out when no trucks were readily available. Approximately 2,783 tons of soil were excavated from both areas and transported to Domermuth Environmental Services, Inc. of Knoxville, TN for disposal as a non-hazardous waste. Waste disposal manifests are included in Appendix C.

3.4 Excavation Backfilling

After confirming that soils impacted above DENR action levels had been removed to the extent practical, the excavation areas were backfilled. Backfill soil was imported from three off-site sources that included Oldcastle Minerals of Fletcher, NC, Vulcan Materials of Enka, NC, and Hendrick Industries of Weaverville, NC. A soil sample was collected from each source and submitted to Prism Laboratories of Charlotte, NC for analysis of TPH – gasoline range organics (TPHg) and TPHd by EPA Method 8015C, O&G by EPA Method 9071B, volatile organic compound (VOCs) by EPA Method 8260B, semi-volatile organic compounds (SVOCs) by EPA Method 8270D, and HSL metals by EPA 6010C. Analytical results of the backfill samples indicated that there were no detections of TPH, O&G, VOCs, or SVOCs above laboratory detection limits. Concentrations of several metals were detected in each of the backfill samples at concentrations within typical background concentration ranges for the metals in North Carolina soils as cited in Dragun & Chekiri's *Elements in North American Soil* (2nd edition). A copy of the backfill sample analytical results are provided in Appendix E.

The backfill was placed in horizontal lifts of 6 to 12-inch thicknesses across the base of each excavation and compacted using a bulldozer, pad drum vibratory roller compactor, and/or mini-roller. Field density testing of the backfilled area was conducted by ECS of Asheville at a minimum rate of six tests per 1,000 cy of backfill. Compaction continued until each area met the compaction criteria of 95% standard Proctor. The soil compaction test results are provided in Appendix D.

Approximately six inches of gravel base material was placed and compacted from the top of the backfill soils to approximately eight inches below the bottom of the concrete flooring around the perimeter of the excavation areas.

3.5 Liner Installation

Upon completion of backfilling, a high density polyethylene (HDPE) 16-mil liner was installed above the backfill across the entirety of the southern excavation area. A Barrier-Bac VB-350 liner was used and was installed per the manufacturer's specifications. Seams in the liner were overlapped a minimum of six inches and taped in accordance with the manufacturer's guidelines using tape supplied by the manufacturer. Penetrations in the liner (i.e., the roof support column footers) were sealed with "Block Out Seaming Methods" specified in the manufacturer guidelines. In addition, the liner was lapped up along the edge of the sides of the excavation as per the manufacturer's specifications.

The certification below is signed by Ms. Christie Zawtocki, PE of Hart & Hickman, PC, who inspected the liner during and following completion of its installation above the southern excavation. Ms Zawtocki's certification for the liner inspection installation is provided below.

I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the installation of the liner and my final inspection of the installed liner, the liner was installed and is functioning as specified.

_____

Christie Zawtocki, PE Date

Hart & Hickman, PC

3.6 Concrete Floor Replacement

Replacement of the concrete floor was completed to the original specifications for the floor (i.e., 8-inch thickness, 4,000 psi, minimum 5.5 sack, maximum 6.5 gallons per cy, and maximum 3-inch slump). Rebar was installed on 12-inch centers along the perimeter of the concrete replacement areas and was "doweled" into the existing concrete. Note that doweling did not cause penetration of the liner because the penetrations were located above the edge of the liner. Rebar was installed on 18-inch centers throughout the other concrete replacement areas.

4.0 Conclusions

The following summarizes the major components and results of the RA activities conducted at the former Volvo Construction Equipment Facility site:

- A total of approximately 2,783 tons of impacted soil were removed from two excavation areas located inside Building 2 at the Site. Final confirmation sidewall and base samples collected from the excavation areas indicate that soils with concentrations of TPHd and O&G above DENR action levels were successfully removed from the targeted areas to the extent practical without impacting the structural integrity of the building.

- A small amount of soil with concentrations of TPHd and O&G above DENR action levels were left in place beneath two roof support columns located within the lateral extent of the southern excavation. The soil that was left in place was tiered outward from the column footer to the bottom depth of the soil excavation in the column's vicinity to prevent soil collapse that would potentially undermine the column footer.

- An HDPE liner was installed across the southern excavation area above the top of the backfill prior to replacement of the concrete floor to ensure that the small amount of impacted soil remaining near the roof support columns would be segregated from future manufacturing activities in the building.

The objective of the soil removal was to remove soil impacted with concentrations of TPHd and/or O&G above DENR action levels of 40 mg/kg for TPHd and 250 mg/kg for O&G in the sump pits in Building 2, or as much soil as technically practical. Through implementation of the activities described in this report, this objective has been achieved.

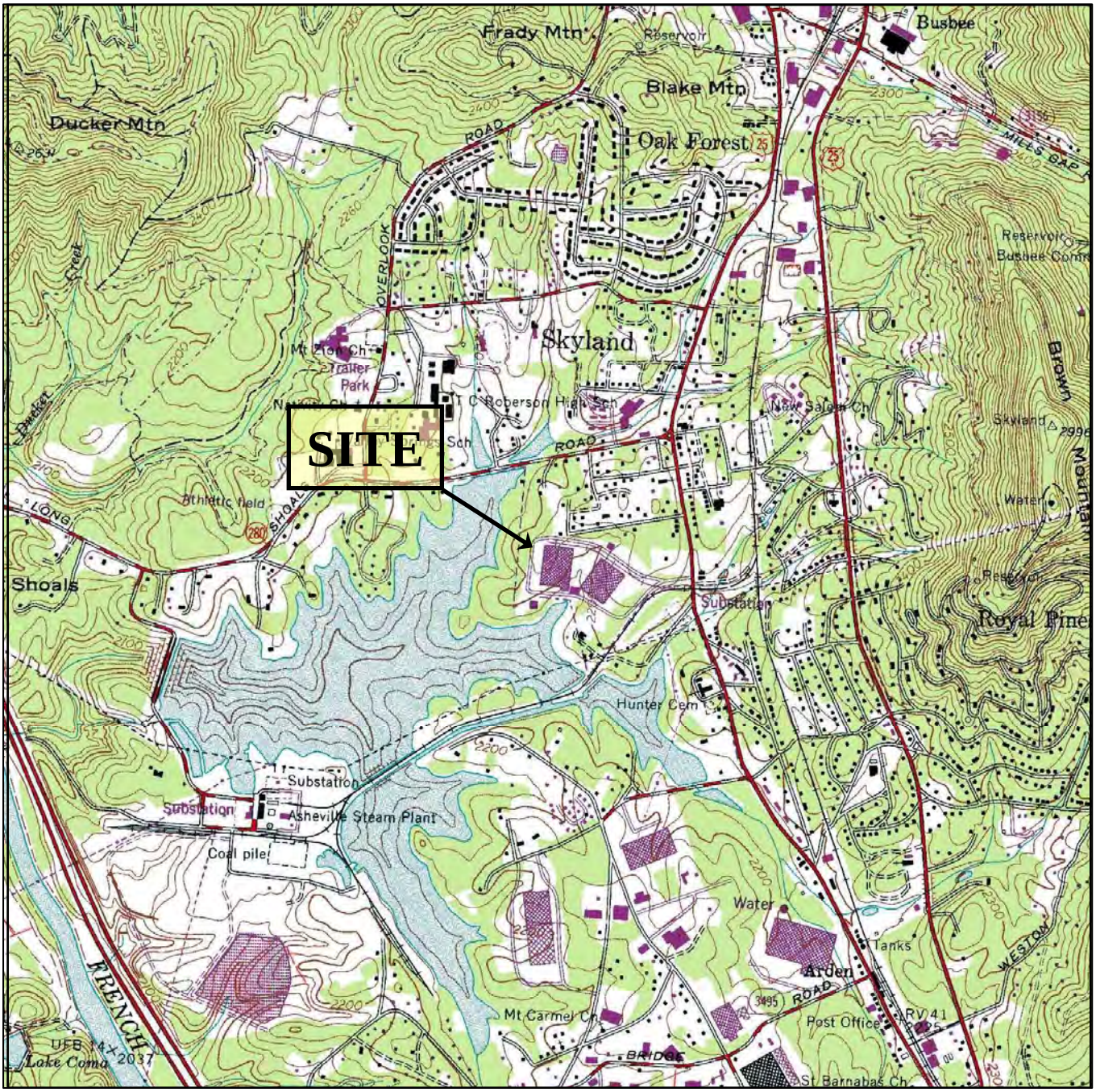
Table 1 (Page 1 of 1)
Summary of Post-Excavation Soil Sample Analytical Data
Former Volvo Construction Equipment Facility
Asheville, North Carolina
H&H Job No. PPA-040

Location	Northern Excavation Sample Data					
Sample ID Depth (ft bgs) Sample Date Units	A-SW-1 7 12/09/11 (mg/kg)	A-SW-2 7 12/09/11 (mg/kg)	A-SW-3 7 12/09/11 (mg/kg)	A-SW-4 7 12/09/11 (mg/kg)	A-B-1 14 12/09/11 (mg/kg)	**NCDENR Action Levels[1] (mg/kg)**
TPH-DRO (8015C)	<6.1	<6.0	<6.7	<5.9	<6.4	**40**
Oil & Grease (9071B)	<85.5	<84.4	<94.0	<83.0	<89.3	**250**

Location	Southern Excavation Sidewall Sample Data															Southern Excavation Base Sample Data						
Sample ID Depth (ft bgs) Sample Date Units	SW-1 6 12/07/11 (mg/kg)	SW-2 6 12/07/11 (mg/kg)	SW-3 6 12/07/11 (mg/kg)	SW-4 11 12/09/11 (mg/kg)	SW-5 11 12/09/11 (mg/kg)	SW-6 12 12/12/11 (mg/kg)	SW-7 12 12/12/11 (mg/kg)	SW-8 6 12/13/11 (mg/kg)	SW-9 6 12/13/11 (mg/kg)	SW-10 5 12/13/11 (mg/kg)	SW-11 6 12/14/11 (mg/kg)	SW-11A 6 12/20/11 (mg/kg)	SW-12 12 12/14/11 (mg/kg)	ISW-1 16 12/14/11 (mg/kg)	ISW-2 16 12/14/11 (mg/kg)	B-1 12 12/09/11 (mg/kg)	B-2 16 12/09/11 (mg/kg)	B-3 23 12/12/11 (mg/kg)	B-4 10 12/13/11 (mg/kg)	B-5 10 12/13/11 (mg/kg)	B-6 22 12/14/11 (mg/kg)	**NCDENR Action Levels[1] (mg/kg)**
TPH-DRO (8015C)	<5.3	<5.8	<6.0	<5.4	<5.9	8.1	13.8	<6.2	**41.3**	6.9	**1,420**	<5.6	<5.6	<5.6	<5.6	<5.8	<5.4	<5.6	<5.3	8.9	<5.70	**40**
Oil & Grease (9071B)	<74.8	<82.4	<84.2	<76.3	<82.8	<76.5	<95.0	<87.3	110	<93.1	**6,150**	<79.0	<78.6	<79.2	<77.2	<81.8	<76.0	<78.4	<74.6	<84.4	<57.7	**250**

Location	Support Column Slope Soil Sample Data						
Sample ID Depth (ft bgs) Sample Date Units	S3-1 8 12/13/11 (mg/kg)	S3-2 8 12/12/11 (mg/kg)	S3-3 8 12/13/11 (mg/kg)	S3-4 8 12/13/11 (mg/kg)	S4-1 6 12/09/11 (mg/kg)	S4-2 6 12/09/11 (mg/kg)	**NCDENR Action Levels[1] (mg/kg)**
TPH-DRO (8015C)	**19,300**	31.3	10.5	<5.7	27.1	**629**	**40**
Oil & Grease (9071B)	**14,100**	<80.6	<92.8	<79.9	<82.1	**3,140**	**250**

Notes:
1) from DENR UST Section Guidelines for Investigation and Remediation of Contamination from Non-UST Petroleum Releases (July 1, 2007)
Bold concentration exceeds action level. Sample collected from soil that remains in place.
Bold concentration exceeds action level. Sample collected from soil that was subsequently removed by additional excavation.
Analytical method number follows parameter in parentheses
TPH = Total Petroleum Hydrocarbons; DRO = Diesel Range Organics
mg/kg = milligrams per kilogram



N

APPROXIMATE

0 2000 4000

SCALE IN FEET

U.S.G.S. QUADRANGLE MAP

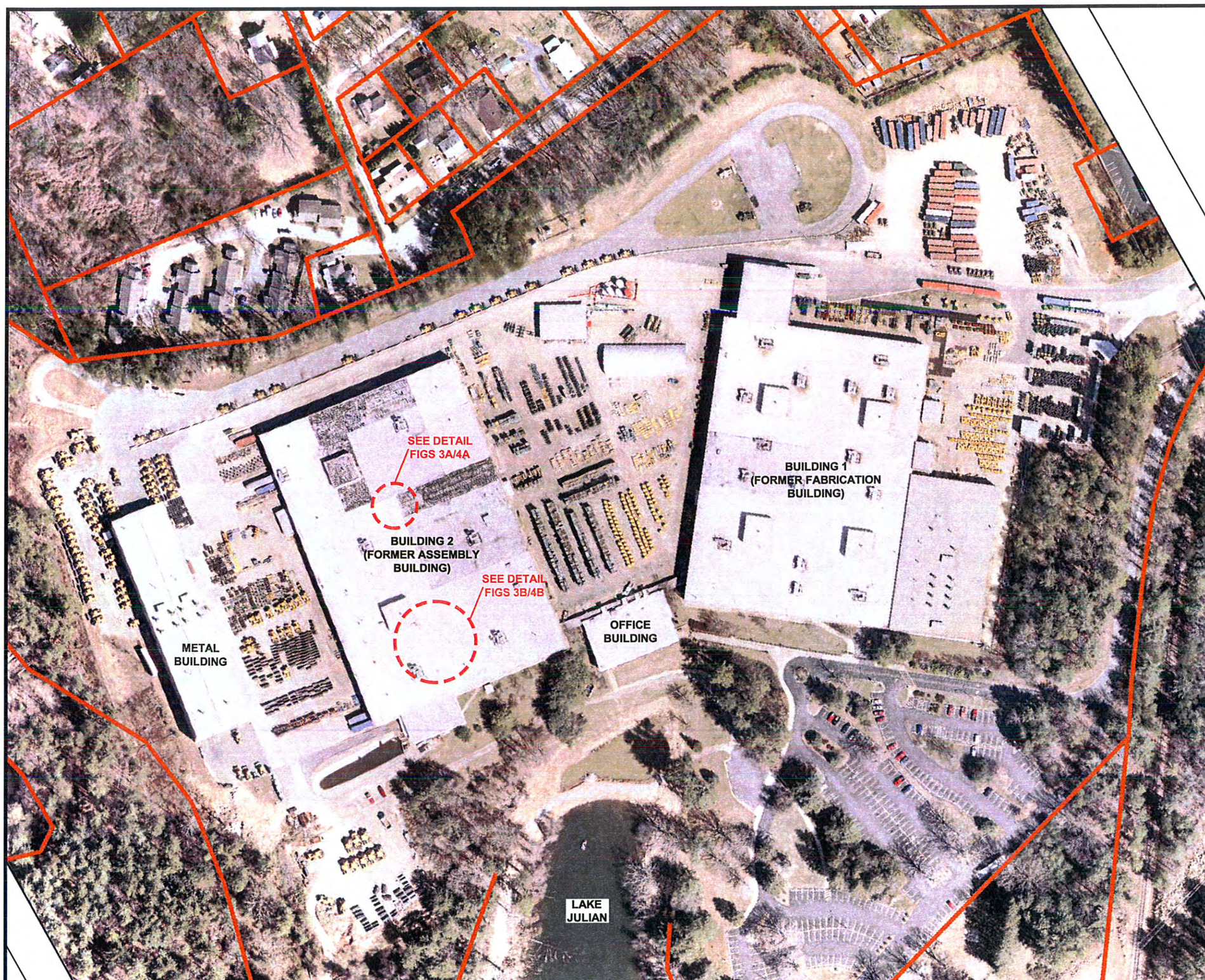
Skyland, NC 1965
Revised 1991

QUADRANGLE
7.5 MINUTE SERIES (TOPOGRAPHIC)

TITLE	SITE LOCATION MAP
PROJECT	FOMER VOLVO CONSTRUCTION EQUIPMENT FACILITY ASHEVILLE, NC

Hart & Hickman
A Professional Corporation
2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007 (p) 704-586-0373 (f)

DATE:	06-28-11	REVISION NO:	0
JOB NO:	PPA-040	FIGURE:	1



N

APPROXIMATE
0 150 300
SCALE IN FEET

TITLE
SITE MAP

PROJECT
FORMER VOLVO CONSTRUCTION EQUIPMENT
ASHEVILLE, NORTH CAROLINA

Hart & Hickman
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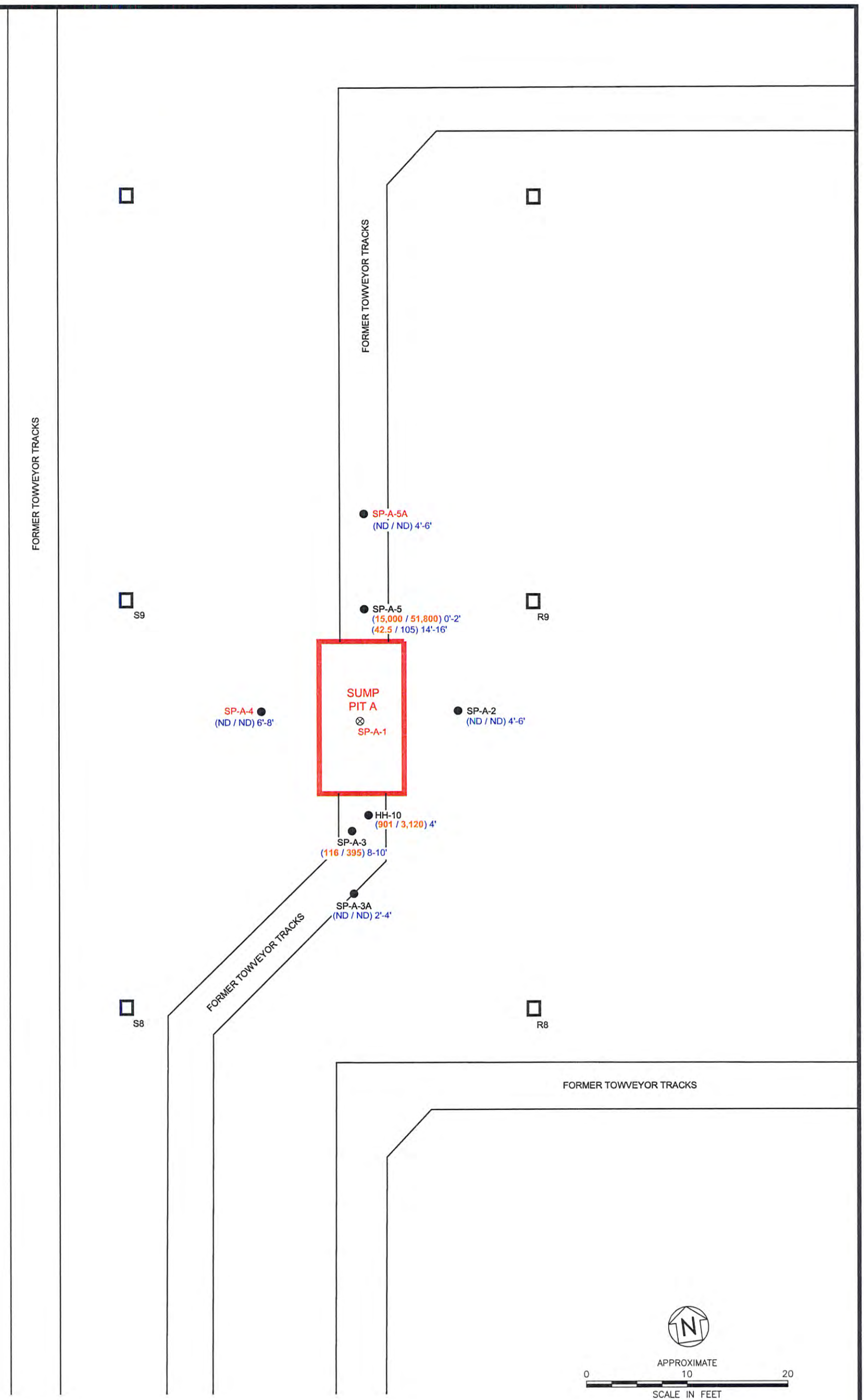
DATE: 8–19–11	REVISION NO. 0
JOB NO. PPA–040	FIGURE NO. 2

S:\AAA-Master Projects\Parker Poe Adams (PPA)\PPA-040 volvo equipment\Soil Removal\Soil Removal Report\Fig 2 Site Map.dwg, fig 2 site map, 1/13/2012 1:57:10 PM, nfoster



LEGEND

- ● SOIL BORING
- ⊗ ATTEMPTED BORING WHERE DPT REFUSAL ENCOUNTERED ABOVE SOIL INTERFACE
- □ T2 BUILDING SUPPORT COLUMN LABELED WITH GRID NODE FROM FOUNDATION PLAN
- (39,700 / 56.9) 6'-8' / (56.9 / 114) 14'-16' TPH-DRO / O&G CONCENTRATIONS (MG/KG) AND SAMPLE DEPTH (BOLD ORANGE INDICATES CONCENTRATION ABOVE DENR ACTION LEVEL)

NOTES
1. MAP BASED ON ASSEMBLY BUILDING FOUNDATION PLAN DRAWING AND FIELD OBSERVATIONS/MEASUREMENTS
2. ND = NOT DETECTED
3. SCREENING CRITERIA: TPH-DRO = 50 MG/KG, O&G = 250 MG/KG

TITLE
PRE-EXCAVATION SUMP PIT A
SOIL ASSESSMENT MAP

PROJECT
FORMER VOLVO CONSTRUCTION EQUIPMENT
ASHEVILLE, NORTH CAROLINA

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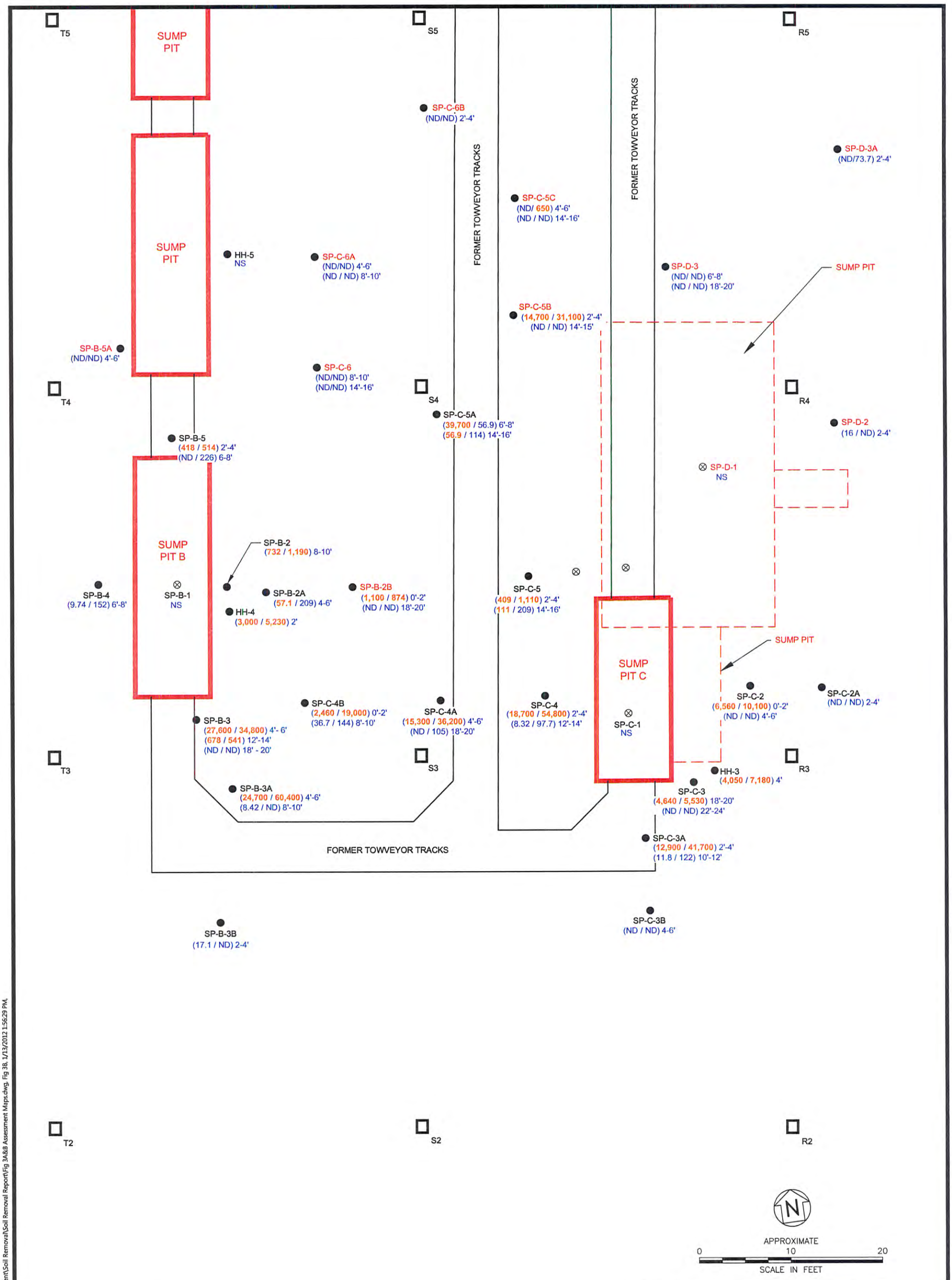
DATE: 9–7–11	REVISION NO. 0
JOB NO. PPA–040	FIGURE NO. 3A

S:\AAA-Master Projects\Parker Poe Adams (PPA)\PPA-040 volvo equipment\Soil Removal\Soil Removal Report\Fig 3A&B Assessment Maps.dwg, Fig 3A, 1/13/2012 1:56:54 PM,



LEGEND

- ● SOIL BORING
- ⊗ ATTEMPTED BORING WHERE DPT REFUSAL ENCOUNTERED ABOVE SOIL INTERFACE
- □ T2 BUILDING SUPPORT COLUMN LABELED WITH GRID NODE FROM FOUNDATION PLAN
- (39,700 / 56.9) 6'-8' / (56.9 / 114) 14'-16' TPH-DRO / O&G CONCENTRATIONS (MG/KG) AND SAMPLE DEPTH (BOLD ORANGE INDICATES CONCENTRATION ABOVE DENR ACTION LEVEL)

NOTES
1. MAP BASED ON ASSEMBLY BUILDING FOUNDATION PLAN DRAWING AND FIELD OBSERVATIONS / MEASUREMENTS
2. NS= NOT SAMPLED; ND = NOT DETECTED

TITLE
PRE-EXCAVATION SUMP PIT B & C
SOIL ASSESSMENT MAP

PROJECT
FORMER VOLVO CONSTRUCTION EQUIPMENT
ASHEVILLE, NORTH CAROLINA

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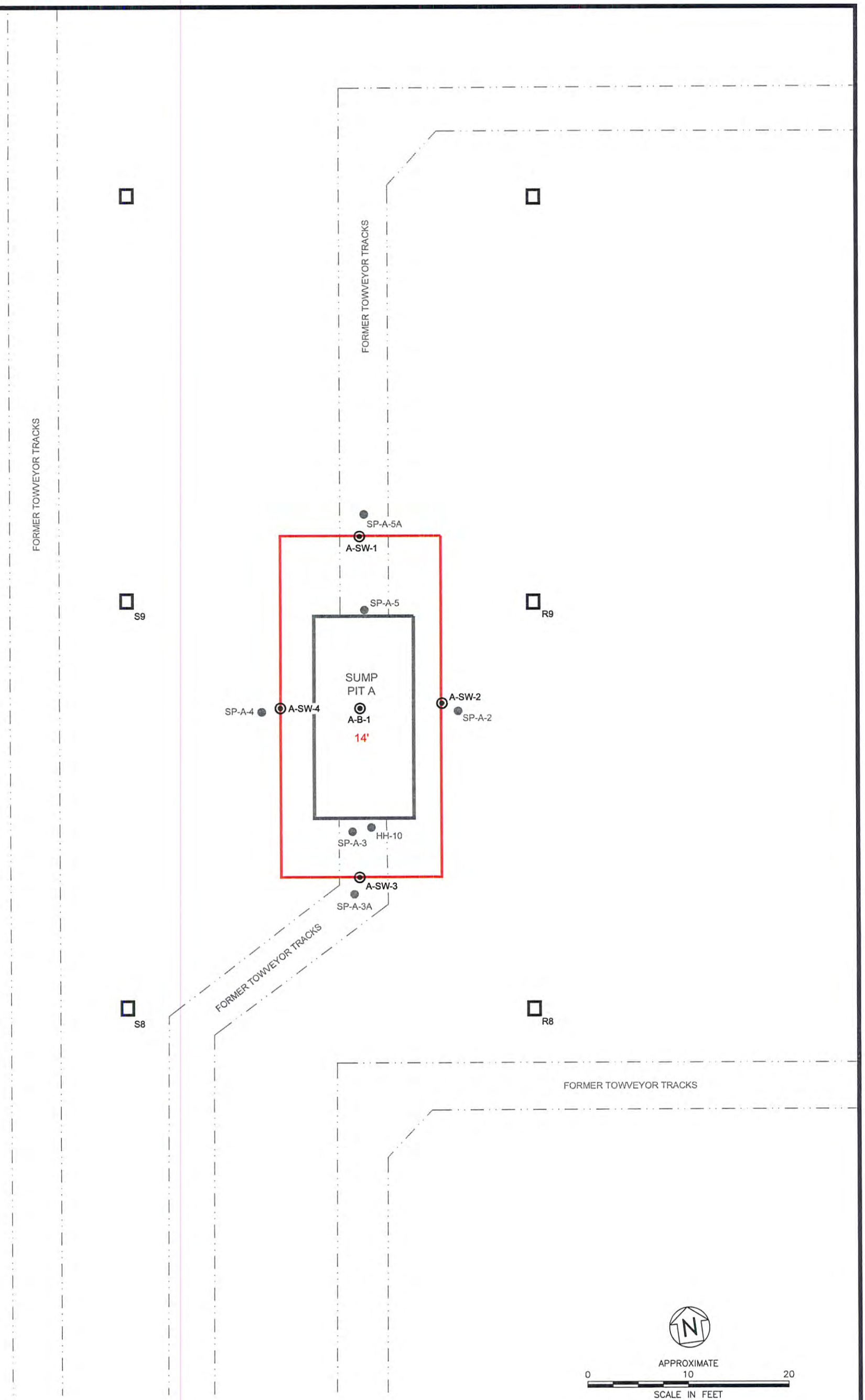
DATE: 9–22–11	REVISION NO. 0
JOB NO. PPA–040	FIGURE NO. 3B

S:\AAA-Master Projects\Parker Poe Adams (PPA)\PPA-040 volvo equipment\Soil Removal\Soil Removal Report\Fig 3A&B Assessment Maps.dwg, Fig 3B, 1/13/2012 1:56:29 PM,



LEGEND

- EXCAVATION CONFIRMATION SAMPLE LOCATION
- OUTER EXTENT OF EXCAVATION
- 10' DEPTH OF EXCAVATION BASE (DEPTHS VARY ACROSS SIDEWALLS LOCATED WITHIN THE OUTER EXTENTS OF EXCAVATION)
- PRE-EXCAVATION ASSESSMENT SOIL BORING
- BUILDING SUPPORT COLUMN LABELED WITH GRID NODE FROM FOUNDATION PLAN
- FORMER TOWVEYOR TRACK
- EXTENT OF FORMER SUMP PIT

NOTE
MAP BASED ON ASSEMBLY BUILDING FOUNDATION PLAN DRAWING AND FIELD OBSERVATIONS / MEASUREMENTS

TITLE
NORTHERN EXCAVATION MAP

PROJECT
FORMER VOLVO CONSTRUCTION EQUIPMENT
ASHEVILLE, NORTH CAROLINA

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DATE: 01-05-12	REVISION NO. 0
JOB NO. PPA-040	FIGURE NO. 4A

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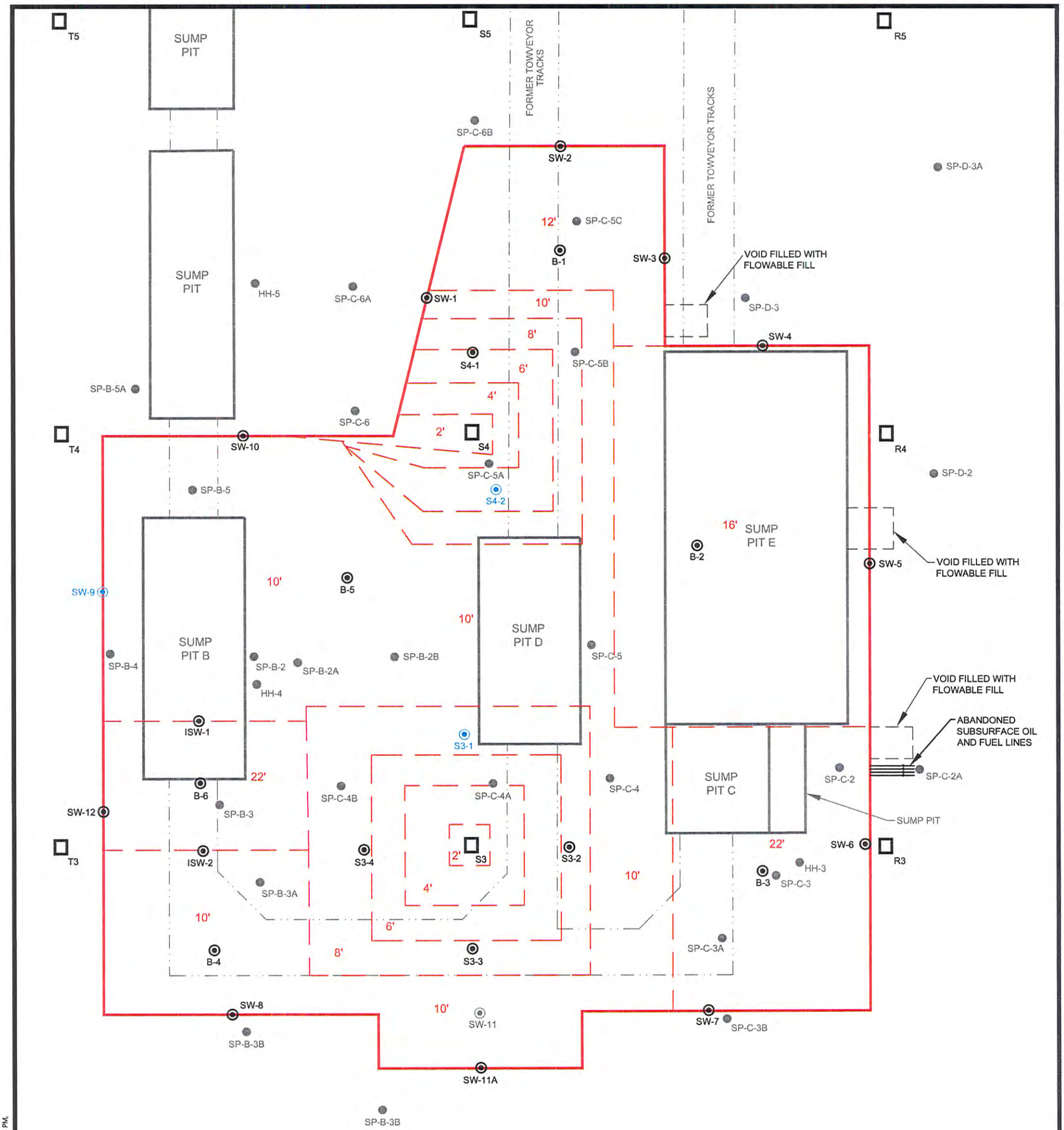

LEGEND

- EXCAVATION CONFIRMATION SAMPLE LOCATION
- EXCAVATION CONFIRMATION SAMPLE ABOVE ACTION LEVEL LEFT IN PLACE
- OUTER EXTENT OF EXCAVATION
- SIDEWALL LOCATED WITHIN THE OUTER EXTENTS OF EXCAVATION
- 10' DEPTH OF EXCAVATION BASE (DEPTHS VARY ACROSS SIDEWALLS LOCATED WITHIN THE OUTER EXTENTS OF EXCAVATION)
- PRE-EXCAVATION ASSESSMENT SOIL BORING
- T2 BUILDING SUPPORT COLUMN LABELED WITH GRID NODE FROM FOUNDATION PLAN
- FORMER TOWVEYOR TRACK
- EXTENT OF FORMER SUMP PIT

NOTE
MAP BASED ON ASSEMBLY BUILDING FOUNDATION PLAN DRAWING AND FIELD OBSERVATIONS / MEASUREMENTS

TITLE
SOUTHERN EXCAVATION MAP

PROJECT
FORMER VOLVO CONSTRUCTION EQUIPMENT
ASHEVILLE, NORTH CAROLINA

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Charlotte, North Carolina 28203
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DATE: 01-05-12	REVISION NO. 0
JOB NO. PPA-040	FIGURE NO. 4B

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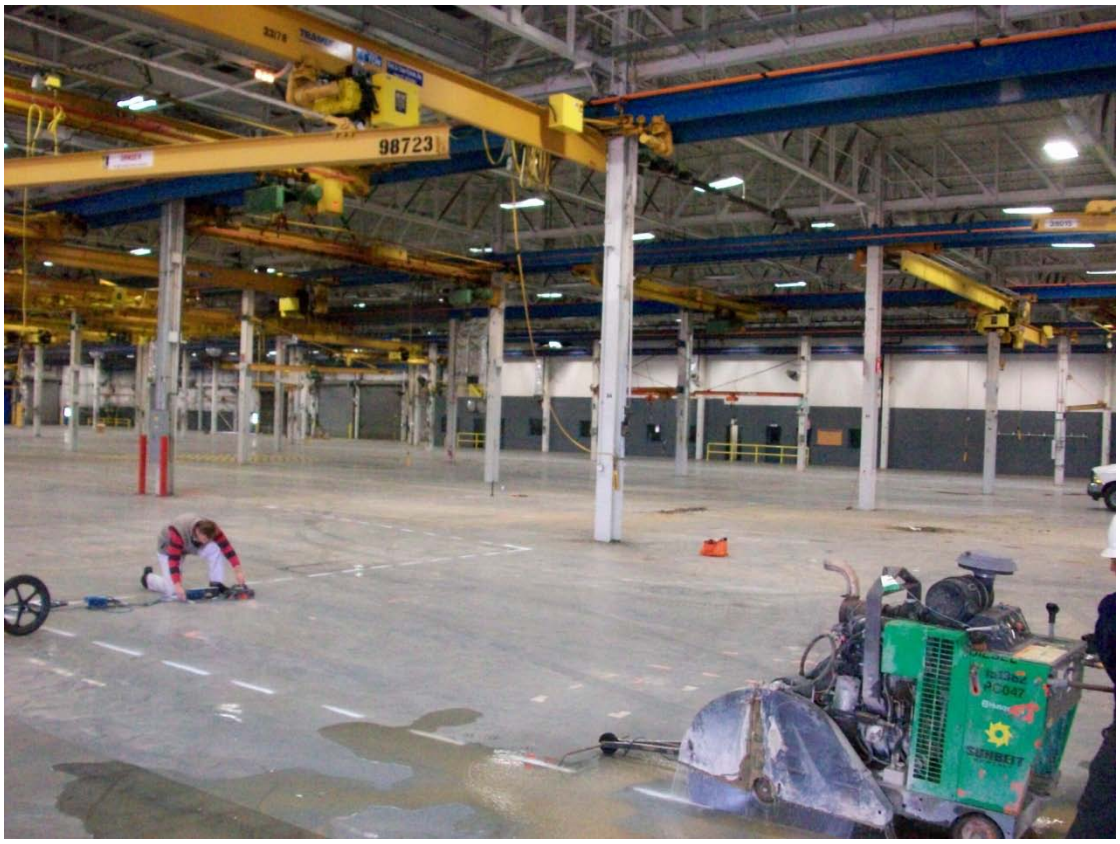
Appendix A

Photographs



Photograph 1: Saw cutting of southern excavation area.

Photograph 2: Concrete floor removal

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Photograph 3: Concrete removal (northern excavation)

Photograph 4: Sump pit concrete breaking

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Photograph 5: Sump Pit E following removal of fill material from the pit

Photograph 6: Sump Pit E removal (fill material removed from sump pit shown stockpiled in background)

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Photograph 7: View of southern excavation area during concrete and sump pit removal

Photograph 8: Concrete and sump pit removal

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Photograph 9: Towveyor track at edge of excavation

Photograph 10: Center of Towveyor tracks (tow chain groove)

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Photograph 11: Southern excavation (view to NW)

Photograph 12: Southern excavation (view to S)

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Photograph 13: Southern excavation (view to NE)

Photograph 14: Southern excavation (view to S)

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Photograph 15: Southern excavation, backfill in background (view to NE)

Photograph 16: Southern excavation backfilling

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Photograph 17: Southern excavation backfilling (view to NE)

Photograph 18: Southern excavation backfilling

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Photograph 19: Southern excavation backfilling

Photograph 20: Southern excavation backfilling

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Photograph 21: Northern excavation backfilling

Photograph 22: Northern excavation backfilling

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Photograph 23: Gravel base installation above southern excavation backfill

Photograph 24: HDPE liner installation

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Photograph 25: HDPE liner installation

Photograph 26: HDPE liner and rebar installation

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Photograph 27: Flowable fill installation into voids

Photograph 28: Pipe abandonment

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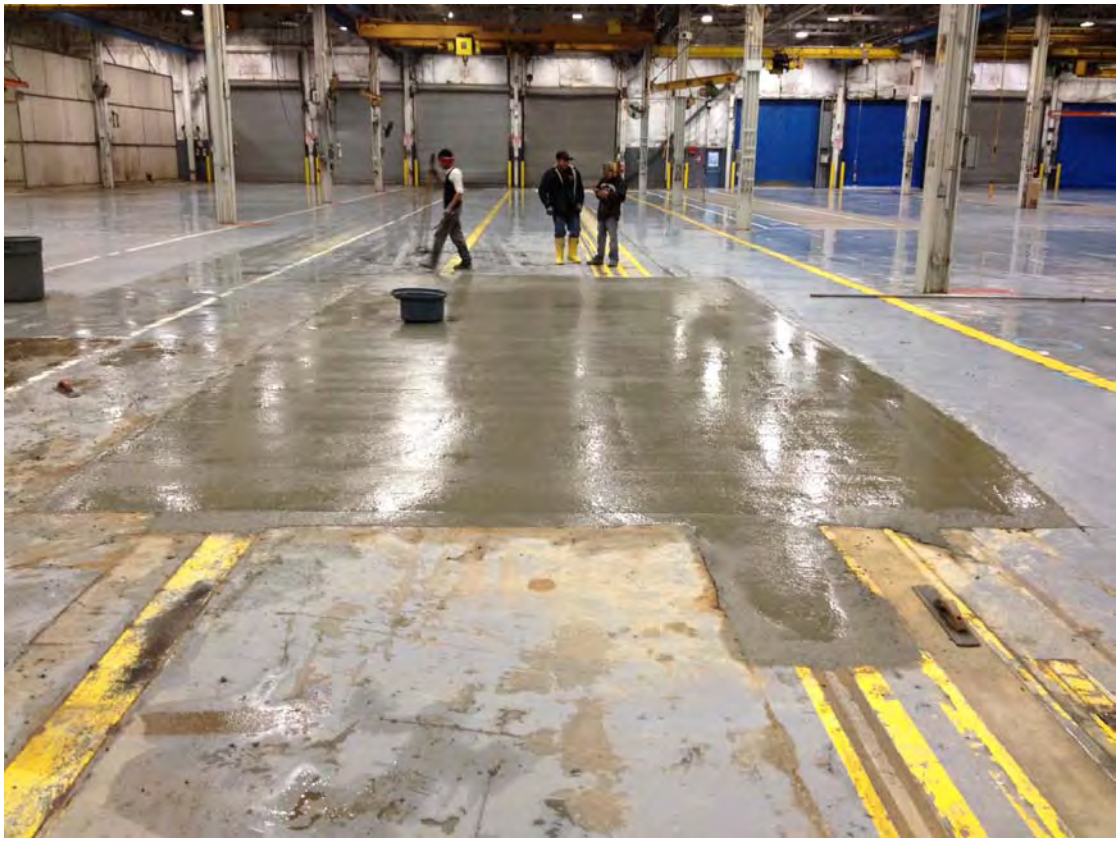
Photograph 29: Concrete installation



Photograph 30: Concrete installation

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Appendix B

Post-Excavation Laboratory Analytical Data Reports

Appendix C

Waste Management Documents

Appendix D

Compaction Tests

Appendix E

Soil Backfill Laboratory Analytical Data Reports