

PERMANENT SOLUTION STATEMENT WITH CONDITIONS SUBMITTAL

**EASTERN ETCHING & MANUFACTURING, INC.
35 LOWER GRAPE STREET
CHICOPEE, MA 01020**

Prepared for:

**EASTERN ETCHING & MANUFACTURING, INC.
35 LOWER GRAPE STREET
CHICOPEE, MA 01020**

Prepared by:

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OHI PROJECT #15-1700

Report Date:

JANUARY 14, 2020

January 14, 2020

David Slowick
Massachusetts DEP – BWSC-WERO
436 Dwight Street
Springfield, MA 01103

**Re: Permanent Solution with Conditions Statement
35 Lower Grape Street
Chicopee, MA 01020**

**DEP RTN: #1-20060
OHI Project #15-1700**

Dear Mr. Slowick:

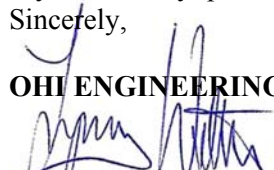
OHI Engineering Inc. (OHI) was retained by Eastern Etching & Manufacturing, Inc. (EEM) to provide Licensed Site Professional (LSP) services relative to material identified by the City of Chicopee in Tailrace #1 and Flood Gate Control Structure (FGCS) #1 located at 35 Lower Grape Street in Chicopee, MA (**Figures 1, 2, and 3**). OHI conducted an investigation which included historical research, multiple rounds of soil and groundwater sampling outside the limits of the tailrace, sampling of the Tailrace #1 fill material, and a ground-penetrating radar (GPR) survey. A video survey of the inside of Tailrace #1 was also attempted. That assessment identified petroleum, Lead, and Antimony in soil at levels above Reportable Concentrations (RCs) and Method 1 S-1 standards, but below Method 1 S-2/3 standards.

The area outside of Tailrace #1 and FGCS #1 that has been impacted by petroleum, Lead and Antimony is hereafter referred to as the "Site". These compounds have not impacted groundwater at the Site above Method 1 standards. Review of the soil results and groundwater contours indicates that the soil issues outside of Tailrace #1 and the material inside Tailrace #1 are not connected. Therefore, this Permanent Solution Statement with Conditions (PSWC) only addresses petroleum, Lead and Antimony impacts to soil at the Site. This PSWC does not address the material inside Tailrace #1 and FGCS #1 that are not owned by EEM, are not "in the environment" and are not "soil".

Method 1 Risk Characterization of the releases to soil at the Site supports a PSWC. Under current industrial use, the Site poses No Significant Risk (NSR), as defined in the Massachusetts Contingency Plan (310 CMR 40.0000). Under possible future residential use, a Notice of Activity and Use Limitation (AUL) is necessary to maintain a condition of NSR. This report has been prepared in accordance with requirements of the MCP.

If you have any questions or comments, please contact me.
Sincerely,

OHI ENGINEERING, INC.


Wm. Lyons Witten, PG, LSP
Regional Manager

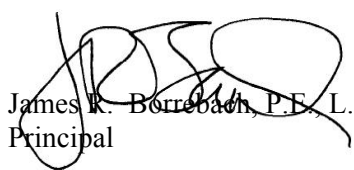

James R. Borrebaeck, P.E., L.S.P.
Principal

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1.0 INTRODUCTION

OHI Engineering Inc. (OHI) was retained by Eastern Etching & Manufacturing, Inc. (EEM) to provide Licensed Site Professional (LSP) services relative to fill material identified by the City of Chicopee in Tailrace #1 and Flood Gate Control Structure (FGCS) #1 located at 35 Lower Grape Street in Chicopee, MA (**Figures 1, 2, and 3**). OHI conducted an investigation which included historical research, multiple rounds of soil and groundwater sampling, sampling of the Tailrace #1 fill material, and a ground-penetrating radar (GPR) survey. A video survey of the inside of Tailrace #1 was also attempted.

As part of assessment activities, soil and groundwater sampling was conducted outside the limits of the tailrace. That assessment identified petroleum, Lead, and Antimony in soil at levels above Reportable Concentrations (RCs) and Method 1 S-1 standards, but below Method 1 S-2/3 standards.

In August 2016, EEM filed a Downgradient Property Status (DPS) submittal (OHI, 2016) with the Massachusetts Department of Environmental Protection (MassDEP) indicating:

- 1) The release of petroleum, Lead and Antimony to soil outside Tailrace #1;
- 2) The City and EEM sampling results of fill material within Tailrace #1 and FGCS #1 that contained metals and petroleum at concentrations above Method 1 standards and Chromium above the Upper Concentration Limit (UCL).
- 3) The tailrace is a brick structure with walls and a floor, the fill material was determined to not be located “in the environment”.
- 4) Both structures are located under or adjacent to EEM buildings on EEM property, but both structures and the fill material located inside those structures are not owned by EEM.

MassDEP rejected the DPS submittal, indicating additional investigation was needed. EEM conducted additional assessment activities to better define the type and limits of the releases. MassDEP did concur that the fill material within Tailrace #1 does not constitute a release to the environment.

The area outside of Tailrace #1 and FGCS #1 that has been impacted by petroleum, Lead and Antimony is hereafter referred to as the “Site”. These compounds have not impacted groundwater at the Site above Method 1 standards. Review of the soil results and groundwater contours indicates that the soil issues outside of Tailrace #1 and the material inside Tailrace #1 are not connected. Therefore, this Permanent Solution Statement with Conditions (PSWC) only addresses petroleum, Lead and Antimony impacts to soil at the Site. This PSWC does not address the material inside Tailrace #1 and FGCS #1 that are not owned by EEM, are not “in the environment” and are not “soil”.

Method 1 Risk Characterization of the releases to soil at the Site supports a Permanent Solution with Conditions (PSWC). Under current industrial use, the Site poses No Significant Risk (NSR), as defined in the Massachusetts Contingency Plan (310 CMR 40.0000). Under possible future residential use, a Notice of Activity and Use Limitation (AUL) is necessary to maintain a

condition of NSR. This report has been prepared in accordance with requirements of the MCP.

Several easements over EEM land are held by the City of Chicopee and the U.S. Army Corps of Engineers (USACE) as explained in more detail below.

1.1 Release Discovery & Notification

In 2016, OHI evaluated the releases of OHM at the Site by comparing soil and groundwater laboratory results with the Reportable Concentrations (RCs) for the analytes. This resulted in the following findings, discussed in detail in **Sections 4.0 and 5.0** below:

- Petroleum and Lead were detected above the RCs in two soil borings (SB-2 and SB-3) completed in proximity to the tailrace at depths below measured groundwater elevation.
- Lead was detected in groundwater above the RC in an upgradient monitoring well (OHI-7).

The detection of petroleum and lead represented a 120-day reportable condition at the Site, and the release was reported to MassDEP on **August 23, 2016**, resulting in the issuance of Release Tracking Number (RTN) 1-20060. OHI opined that the release qualified for Downgradient Property Status (DPS), and submitted a *DPS Submittal* for the RTN on August 29, 2016 after issuance of the RTN.

In a letter dated **September 23, 2016**, MassDEP indicated disagreement with the DPS opinion, invalidated the *DPS Submittal*, and requested additional assessment at the Site.

A *Phase I Initial Site Investigation & Tier Classification Submittal* (OHI, **August 11, 2017**) was submitted prior to the one year anniversary of release notification.

2.0 CONTACT INFORMATION

The entity conducting response actions for the Site is:

Eastern Etching & Manufacturing, Inc. 800-445-2526
Mike Cocco, Operations Manager
35 Lower Grape Street
Chicopee, MA 01020

The LSP of Record is:

Lyons Witten, PG, LSP 413-835-0780
OHI Engineering, Inc. lwitten@ohiengineering.com
110 Pulpit Hill Road
Amherst, MA 01002-4013

3.0 GENERAL DESCRIPTION

3.1 *Site Location and Setting*

The Site comprises only that portion of the EEM property located at 35 Lower Grape Street, Chicopee, Hampden County, Massachusetts that has been impacted with petroleum, Lead and Antimony, which comprises the western portions of the alley between EEM buildings, concurrent with a sewer easement.

The EEM property contains approximately 1.226 acres of land. A USGS topographical site locus is provided as **Figure 1**. An aerial photo of the Site and vicinity is provided as **Figure 2**. A copy of the Assessors' map is provided in **Figure 3** showing the approximate property boundaries. Photographs of the Site and response actions are included in **Appendix A**.

Geographic coordinates for the Site are:

Longitude: 72°36'17.68" West

Latitude: 42°08'58.97" North

3.2 *Topography*

According to Google Earth, the property at 35 Lower Grape Street lies at an elevation of approximately 64-68 feet above Mean Sea Level (MSL) based on the National Geodetic Vertical Datum of 1929 (NGVD 29). Most of the Site and topography in the vicinity of the Site slope from the Canal north and west toward the Chicopee River.

3.3 *Surface Water Drainage*

A dam east of the Site diverts a portion of the water in the Chicopee River into a Canal which was built in the 1800s. The Canal flows parallel to the Chicopee River, both flowing west. Industry located between the Canal and the Chicopee River used the water to create power. Six headrace and tailrace structures fed water for power to various industrial buildings in this section of Chicopee (**Figure 2**). Tailrace #1 is located under EEM property and a portion of the Site.

Surface water runs north and west over most of the paved surfaces at the Site and is collected in stormwater catch basins. One catch basin (CB-1) is located between the two EEM brick manufacturing buildings and drains directly into Tailrace #1 (see **Figure 5**), which runs south to north from the Canal to the Chicopee River. Remaining surface water flows to catch basins that are part of the City of Chicopee stormwater drainage system. The City owns a sewer easement that runs east to west through the middle of the EEM property crossing Tailrace #1, and a second stormwater system which the City of Chicopee operates in conjunction with the U.S. Army Corps of Engineers (USACE) that lies within an easement between the most northerly EEM buildings and the Chicopee River flood wall. Tailrace #1 discharges to the USACE stormwater system at Flood Gate Control Structure #1 (FGCS#1). These easements and Tailrace #1 are shown on **Figures 5 & 6**.

In 2016, the concrete walls of the Canal appeared in poor condition with multiple cracks near and just below the water line. These cracks were a likely source of water to recharge groundwater under the EEM Site, and that likely discharged to the toe drains and Tailrace #1. In late 2016, the Canal was emptied and many of the cracks in the Canal wall were sealed. Since that time, groundwater seepage across the ground surface at the southern end of EEM property has reduced significantly. EEM does not have any control over or responsibility for the condition of the Canal structure or the operation of the Canal.

3.4 Institutions, Water Supplies & Other Sensitive Receptors

The Site and surrounding neighborhood are serviced with public water and sewer by the City of Chicopee. No water supply wells are known to exist within ½ mile of the Site. The Holyoke Catholic High School is located approximately ½ mile south of the Site, in an upgradient direction (**Figure 4**). No other schools, hospitals, or daycare facilities are known to exist within ½ mile of the Site.

3.5 Priority Resources

Based on the MassDEP Priority Resource Maps for the Site vicinity, the Site is not located within a Zone II area, Zone A area, Interim Wellhead Protection Areas, critical habitat, wetland, high yield aquifer, public water source or a protected open space. The Site is located within a ½-mile of mapped estimated rare wetland wildlife habitat, several potential vernal pools, and the Chicopee River. The Site is located within the Chicopee River floodplain; however, it is protected by the Chicopee River flood wall. The northern half of the EEM property is listed as being in an “Other Flood Areas” region on the Flood Insurance Rate Map for this portion of Chicopee (25013C0213E). The MassDEP Phase I Assessment Priority Resource Map is attached as **Figure 4**.

3.6 Surrounding Land Uses

Properties in the immediate vicinity of the Site were visually examined from curbside. The Site is surrounded on three sides by commercial properties with associated parking facilities. The Site is surrounded as follows:

North – Chicopee River, with wooded land and scattered residential lots beyond.

East – former Ames Sword Co, now owned by EEM and rented to several industrial/commercial tenants.

South and West – Residential apartments and associated parking lots of the Ames Privilege Apartments complex, former A.G. Spaulding & Bros. Manufacturing complex, Chicopee River Canal beyond. South of the Chicopee River Canal is a mixed residential and commercial neighborhood.

4.0 SITE DESCRIPTION

EEM is an industrial manufacturing facility employing only adults in a restricted access setting and is owned by J.A. Realty Company of Springfield, Inc. EEM currently employs 45 full-time and one part-time employees.

4.1 Site History

The Site history was developed through interviews with the property owner, state and municipal officials, and reviews of records at municipal, county, and state agencies. According to the assessors' information, the EEM buildings were built between 1840 and 1980.

4.1.1 Owner/Operator and Operations History

J.A. Realty Company of Springfield, Inc., owner of the EEM property, purchased the property from the City of Chicopee by Order of the Board of Aldermen dated October 23, 1940. The property contained only one building (No. 11) at the time, according to the Order (**Appendix B**).

Sanborn Fire Insurance Rate Maps of the area for the years 1885, 1891, 1902, 1910, 1915, and 1950 were reviewed at the University of Massachusetts library system. The Sanborn maps make no mention of headraces or tailraces (**Appendix C**). A 1931 Associated Factory Mutual Fire Insurance Companies map #10660 of the Spaulding & Bros. factory was reviewed (**Appendix C**). A Factory Mutual Fire Insurance Companies survey plan #10661 of EEM by George Hughes dated March 28, 1968 was reviewed (**Appendix C**). US Army Corps of Engineers (USACE) design plans dated 1940 show the location of the flood wall that was constructed along the southern side of the Chicopee River on EEM property (USACE, 1940, **Sheet 11**, copy in **Appendix D**). USACE took an easement on land north of EEM's most northerly building in order to build and maintain the flood wall (shown on **Figure 5**). The following land use history was derived from the maps:

- 1885: The Sanborn map does not show the Site. It portrays a portion of the abutting property of the Ames Manufacturing Co. complex, located between the Canal and the Chicopee River.
- 1891: The Sanborn map does not show the Site. It portrays a portion of the abutting property of the Ames Manufacturing Co. complex, located between the Canal and the Chicopee River.
- 1902: This Sanborn map shows that Ames Manufacturing has been converted to several businesses, and the western EEM buildings are shown as No.8 "vacant" and No.11 "storage" closest to the J.C. Buckley Foundry. The eastern portion of the EEM property is shown as part of the Ames Sword Co. property.
- 1910: By this date, the entire former Ames Manufacturing property, including the western portions of the current EEM property are listed by Sanborn as occupied by the A.G. Spaulding & Bros. Manufacturing Co., manufacturers of sporting goods. Building No. 8 is listed as "leather & skate departments" with a boiler room at the western end, while building No. 11 is listed as "flask building". The eastern portion of the current EEM

- property was still part of Ames Sword Co.
- 1915: Ownership remained the same on this date as in 1910 map. Building No. 8 is listed as “rubber manufacturing & vulcanizing on the 1st [floor with] leather & skate dept. 2nd & 3rd [floors]”. Building No. 11 is still listed as “flask building”, while a lumber shed and a new four-story building No. 28 is listed as “rubber manufacturing, all floors”. Upgradient of building No.8 on the current Ames Privilege property is building No. 7 listed as having a “laboratory” on the first floor, with offices above. On the Ames Sword Co. property, [former] building No. 3 is listed as a “brass foundry”.
- 1931: This Associated Factory Mutual Fire Insurance Companies map indicates that only Building No. 28 (“golf club building”) remains on what will become EEM property, and implies that all of it is part of the Spaulding complex. Building No. 7, closer to the Canal, is listed as “Laboratory”. Other buildings in the vicinity are listed as “dry kiln”, “golf ball building”, “machine shop” (x2), “oil house”, casting house”, “sand blasting”, and “drop forge” (x2), among others.
- 1938: The “Flood of 1938” devastated Western Massachusetts, and Chicopee was impacted by the floodwaters. Six to eight feet of sediment were reportedly deposited on the EEM property during flooding, damaging most of the buildings. Archival photos taken during and after the flood are included in **Appendix A**.
- 1950: By this date, Spaulding was no longer manufacturing at this location, EEM is listed on the Sanborn map as a metalworking company and partial property lines around EEM are shown. Building No. 8 is no longer present, but a six-car garage is shown in place of a portion of the former structure. Building No. 11 has transformed from a small single story structure to a three story brick structure. Building No. 28 remains as a four-story structure. The flood wall along the Chicopee River is not shown, but should have been present by this date.
- 1968: This survey plan (Factory Mutual, 1968) details the dates of the additions of EEM buildings No. 11 (1915-1956) and No. 28 (1914-1950). This plan indicates the presence of five underground storage tanks: two 10,000-gallon hydrochloric acid tanks located east of No. 11, a 1,000-gal and a 4,000-gal tanks of Solvasol located south of No. 11 and just west of Tailrace #1; and, a 10,000-gal tank for fuel oil located partially under the north side of No. 28-A. Etching, a paint shop, spray booth, lithographing, punch presses, and machine shop are uses listed in various parts of the EEM buildings. Tailrace #1 is shown as a straight feature on this plan, and labeled as “raceway” and “not in use”. Tailrace #1 is shown to end at a “Lock” near the Chicopee River. The flood wall and storm drain system features are not illustrated on this plan.
- 1984: “Ames Mills” plan of land showing soil boring and sampling locations prepared by Haley & Aldrich (1984) for assessment work completed on the Ames property.
- 1998: AUL Plan of Land prepared for Ames (RTN #1-11854) (Hill, 1998).
- 2009: This preliminary “Plan of Land and Flood Controls and Dike Easement” by Heritage Surveys, Inc. shows the location of the concrete flood control wall within the ACE easement along the north and east sides of the EEM property (Heritage, 2009).
- 2012: This preliminary “Plan of Land” shows the location of the concrete flood control wall within the ACE easement along the north and east sides of the EEM property. This plan also shows the City’s sewer easement in the vicinity of Lower Grape Street (Heritage, 2012).

4.1.2 OHM Use, Storage, and Waste Management History

The following storage of oil and hazardous materials (OHM) has been compiled from Site Plans and the working knowledge of current EEM personnel.

The following lists storage tanks currently on site (August 2019):

- No. 2 Oil Storage: 2,000 gallons. This steel tank is in a concrete vault adjacent to the south side of building No. 28, and is no longer used. The tank contains a residue of oil that could not be removed in pumping. Visual inspection of the vault indicated no apparent petroleum staining on the concrete floor of the vault and a tank present in the vault.
- Varnish Makers and Painters (VM&P) Naphtha Storage: 2,000 gallons. This steel tank is in a concrete vault and is no longer used. The tank contains a residue of naphtha solvent that could not be removed in pumping. Visual inspection of the vault indicated no apparent staining on the concrete floor of the vault and a tank present in the vault.
- Hazardous Waste (waste acid) Storage: 1,000-gallon fiberglass reinforced polyester (FRP) tank located in the wastewater treatment room, Building 11. This tank is spill protected.
- 4,000-gallon former hazardous waste (waste acid) storage: This tank is no longer in use and is located outside the west wall of the former Ames Sword building. This tank is spill protected.

More recently, OHM has been used in quantities exceeding five gallons in the following areas:

- Paint shop: Materials are stored and used in drums and containers with capacities ranging from 1 to 55 gallons. Drums are stored on concrete floors inside the building. Containers are stored in fire cabinets or on the concrete floor.
- Former conveyor degreaser: The unit ran from date unknown to 2009. VM&P naphtha was stored and handled in a conveyORIZED degreaser machine. The naphtha was held in a sump in the machine and in adjacent storage tanks with a capacity of 275 gallons. The machine was located on a concrete floor inside the building. The naphtha tanks were in a concrete vault immediately adjacent to the building. All wastes from the machine were handled in 55-gallon drums. For a period, the waste was distilled and recovered in the artisan still. Still bottoms (while the still operated) and spent solvent were disposed of off-site in 55-gallon drums via licensed vendors.
- No. 2 Heating Oil and VM&P Naphtha: Bulk quantities of oil and VM&P naphtha were stored in steel tanks which are in concrete vaults. The VM&P vault is equipped with vapor monitoring as part of the spill detection/prevention scheme. This equipment is no

longer used, since EEM discontinued bulk VM&P naphtha storage around 2009. The heating boiler was taken out of service around 2007. Both tanks were regularly inspected and levels monitored and recorded as part of the spill prevention and detection program while these tanks were in use.

- Etch chemistry (ferric chloride solution, mineral acids solutions): Etching chemistry is received and disposed of in 55-gallon drums. Etching machines or etching tanks contain working quantities of the etching chemistry. The machines are located on spill protected sumps which, in turn are located on concrete floors inside the buildings. Etch chemistry and etching wastes have been handled in bulk. There were 2 tanks located in a rubber lined concrete spill containment near the northeast corner of Building No.11. There were two (one as of 2015) tanks located at the southeast corner of the former Ames Sword building. These tanks were used for regulated hazardous waste collection. Waste was picked up via tanker truck in the yard area. There have been no reportable spills from the waste handling operations.
- Wastewater Treatment: The wastewater treatment operation, located in a basement under the east end of Building 11 involves sodium hydroxide, proprietary polymers as well as partially treated wastewater. This operation generates metal hydroxide sludge. EEM disposed of this sludge as bulk waste concurrent with waste acid disposal as noted above. As of 2012, the hydroxide sludge has been processed with a plate and frame filter press, the clear water discharged to the City of Chicopee Water Pollution Control Facility (Chicopee WPCF) and the sludge disposed of as regulated waste in Gaylord boxes. Clear water was discharged under the NPDES permit through 2000 and has discharged to Chicopee WPCF since. Filled and partly filled boxes of metal hydroxide sludge are stored inside Building 11.
- Printing and Silk Screening Wastes: Print and silk screen support products come in containers with capacities of less than 5 gallons; waste is collected in 55-gallon drums for off-site disposal.
- Drummed waste: Drummed waste was formerly stored in a roofed and open-walled building south of Building 11. The building was removed around 2010. Drummed waste is now stored inside Building 11 near its point of generation.
- Waste Lubricating Oil: Maintenance activities formerly generated waste lubricating oil which was collected in 55-gallon drums and disposed of off-site as regulated waste. These activities terminated around 2010. Vendors who service oil-containing equipment such as the central air compressor now remove spent oil with them at the conclusion of their service calls.

EEM processes three kinds of metal: aluminum, stainless and brass:

- Aluminum, despite relatively intense review of metal specifications, has never been

known to contain lead.

- Stainless has never been known to contain lead.
- Brass. The material specification for brass calls out a content of 0.07% (maximum) of lead. There has never been a detectable quantity of lead in the EEM wastewater treatment sludge or in EEM wastewater discharges. The US EPA, in its “fact sheet” which was part of the issue of a NPDES permit in 1995 stated “there does not appear to be a likelihood for the violation of water quality standards and there were no requirements established”.

Lead has been used in the following processes at EEM:

- Painting: Process painting which employed lead terminated about 2009. All waste from the painting operation has been disposed of in 55-gallon drums as regulated hazardous waste at least since 1991. (Air Pollution Source Registration and Emission Statements formerly showed the use, but no emission of lead through 2009).
- Offset Printing: Wastes from offset printing called “print water” tested positive for lead. EEM has terminated the offset printing operation. All wastes from the printing operation have been disposed of in 55-gallon drums as regulated hazardous waste at least since 1991. EEM stopped offset printing in June 2014.
- Metal Photo®: Metal Photo® is a process involving the use of photographic fixer and photographic developer. These wastes have tested positive for “toxicity characteristic leaching procedure” (TCLP) lead. All wastes from the Metal Photo operation have been disposed of in 5-gallon containers, at least since 1991. EEM stopped using Metal Photo® in June 2019
- Miscellaneous Metal Coating: EEM employs several processes to coat metal “Paint Chips” were generated from the cleaning relieving part of the paint process. Where etched sheets with resist were painted, cured, soaked in a solvent then scrubbed to remove the excess paint and resist with only paint left inside the etched areas. Paint chips tested positive for lead before lead use was discontinued. All waste from the scraping operation have been disposed of in 55-gallon drums as regulated hazardous waste at least since 1991.

The 1968 Factory Mutual fire insurance survey plan discussed above indicates the presence of five former storage tanks (Factory Mutual, 1968, copy in **Appendix C**). These tanks have since been removed according to EEM personnel:

- Two 10,000-gallon hydrochloric acid ASTs located east of No. 11;
- One 1,000-gal UST of Solvasol located south of No. 11;
- One 4,000-gal UST of Solvasol located just west of Tailrace #1; and,
- One 10,000-gal UST for fuel oil located partially under the north side of No. 28-A.

In June 2018, a ground-penetrating radar (GPR) survey of the area over the location of the three historic USTs produced no signatures indicative of a tank, thus corroborating their prior removal. The date of removal of the USTs is not known.

4.1.3 Environmental Permits and Compliance History

The Site was issued a NPDES permit in 1995. The wastewater treatment operation discharged the clear water under the NPDES permit through 2000 and has discharged to the Chicopee Water Pollution Control Facility (WPCF) since.

4.2 *Underground Utilities*

The following underground utilities are present at the Site that might influence soil or groundwater quality and/or influence the direction of groundwater flow.

4.2.1 *Tailrace & Flood Gate Control Structure*

- In the 1800s, a canal was constructed in Chicopee to divert water from the Chicopee River in order to provide multiple factories with water power. Water was diverted from the canal into penstocks (i.e., headraces), allowed to fall and create power in water wheels, and was then returned to the Chicopee River via tailraces. There are at least five such head/tailraces from the Chicopee canal to the Chicopee River (**Figure 2**) all of which flow from south to north. Tailrace #1 is located under several buildings which now belong to EEM.
- The Chicopee River flooded as result of the 1938 hurricane. Factories that existed along the Chicopee River did not escape the flooding. The former owner of the current EEM property was financially damaged as a result of the hurricane and the property fell into the ownership of the City of Chicopee as a result of tax title.
- Tailrace #1 and presumably the other headrace/tailraces were generally closed as part of work conducted by the USACE and WMECO circa 1954, after the Hurricane of 1938.
- EEM (or its predecessors) purchased their current property from the City of Chicopee and A.G. Spalding & Bros., Inc. in several transactions between 1939 and 1942. The property had previously been inundated with flood sediment during the Hurricane of 1938, including six to eight feet deep in the basement levels of Building No. 28.
- US Army Corps of Engineers (USACE) design plans dated 1940 show the location of the flood wall that was constructed along the southern side of the Chicopee River on EEM property (USACE, 1940, **Sheet 11**, copy in **Appendix D**). USACE took an easement on land north of EEM's most northerly building in order to build and maintain the flood wall (shown on **Figure 5**).
- Stormwater collector drains were also constructed within the USACE easement, between the EEM building and the flood wall (USACE, 1940, **Sheet 16**, copy in **Appendix D**). Eight-inch diameter toe drains were installed along the building foundation to control groundwater elevation and to allow groundwater to flow to the FGCS#1 from each direction. FGCS #1 was constructed at the mouth of Tailrace #1 and receives water from a 12-inch diameter upgradient stormwater collector drain, the toe drains, and Tailrace #1. Water leaves FGCS #1 via a 24-inch diameter collector drain, and flows west, parallel to the Chicopee River, to FGCS #2 at Tailrace #2, which has a similar design and function but is located on another property. Both FGCSs also have gates that can be opened directly to the Chicopee River.

- Correspondence indicates that the entry into Tailrace #1 from the Canal was sealed with concrete around 1954. An engineering plan prepared for by George J. Hughes dated March 28, 1968 shows Tailrace #1, which is noted as “Raceway (not in use).”
- Tailrace #1 is an arched brick structure 11 feet wide at its base and just under six feet high. The construction date of Tailrace #1 is not known, but was likely sometime in the 1800s concurrent with construction of the Canal. The tailrace, from the former water wheel power house to FGCS #1, is approximately 200 feet long. The canal-side entry into Tailrace #1 is sealed with concrete, which occurred circa 1954.

EEM has found no documentation indicating that it ever used Tailrace #1. Ownership history of Tailrace #1 is in part as follows:

- The two parcels currently owned by EEM through which Tailrace #1 runs (Parcels 9 and 10) were conveyed to the City of Chicopee in August 1940 and in April, 1941 by A.G. Spalding & Bros. Inc (“AGS”). AGS reserved an easement “for the purpose of maintaining and operating a water wheel and generator located upon the property,” and an easement for “canal or raceway purposes” relating to that waterwheel.
- In two separate transactions, the City of Chicopee conveyed Parcel 10 in December, 1940 and Parcel 9 in December, 1942 to EEM’s predecessors. In the deed for Parcel 10, the City reserved rights to “a certain waterwheel, generator and raceway located upon the property.” In both deeds, the City reserved an easement for “maintaining and operating a waterwheel and generator” and “for the purpose of carrying water from a waterwheel and generator located on the property.” The City apparently released those easement rights in 1944.
- In January, 2015, the City purchased a water rights easement in Tailrace #1 from EEM “for the purpose of repairing, replacing, altering, reconstructing, and maintaining Connecticut River Flood Control Dike-South Bank Chicopee River and Dwight Pumping Station and its appurtenances.”
- Sampling results discussed in **Section 4.2.4** below indicate that several hundred cubic yards of material in Tailrace #1 contain metals and petroleum at concentrations above the RCs, Method 1 standards, and, in the case of Chromium, above the UCL.

4.2.2 Tailrace Materials – Initial Sampling by City

At some point prior to 2015, the USEPA asked the City of Chicopee to improve water quality in the Chicopee River, a tributary to the Connecticut River. To this end, the City of Chicopee designed and undertook a program to make improvements to their stormwater infrastructure.

In 2015, as part of the stormwater improvement project, the City of Chicopee purchased an

easement from EEM which included Tailrace #1. The easement gives the City of Chicopee rights to control the water and maintain the tailrace as necessary. It is our understanding that the City took similar easements over the other Canal-to-Chicopee River tailraces

In the summer of 2015, the City of Chicopee's contractor started the upgrade work in FGCS #1, which included testing and removal of the accumulated sediment within this structure. A photograph taken at the time shows accumulated material to consist of primarily sand and gravel. The City's contractor emptied FGCS #1 and placed sand bags along the lower portions of the mouth of Tailrace #1 to retain three to four feet of remaining sediment within Tailrace #1. The contractor returned in September 2015 to find that the sand bag wall had been partially toppled by the sediment, and some additional sediment had entered FGCS #1; the contractor was reportedly not able to continue their work. The additional sediment within FGCS #1 apparently had physical characteristics different from the material removed in July. On September 28, 2016 the City's civil engineer (GZA GeoEnvironmental, Inc.) had the contractor sample the tailrace sediment and toe drain sediment materials for laboratory analysis.

On November 6, 2015, the City of Chicopee forwarded a summary of their laboratory results to EEM. Several metals and petroleum were detected in the sediment samples. The results are summarized in **Table 1** and are discussed in **Section 4.2.4** below.

4.2.3 Tailrace Materials Evaluation

Between November 2015 and February 2016, EEM evaluated the City's laboratory results and the location of the samples, and determined that the material did not meet the MCP definition of "soil" or "sediment". Therefore, the laboratory results were not reflective of a release to the environment. EEM used the information as the basis for independent evaluation of the material in Tailrace #1, and soil and groundwater outside Tailrace #1 as described below to evaluate the potential for a release of OHM to the environment.

Tailrace #1 is a brick arch structure with a concrete floor (USACE, 1940). It is 5'10" tall at the center of the arch and 11 feet wide. There are roughly three to four feet of unconsolidated material within the tailrace, both at its terminus at FGCS#1, and near the center at CB-1. Tailrace #1 is approximately 200 feet long. Using an average thickness of 3.5 feet, the cross-sectional area of the tailrace fill is 35 square feet. There are approximately 260 cubic yards of material in the tailrace.

On **February 9 and 10, 2016** OHI supervised the pumping of water from Tailrace #1 to collect confirmatory samples of the material within Tailrace #1. Water was pumped from CB-1 at a rate of approximately 60 gallons per minute (gpm), and from FGCS#1 at a rate of approximately 120 gpm. Effluent from both pumps was discharged into the City of Chicopee interceptor sewer at the manhole 54 feet west of CB-1, under prior arrangement with the Sewer Department. The two pumps lowered the water level within FGCS#1 within 5-10 minutes, but within 5 minutes of turning off the pumps, the water level in FGCS#1 returned to the original level.

On **February 10, 2016**, OHI personnel supervised the collection of samples from within Tailrace #1 for laboratory analysis of EPH carbon range and target analytes, 14 MCP total metals, TCLP metals on results greater than the EPA 20x rule, and Hexavalent Chromium at ConTest Analytical Laboratory in East Longmeadow, MA (ConTest). The samples were collected from the following locations:

SED-1: Mouth of Tailrace #1, east side behind the sandbag wall, rusty brown-grey, wet.
 SED-3: Mouth of Tailrace #1, west side behind the sandbag wall, grey-black, wet.
 SED-2: under CB-1, top red-brown layer, 2-4" thick, wet, gelatinous, petroleum odor.
 SED-4: under CB-1, lower black layer, ~3-4 feet thick, wet, gelatinous, petroleum odor. SED-2 and SED-4 are shown in Photographs 11 & 12 (**Appendix A**).

Hennigan Engineering, Inc. of Hingham, MA was retained to video tape the interior of Tailrace #1 using a robot camera with wheels. The goal was to run the robot on top of the material within Tailrace #1 up to the former water wheel location and down to FGCS#1 to view the condition of the brick arch structure, and to locate possible pipes or openings where water could be entering Tailrace #1. On **February 10, 2016**, the robot was lowered into CB-1 but, the material within the tailrace would not support the weight of the camera. Video from the CB-1 location indicates the brick arch structure is in good condition at this vicinity; however, the camera was not able to locate any pipes or water input opportunities, to view the former water wheel powerhouse, or to view the walls of Tailrace #1 below the top of the material which was three to four feet thick at this location.

4.2.4 Laboratory Results - Tailrace Materials

Laboratory results of Tailrace #1 material sampling by the City of Chicopee in 2015 are summarized in **Table 1**, and were included in the *Phase I ISI-Appendix F* (OHI, 2017).

Laboratory results of the 2016 OHI samples SED-1 through SED-4 from Tailrace #1 are also summarized in **Table 1** alongside the laboratory results from the samples collected by the City of Chicopee for direct comparison. Copies of the laboratory report were included in *Phase I ISI-Appendix G* (OHI, 2017).

The results indicated the presence of Chromium, Nickel, Antimony, and Benzo(a)pyrene at concentrations above the respective RCS-2 and/or Method 1 standards. Chromium was detected in all four samples at concentrations ranging from 490 mg/kg to 4,900 mg/kg. The concentration of Chromium in sample SED-4 (4,900 mg/kg) collected at CB-1 was above the Upper Concentration Limit (UCL). Nickel was detected in SED-4 at 1,700 mg/kg. Antimony was detected in SED-2 at 39 mg/kg. Benzo(a)pyrene was detected in SED-3 at 7.4 mg/kg.

These results are similar to the City's sampling laboratory results, except that the City's Tailrace #1 and Tailrace #2 samples also contained Lead, and were not analyzed for Nickel. The highest concentrations of Chromium detected by the City were from within Tailrace #1 (3,400 mg/kg) and Tailrace #2 (3,600 mg/kg). This similarity suggests that the contents of the two tailraces are chemically similar and derived from a similar source. Other metals and petroleum fractions were

detected in each of these four samples but, at concentrations below the respective RCS-2 or Method 1 standards.

None of the City's or the SED samples contained Lead or Chromium with TCLP results in excess of 5.0 mg/L. Hexavalent Chromium was not detected in any of the SED samples; therefore, Hexavalent Chromium analyses were not conducted on subsequent samples. The material in Tailrace #1 was determined to not exhibit characteristics of a hazardous waste.

Ownership of Tailrace #1 is with the City of Chicopee. This includes ownership of the sampled contents of the tailrace and responsibility to operate and maintain Tailrace #1.

4.2.5 *Municipal Sewer*

The City of Chicopee has a sewer easement that runs from Lower Grape Street, through the center of the EEM property, and continues westward through the Ames Privilege property. Sewer pipes within this easement run above/across Tailrace #1. A copy of the sewer plans is provided in **Appendix E**.

4.2.6 *US Army Corps of Engineers - Stormwater Control*

US Army Corps of Engineers (USACE) design plans dated 1940 show the location of the flood wall that was constructed along the southern side of the Chicopee River on EEM property (USACE, 1940, **Sheet 11**, copy in **Appendix D**). USACE took an easement on land north of EEM's most northerly building in order to build and maintain the flood wall (**Figure 5**).

Stormwater collector drains were also constructed within the USACE easement, between the EEM building and the flood wall (USACE, 1940, **Sheet 16**, copy in **Appendix D**). Eight-inch diameter toe drains were installed along the building foundation to control groundwater elevation and to allow groundwater to flow to the FGCS#1 from each direction. FGCS #1 was constructed at the mouth of Tailrace #1 and receives water from a 12-inch diameter upgradient stormwater collector drain, the toe drains, and Tailrace #1. Water leaves FGCS #1 via a 24-inch diameter collector drain, and flows west, parallel to the Chicopee River, to FGCS #2 at Tailrace #2, which has a similar design and function but is located on another property. Both FGCSs also have gates that can be opened directly to the Chicopee River.

4.2.7 *Underground Storage Tanks*

In **June 2018**, OHI observed a ground-penetrating radar (GPR) survey of the area between wells OHI-10 and OHI-11 to confirm the presence or absence of the 10,000-gallon heating oil UST, and the two Solvasol USTs shown on the 1968 Site Plan, and depicted on **Figure 5**. GPR survey results of these portions of the Site did not register the presence of a steel structure resembling a UST. The date of removal of the USTs is not known.

4.3 Geology

A review of USDA soil maps indicates that the Site consists exclusively of Urban land-Hinckley-Windsor association. These soils are primarily paved or covered with buildings consisting of sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist. This material is considered well drained. As the Site has been developed with buildings and other structures since at least 1840, and at this point can be considered fully developed, there is little shallow soil remaining at the Site which has not been re-worked at least once.

4.3.1 Soil Borings & Soil Sampling

On **April 15, 2016**, OHI supervised the drilling of three soil borings (B-1 through B-3) which were converted to monitoring wells (OHI-1 through OHI-3). OHI-1 was in an upgradient corner of the EEM property close to Lower Grape Street. OHI-2 and OHI-3 were located just west of Tailrace #1 on the north and south sides of the City's sewer easement between the two EEM buildings. The goal was to determine if the material within Tailrace #1 was being released to the environment. Boring logs were included in the *Phase I ISI-Appendix H* (OHI, 2017).

A soil sample from each of the soil borings was retained and submitted to ConTest for laboratory analysis of EPH carbon range and target analytes and 14 MCP total metals. Sample B-3 S-2 9-10' from OHI-3 was also submitted for petroleum fingerprint by EPA Method 8015. The sample exhibiting the highest PID reading from each boring was selected for analysis. The laboratory samples ranged in depth from seven to eight feet below grade (b.g.) in OHI-1 to nine to ten feet b.g. in both OHI-2 and OHI-3. Soil above these horizons in each of these two borings did not exhibit elevated PID field screening results or visual evidence of contamination. Near surface soil in each of the soil borings exhibited evidence of fill material. Ash and brick were observed in boring B-2 and B-3 to depths of at least six feet.

On **May 10, 2016** OHI supervised the drilling of four soil borings (B-4 through B-7) which were converted to monitoring wells (OHI-4 through OHI-7). OHI-4 was located east of Tailrace #1 between the EEM buildings, as a local sampling point upgradient of the Tailrace. OHI-5 and OHI-6 were located on the east and west sides of Tailrace #1 at the EEM upgradient southerly property line. OHI-7 was located west of OHI-6 along the EEM upgradient southerly property line. Boring logs are included in **Appendix G**.

A soil sample from each of the soil borings was retained and submitted to ConTest for laboratory analysis of EPH carbon range and target analytes and 14 MCP total metals. The sample exhibiting the highest PID reading from each boring was selected for analysis. The samples ranged in depth from six to eight feet b.g. in B-4 and B-7 to eight to ten feet b.g. in B-6.

On **September 26, 2017** OHI observed the drilling of eleven soil borings (B-2A, B-3A, B-4A, B-5A, B-7A and B-8 through B-13). Shallow soil samples from depths ranging from three to five feet below grade (b.g.) were collected from borings B-2A, B-3A, B-4A, B-5A, B-7A, B-8, B-10 and B-13 and submitted to ConTest for analysis of 14 MCP total metals. Additional soil samples were collected from B-9 through B-13 and submitted to ConTest for analysis of 14 MCP

total metals and EPH with target analytes.

Soil borings B-8 through B-13 were converted to monitoring wells (OHI-8 through OHI-13). OHI-8 was located south of the maintenance building along to property line with Ames Privilege, west of OHI-7. OHI-9 through OHI-13 were located west of Tailrace #1 in the alley between the EEM buildings, on either side of the municipal sewer easement. OHI-9 and OHI-13 were located on the south side of the sewer easement and OHI-10, OHI-11 and OHI-12 were located north of the sewer easement. Boring logs are included in **Appendix G**.

4.3.2 Laboratory Results - Soil

EPH

Laboratory results indicated that EPH carbon range and target analytes were detected in ten of the 13 soil samples analyzed. C9-C18 Aliphatics were detected in OHI-3 S-2 (4,700 mg/kg) and B-10-7' (8,700 mg/kg) above the Method 1 S-2 standard of 3,000 mg/kg but below the Upper Concentration Limit (UCL) of 20,000 mg/kg. C9-C18 Aliphatics were also detected in OHI-12-12' (2,200 mg/kg) above the Method 1 S-1 standard of 1,000 mg/kg but below the S-2 standard of 3,000 mg/kg. C11-C22 Aromatics were detected in OHI-10-7' (1,300 mg/kg) above the Method 1 S-1 standard of 1,000 mg/kg but below the S-2 standard of 3,000 mg/kg. EPH carbon range and target analytes were detected in the remaining eight soil samples analyzed, but below the Method 1 S-1 standards. Laboratory results of the soil samples are summarized in **Tables 2A/B**, and copies of the 2016 laboratory reports were included in *Phase I ISI-Appendix G* (OHI, 2017). Laboratory data reports for soil sampling conducted in 2017 are included in **Appendix H**.

Results of the petroleum fingerprint analysis on sample B-3 S-2 9-10' from OHI-3 indicated petroleum in the C9-C36 range (diesel/heating oil) at a concentration of 3,900 mg/kg [16D0767].

14 MCP Total Metals

Laboratory results indicated concentrations of Lead in soil from OHI-2 S-2 (810 mg/kg) and B-4A-4' (1,000 mg/kg), above the Method 1 S-2/3 standard (600 mg/kg). Both of these samples were collected in the alley between EEM buildings on the south side of the sewer easement. Lead was also detected in soil from B-8-3' (340 mg/kg), B-10-7' (310), B-11-11' (230), B-12-12' (290 mg/kg) and B-13-14' (210 mg/kg), above the Method 1 S-1 standard (200 mg/kg) but below the S-2/3 standard (600 mg/kg).

Sample B-12-12' contained Antimony (130 mg/kg) above the Method 1 S-2/3 standard (30 mg/kg), but below the UCL of 300 mg/kg. Antimony was also detected in soil from B-10-7' (26 mg/kg) above the Method 1 S-1 standard (20 mg/kg) but below the S-2/3 standard (30 mg/kg).

The remaining 19 soil samples analyzed for metals contained detected levels of some or all of the following metals at concentrations below the Method 1 S-1/2/3 standards (Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Nickel, Silver, Thallium, Vanadium, Zinc, and Mercury). Laboratory results of the soil samples are summarized in **Table 2**, and copies of the 2016 laboratory reports are included in *Phase I ISI-Appendix G* (OHI, 2017). Laboratory data

reports for soil sampling conducted in 2017 are included in full in **Appendix H**.

4.4 Hydrogeology

4.4.1 Monitoring Well Installations

Two-inch diameter PVC monitoring wells with 10-foot screens were installed in each of the soil boring locations and named OHI-1 through OHI-13. Silica sand was used as backfill around the screened sections, drill cuttings were backfilled to near surface, and bentonite and concrete surface seals finished each of the flush-mounted protective covers as indicated in the MassDEP *Standard Reference for Monitoring Wells* (WSC-310-91). Boring Logs showing well construction details are included in **Appendix G**.

4.4.2 Groundwater Sampling

On **April 15, 2016**, OHI field personnel collected groundwater samples from monitoring wells OHI-1 through OHI-3 using low-flow sampling methods. The samples were submitted to ConTest for laboratory analysis of EPH carbon range and target analytes and 14 MCP dissolved metals. Samples OHI-1, OHI-2 and OHI-3 were also submitted for petroleum fingerprint by EPA Method 8015.

On **May 11, 2016**, OHI field personnel collected groundwater samples from monitoring wells OHI-4 through OHI-7 using low-flow sampling methods. The samples were submitted to ConTest for laboratory analysis of EPH carbon range and target analytes and 14 MCP dissolved metals.

On **October 3, 2017**, OHI field personnel collected groundwater samples from monitoring wells OHI-7 through OHI-13 using low-flow sampling methods. The sample from OHI-7 was submitted to ConTest for laboratory analysis of 14 MCP dissolved metals to confirm the presence of lead detected in earlier sampling of this well. The samples from OHI-8 through OHI-13 were submitted to ConTest for laboratory analysis of EPH carbon range and target analytes and 14 MCP dissolved metals.

On **June 4, 2018**, OHI field personnel collected a groundwater sample from monitoring well OHI-13 using low-flow sampling methods. The sample from OHI-13 was submitted to ConTest for laboratory analysis of EPH carbon range and target analytes to confirm the presence of C9-C18 Aliphatics detected in earlier sampling of this well.

4.4.3 Laboratory Results - Groundwater

Laboratory groundwater results for the **April/May 2016** sampling of OHI-1 through OHI-7 are summarized in **Table 3**. Laboratory data reports were included in the *Phase I ISI-Appendix G* (OHI, 2017). No EPH or metals were detected above the Method 1 standards, except that 54

ug/L of Lead was detected in the sample from OHI-7, above the Method 1 GW-3 standard of 10 ug/L.

Laboratory results of groundwater sampling on **October 3, 2017** from OHI-7 through OHI-13 [17J0115 in **Appendix H**] indicated EPH carbon range and target analyte concentrations below Method 1 standards except for C9-C18 Aliphatics (5,600 ug/L) in OHI-13 which was above the Method 1 GW-2 standard of 5,000 ug/L and below the Method 1 GW-3 standard of 50,000 ug/L. The May 2016 concentration of dissolved Lead (54 ug/L) from OHI-7 was above the Method 1 standard (10 ug/L), but the October 2017 results indicated no detection above 1.0 ug/L; the earlier Lead results were not confirmed. Both sets of results are summarized in **Table 3**.

Laboratory results of groundwater sampling on **June 4, 2018** from OHI-13 [18F0317 in **Appendix H**] indicated EPH carbon range and target analyte concentrations below Method 1 standards. The October 2017 concentration of C9-C18 Aliphatics (5,600 ug/L) from OHI-13 was above the Method 1 GW-2 standard (5,000 ug/L), but the June 2018 results indicated only 200 ug/L; the earlier EPH results were not confirmed. Both sets of results are summarized in **Table 3**.

4.4.4 Groundwater Flow Direction

Based upon surface and estimated bedrock topography, groundwater is generally estimated to flow northerly downhill toward the Chicopee River (**Figures 1 and 3**). Due to the presence of the flood control wall, most groundwater is expected to be collected via toe drains as part of the stormwater collection system on the south side of the flood control wall. The storm sewer flows to the west inside the flood wall for approximately 1,500 feet where it discharges to the Chicopee River (**Figure 2**). The Chicopee River discharges to the Connecticut River approximately 4,500 feet west of the Site.

On **May 25, 2016**, OHI personnel surveyed the seven existing monitoring wells for location and elevation, and measured depth to water in each. On **October 3, 2017**, OHI personnel surveyed the six new monitoring wells for location and elevation relative to the initial seven wells. The data is presented in **Table 4** and was used to construct **Figures 6A and 6B**, water table maps illustrating the direction of groundwater flow. **Figure 6A** shows groundwater contours on **May 25, 2016**, a date when the Canal contained water. **Figure 6B** shows groundwater contours on **October 3, 2017**, a period when the Canal had been drained and the cracked Canal concrete walls were being patched. Measured depth to groundwater was between one foot lower at OHI-3 near the northern portions of the Site and four feet lower along the southern Site boundary near the Canal on October 3, 2017 when the Canal was dry. Groundwater was found to flow in a radial pattern on both dates with the high point near Tailrace #1 and the southern property boundary, flowing northeast and north and northwest all toward the Chicopee River. The Canal wall repairs were completed and the Canal again contains water. Conditions at the Site now likely to resemble those shown in **Figure 6A**.

Local transport characteristics that may influence the direction or character of groundwater flow across the Site include the following:

- a) The Canal walls upgradient of the EEM property appear to be leaking, as water is known to flow through Tailrace #1 toward the north. Pumping of the tailrace and FGCS#1 at a rate of roughly 180 gpm was able to lower the water level, but once the pumps stopped, water levels returned to pre-pumping conditions in less than five minutes.
- b) A city sewer line bisects the EEM property from east to west. Construction of this sewer and its former counterparts within the sewer easement have disturbed the natural soil and have likely altered groundwater flow patterns across portions of the EEM property.
- c) A City/USACE storm sewer line crosses the EEM property from east to west along its northern border with the Chicopee River. Construction of this storm sewer circa 1940 disturbed the natural soil and has likely altered groundwater flow patterns across portions of the EEM property.
- d) A bermed drain in the wastewater room exists in the eastern end of EEM building No. 11. Discharge from this drain is piped to the City/USACE storm drain system north of building No.28 as a permitted NPDES discharge.
- e) Footing drains are shown to exist under the basement floor of building No. 28, discharging to City/USACE storm sewer lines north of building No. 28, and likely lowering/controlling the water table in this area (USACE, 1940, **Appendix D**).
- f) Footing drains installed in the early 90's along the south and east side of building No. 11 discharge to the storm sewer lines east of buildings No. 11 and 28. Groundwater used to leak into the wastewater treatment room which was then pumped and treated through the wastewater system. The footing drains fixed this issue.
- g) The contour maps **Figures 6A/B** indicate that Building 28 and Tailrace #1 act as local dams for groundwater flow, forcing groundwater to then flow in part east and west along the alley.

5.0 NATURE & EXTENT OF RELEASE

Soil analyses conducted at the EEM property identified petroleum, Lead, and Antimony above Method 1 Standards. Petroleum, Lead, and Antimony in soil were found in the alley between EEM buildings along the sewer easement in proximity to Tailrace #1. Petroleum and Lead detections in groundwater above Method 1 standards could not be replicated in follow-up sampling rounds.

5.1 Tailrace Materials

5.1.1 City of Chicopee Sampling in 2015

In January 2013, the City's civil engineer (GZA GeoEnvironmental, Inc.) collected samples from Tailrace #1 under the EEM Building #28 and/or the FGCS#1. Laboratory results did not indicate any contaminants released to the environment above applicable RCs under the MCP.

In the summer of 2015 the City of Chicopee's contractor, Gardner Construction, started the upgrade work in FGCS #1, which included removal of the accumulated material within this structure. Photograph #8 in **Appendix A**, taken at the time, shows this material to be primarily sand and gravel. The City's contractor emptied FGCS #1 and placed sand bags along the lower portions of the mouth of Tailrace #1 to retain three to four feet of material remaining within Tailrace #1. The contractor returned in September 2015 to find that the sand bag wall had partially collapsed, and some additional material had entered FGCS #1. As such, the contractor was reportedly not able to continue their work. The additional material within FGCS #1 apparently had physical characteristics sufficiently different from the material removed in July that on September 28, 2015 GZA had the contractor sample the tailrace material and toe drain materials for laboratory analysis.

On November 6, 2015, the City of Chicopee forwarded a summary of their laboratory results (**Appendix F** and **Table 1**) to EEM which indicated the presence of several metals and petroleum in three samples. The map of the sampling locations was provided by the City on December 1, 2015.

On January 20, 2016, the City of Chicopee sent a letter to EEM indicating that on October 26, 2015 they had sampled "soil materials" in four locations at FGCS#2 at the mouth of Tailrace #2 on Ames Privilege property and detected "similar soil contamination" in those samples. *Table 2*, attached to the City's letter summarized these results and compared them to the MCP RCS-2 for soil. A plan showing the sampling locations at both Tailrace #1 and #2, and another summary of the laboratory results from Tailrace #1 (*Table 1*) was included with this letter which is included in **Appendix F**. Laboratory data received from the City in their *Table 1* & 2, are reproduced in **Table 1** for ease of comparison with OHI data.

5.1.2 Tailrace Investigation results

Laboratory results for OHI Tailrace #1 samples (SED-1 through SED-4) are summarized in **Table 1** alongside the laboratory results from the samples collected by the City of Chicopee

(from *Tables 1 & 2*) for direct comparisons. Chromium was detected in all four samples at concentrations ranging from 490 mg/kg to 4,900 mg/kg. Nickel was detected in SED-4 at 1,700 mg/kg. Antimony was detected in SED-2 at 39 mg/kg. Benzo(a)pyrene was detected in SED-3 at 7.4 mg/kg. These results are similar to the City's sampling laboratory results, except that the City's Tailrace #1 and Tailrace #2 samples also contained Lead, and did not test for Nickel. The highest concentrations of Chromium detected by the City were from within Tailrace #1 (3,400 mg/kg) and Tailrace #2 (3,600 mg/kg). This similarity suggests that the contents of the two tailraces are chemically similar and derived from a similar source.

None of the City's or the SED samples contained Lead or Chromium with TCLP results in excess of 5.0 mg/L. Hexavalent Chromium was not detected in the SED samples, therefore; Hexavalent Chromium analyses were not conducted on subsequent samples. The material in Tailrace #1 was determined to not exhibit characteristics of a hazardous waste.

The Tailrace materials contain elevated concentrations of Chromium and Nickel, metals not found at elevated concentrations outside Tailrace #1. Soil outside Tailrace #1 contains Lead, but at generally lower concentrations than inside Tailrace #1. The EPH petroleum signatures of Tailrace #1 and soil outside Tailrace #1 are not similar. These differences indicate a different source for petroleum and metals inside and outside Tailrace #1, and are one indication that Tailrace #1 material is contained within that structure and not migrating.

The source of OHM present in Tailrace #1 materials is not known, but was likely former Ames and/or Spaulding manufacturing processes which used Tailrace #1 as a convenient waste disposal location. Other possible sources include industrial activities at upgradient property, or being part of the sediment which is reported to have buried portions of the Site during the 1938 hurricane.

Ownership of Tailrace #1 is with the City of Chicopee. This includes ownership of the sampled contents of the tailrace and responsibility to operate and maintain Tailrace #1. Tailrace #1 is the responsibility of the City of Chicopee. EEM does not control this portion of the property.

5.2 Soil

EPH

Laboratory results indicated that EPH carbon range and target analytes were detected in ten of the 13 soil samples analyzed. **C9-C18 Aliphatics** were detected in OHI-3, B-10-7', and OHI-12-12' above the Method 1 S-1 standard. C11-C22 Aromatics were detected in OHI-10-7' above the Method 1 S-1 standard. EPH carbon range and target analytes were detected in the remaining eight soil samples analyzed, but below the Method 1 S-1 standards. Laboratory results of the soil samples are summarized in **Table 2**.

Results of the petroleum fingerprint analysis on sample B-3 S-2 9-10' from OHI-3 indicated petroleum in the C9-C36 diesel/heating oil range at a concentration of 3,900 mg/kg [16D0767].

Based upon these soil results, an area of concern (**AOC-1**) for petroleum in soil from six to 12

feet was drawn to include OHI-3, OHI-10, and OHI-12 between the two EEM buildings as shown on **Figure 7**.

The source of detected petroleum was likely an historic 10,000-gallon heating oil UST located partially under Building #28-A or its piping to the nearby former furnace location shown on the Factory Mutual Fire Insurance Companies survey plan #10661 of EEM (1968, **Appendix C**) and depicted on **Figure 5**. GPR survey of this portion of the alley between EEM buildings did not register the presence of a steel structure resembling this UST. The date of removal of this UST is not known.

MCP-14 Total Metals

Laboratory results indicated concentrations of **Lead** in soil from OHI-2 S-2 and B-4A-4', above the Method 1 S-2/3 standard and in B-8-3', B-10-7', B-11-11', B-12-12' and B-13-14', above the Method 1 S-1 standard (200 mg/kg) but below the S-2/3 standard (600 mg/kg).. With the exception of B-8-3', these samples were collected in the alley between EEM buildings adjacent to the sewer easement.

Sample B-8-3' contained Zinc (1,200 mg/kg) above the Method 1 S-1 standard (1,000 mg/kg).

Sample B-12-12' contained **Antimony** above the Method 1 S-2/3 standard (30 mg/kg), but below the UCL of 300 mg/kg. Antimony was also detected in soil from B-10-7' above the Method 1 S-1 standard (20 mg/kg) but below the S-2/3 standard (30 mg/kg).

The boring log for B-8-3'/OHI-8 (**Appendix G**) indicates the presence of brick, coal, and coal ash from the surface to a depth of five feet. The source of Lead and Zinc detected in B-8-3' is the anthropogenic fill material at this location. Therefore the Lead and Zinc at this location are exempt from reporting under the MCP (310 CMR 40.0317(9)).

The source of Lead and Antimony in soil at OHI-2, B-4, B-10-7', B-11-11', B-12-12', and B-13-14' may be related to coal and coal ash noted in the alley/sewer easement fill materials, or it may be related to former industrial activities.

The remaining 14 soil samples analyzed for metals contained detected levels of some or all of the following metals at concentrations below the Method 1 S-1/2/3 standards (Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Nickel, Silver, Thallium, Vanadium, Zinc, and Mercury). Laboratory results of the soil samples are summarized in **Table 2**.

Based upon these soil results, an area of concern (**AOC-2**) for **Lead** and **Antimony** in soil from just below pavement to a depth of 14 feet was drawn to include OHI-2, OHI-4, OHI-10, OHI-11, OHI-12, and OHI-13 between the two EEM buildings as shown on **Figure 7**.

Soil Summary

Based upon these results, the impacts to soil outside Tailrace #1 do not appear to be connected to the fill material inside Tailrace #1. The suite of metals detected in Tailrace #1 are different from those detected in soil and those metals that were detected in both samples were detected at

different relative concentrations. The petroleum in soil in AOC-1 appears to be trapped against the foundation of Building 28 and the tailrace structure. Petroleum was not detected in groundwater above Method 1 standards. Therefore, there is no significant migration of petroleum via groundwater.

5.3 Groundwater

OHI field personnel collected groundwater samples from each of the 13 monitoring wells OHI-1 through OHI-13 using low-flow sampling methods. The samples were submitted to ConTest for laboratory analysis of EPH carbon range and target analytes and/or MCP-14 dissolved metals. Samples OHI-1, OHI-2 and OHI-3 were also submitted for petroleum fingerprint by EPA Method 8015. Laboratory groundwater results for OHI-1 through OHI-13 are summarized in **Table 3**.

EPH

EPH petroleum compounds were detected in the groundwater samples from OHI-2, OHI-3, and OHI-10 through OHI-13. These locations are all west of Tailrace #1 in the alley between EEM buildings along the sewer easement. Petroleum was not detected in groundwater in other locations at the Site. The October 2017 concentration of C9-C18 Aliphatics (5,600 ug/L) from OHI-13 was above the Method 1 GW-2 standard (5,000 ug/L), but the June 2018 re-sampling results indicated only 200 ug/L; the earlier results were not confirmed. Based upon these groundwater results, there are no areas of concern for petroleum in groundwater at the Site.

Results of the petroleum fingerprint analysis on samples OHI-1, OHI-2, and OHI-3 were all in the diesel/heating oil C9-C36 range [16D0767]. EPH analyses of the same samples indicated no detections in OHI-1 and detections below Method 1 standards in OHI-2 and OHI-3.

The source of detected petroleum was likely an historic 10,000-gallon heating oil UST located partially under Building #28-A or its piping to the nearby former furnace location shown on the Factory Mutual Fire Insurance Companies survey plan #10661 of EEM (1968, **Appendix C**) and depicted on **Figure 5**. GPR survey of this portion of the alley between EEM buildings did not register the presence of a steel structure resembling this UST. The date of removal of this UST is not known.

MCP-14 Total Metals

Laboratory results of groundwater detected the presence of 13 of the MCP-14 dissolved metals in groundwater. The May 2016 concentration of dissolved Lead (54 ug/L) from OHI-7 was above the Method 1 standard (10 ug/L), but the October 2017 results indicated no detection above 1.0 ug/L; the earlier results were not confirmed. Both sets of results are summarized in **Table 3**.

The source of lead in groundwater at OHI-7 may be related to coal and coal ash noted in the near-surface fill materials, or it may be related to former industrial activities on the upgradient Ames Privilege (former Spaulding) property. Based upon these groundwater results, there are no areas of concern for metals in groundwater at the Site.

5.4 *Evaluation of Uncontrolled Sources*

Based upon the soil and groundwater results, there are no identified uncontrolled sources of OHM at the EEM Site.

5.5 *Migration Control*

EPH

Laboratory results indicated that **C9-C18 Aliphatics** were detected in soil samples OHI-3 S-3, B-10-7', and B-12-12' above the Method 1 S-1 standard of 1,000 mg/kg but below the Upper Concentration Limit (UCL) of 20,000 mg/kg. EPH petroleum compounds were detected in the groundwater samples from OHI-2, OHI-3, and OHI-10 through OHI-13, but at concentrations below the Method 1 GW-2/3 standards. With the northerly groundwater flow direction, petroleum in soil appears to be trapped against the foundation of Building 28/28-A and Tailrace #1. The source of petroleum in this area was likely the historic 10,000-gallon heating oil UST which is no longer present. These lines of evidence suggest that the petroleum in soil is not migrating in either solid or dissolved phases.

14 MCP Total Metals

Laboratory results indicated concentrations of **Lead** in soil from OHI-2, B-4A-4', B-10-7', B-11-11', B-12-12' and B-13-14' above the Method 1 S-1 standard. These samples were collected in the alley between EEM buildings adjacent to the sewer easement. Sample B-12-12' contained **Antimony** (130 mg/kg) above the Method 1 S-2/3 standard (30 mg/kg), but below the UCL of 300 mg/kg. These instances of metals in soil were not correlated with elevated detections of the same metals in groundwater. Therefore, the detected metals in soil do not appear to be migrating.

6.0 CONCEPTUAL SITE MODEL

The Site and surrounding area have been developed for industrial use and water power since the mid-1800s. Water levels within the Canal vary over time according to the schedule of the power company, and changes in Canal water level change the hydraulic flow patterns at the Site. The Canal was shut down for a period in 2016 to repair cracks in its walls to help it contain water. Groundwater has been measured to flow from south to north across the Site.

Fill materials were identified in soil borings from across much of the Site. This fill could have been imported during construction, could be part of the sediment which is reported to have buried portions of the Site during the 1938 hurricane, or could also be from on-Site activities over the years. It is likely that the portions of fill containing coal and coal ash could be a source of Lead detected in soil and groundwater at the Site.

Industrial activities at the Site include the use of multiple acids, petroleum, and metals. While there have been no reported spills of these materials, petroleum, Antimony, and Lead have been detected in soil and groundwater.

6.1 Tailrace

Ownership of Tailrace #1 is with the City of Chicopee. This includes ownership of the sampled contents of the tailrace and responsibility to operate and maintain Tailrace #1. EEM does not control this portion of the property. The petroleum and metals in Tailrace material are not connected to the petroleum or metals detected in soil or groundwater outside Tailrace #1 at the Site, or visa versa.

6.2 Soil

The source of detected petroleum in soil was likely an historic 10,000-gallon heating oil UST located partially under Building #28-A or its piping to the nearby former furnace location. GPR survey of this portion of the alley between EEM buildings did not register the presence of a steel structure resembling this UST. The date of removal of this UST is not known. Petroleum in soil does not appear to have migrated far from its source. An area of concern (**AOC-1**) for petroleum in soil from six to 12 feet was drawn to include OHI-3, OHI-10, and OHI-12 between the two EEM buildings as shown on **Figure 7**.

The source of **Lead** in soil in the alley adjacent to the sewer may be related to coal and coal ash noted in the fill materials, or it may be related to former industrial activities. Sample B-12-12' contained **Antimony** above Method 1 S-2/3 standards that was likely related to historic manufacturing at the Site. The detected **Lead** and **Antimony** in soil does not appear to have migrated. An area of concern (**AOC-2**) for **Lead** and **Antimony** in soil from just below pavement to a depth of 14 feet was drawn to include OHI-2, OHI-4, OHI-10, OHI-11, OHI-12, and OHI-13 between the two EEM buildings as shown on **Figure 7**.

6.3 *Groundwater*

The October 2017 concentration of **C9-C18 Aliphatics** (5,600 ug/L) from OHI-13 was above the Method 1 GW-2 standard (5,000 ug/L), but the June 2018 re-sampling results indicated only 200 ug/L; the earlier results were not confirmed. Based upon these groundwater results, there are no areas of concern for petroleum in groundwater at the Site.

The May 2016 concentration of dissolved **Lead** (54 ug/L) from OHI-7 was above the Method 1 standard (10 ug/L), but the October 2017 results indicated no detection above 1.0 ug/L; the earlier results were not confirmed. Based upon these groundwater results, there are no areas of concern for metals in groundwater at the Site.

7.0 ANALYTICAL DATA USABILITY ASSESSMENT

Pursuant to 310 CMR 40.1056(2)(k) of the MCP and in accordance with MassDEP Policy #WSC-07-350 *MCP Representativeness and Data Usability Assessments* (September 2007), an assessment of the data quality and an evaluation of representativeness have been conducted for the analytical data collected at this Site. The Data Usability Assessment is a systematic evaluation of the uncertainty associated with the analytical data points in terms of accuracy, precision, and completeness. Data determined to be scientifically valid, defensible, and of a sufficient level of accuracy, precision, and completeness to support this submittal were then considered to be suitable for use in a Representativeness Evaluation. The Representativeness Evaluation serves as a final determination of data reliability with respect to the accuracy, precision, representativeness (temporal and spatial), comparability, completeness, and sensitivity of the data collected to represent the attributes and analytical concentration of the total population.

7.1 *Intended Use of Data*

The Data Quality Objectives (DQOs) for data collected during this investigation were to support assessment of soil, groundwater, and Tailrace fill material at the Site, and to support the LSP Opinion of No Significant Risk. The MCP standards, action limits, and laboratory reporting limits were all chosen based upon Site-specific criteria.

7.2 *CAM Compliance*

The MassDEP's Compendium of Analytical Methods (CAM) is a collection of laboratory methods designed and approved by MassDEP to produce data of known accuracy, precision and sensitivity. As such, the accuracy, precision and sensitivity of CAM Compliant data do not require additional evaluation in an Analytical Data Usability Assessment; they provide presumptive certainty to the regulated community from a laboratory data generation perspective. Site media samples analyzed after August 1, 2003 are considered Compendium of Analytical Methods (CAM) data and meet the prescribed data quality requirements of the MCP defined by 310 CMR 40.0017 and 40.0191(2)(c). CAM compliant analyses are determined using an "MCP Analytical Method". CAM compliant analyses comply with method-specific QC analytical requirements specified in the CAM. CAM compliant analyses are determined with an evaluation of compliance with method-specific performance standards, with deficiencies narrated, and are reported in the format specified in the CAM for MCP analytical data. Other types of analytical data (CAM Non-compliant, Non-CAM, and Pre-CAM) require evaluation to identify what information is available to assess the accuracy, precision, and sensitivity of these data points, and the comparability of these data to CAM compliant data. The laboratory data for this project were acquired using CAM compliant analyses.

7.3 *Field Quality Control Data Usability Assessment*

The field quality control program ensures that the data are of a quality suitable for their intended uses. Proper sampling containers, preservation, hold times, and handling procedures were

employed when sampling, as indicated on the sample delivery group case narrative and/or the Chain-of-Custody. Grab and composite samples were collected from soil using proper sampling techniques.

7.4 Data Quality Objectives

The Data Quality Objectives (DQOs) for the data collected during the course of this investigation are to provide data of adequate quality to support the LSP Opinion of No Significant Risk. The MCP standards, action limits, and laboratory reporting limits were all chosen based upon Site-specific criteria. These objectives were met.

7.5 Representativeness Evaluation

The Representativeness Evaluation includes analysis of the Conceptual Site Model, data collection approach, field screening data, selection of sampling locations and depths, number and spatial distribution of sampling locations, temporal distribution of data points, critical samples, and completeness. A detailed discussion of the adequacy of these aspects is included in the following subsections.

7.5.1 Conceptual Site Model

The Conceptual Site Model (CSM) is detailed above in **Section 6.0**.

7.5.2 Data Collection Approach

The data collection approach was intended to provide sufficient data to support an eventual finding of No Significant Risk and submittal of a PSNC Statement for the RTN.

7.5.3 Field Screening Data

The soil borings extended from the ground surface to below the observed impacted soil, and to a depth where the PID field screen values decreased from the highest reading at each location. In this manner, the zones of highest potential petroleum impacts were identified. PID values are recorded in **Table 2** and shown with sample locations on the Boring Logs in **Appendix G**.

7.5.3 Selection of Sampling Locations and Depths

The soil samples were collected from depths identified as having the highest potential for impacts based upon visual evidence and PID screening values. Thus, sampling locations were selected appropriately to evaluate the current nature and extent of the impacts at the Site.

7.5.4 Number and Spatial Distribution of Sampling Locations

Soil and groundwater samples were collected from representative areas of the Site. Multiple rounds of sample collection were conducted in a phased approach, each building on the results of the prior information.

7.5.5 Temporal Distribution of Samples

Temporal distribution of soil samples is not applicable at this Site. Resampling and analysis of

select groundwater samples was not able to confirm the earlier detections of Lead and EPH target analytes.

7.5.6 Critical Samples

All soil and groundwater samples are considered critical samples.

7.5.7 Data Collection Evaluation

Quality control in the field is primarily assured by following standard operating procedures for the type of sample collection activity and/or field screening. Standard operating procedures are based on industry standard practices, MassDEP guidance documents/policies, and EPA protocols. Samples for this investigation were collected following these standard procedures.

The number and location of sampling points chosen in the field were designed to be representative of the media sampled and reflect both the “release”, and the potential release areas at the Site.

7.5.8 Data Validation

We reviewed the data to evaluate whether the precision and accuracy of the supplemental soil data are appropriate for their intended use, per the MCP, 310 CMR 40.0017 (1). This evaluation was based upon a review of results for:

- Sample collection;
- Holding times;
- Laboratory blanks;
- Laboratory control samples;
- Laboratory duplicates;
- Matrix spike/matrix spike duplicates; and
- Surrogate spike recoveries.

There are no known deviations in the data collection or analytical methods for this project. The samples were properly collected and were extracted and analyzed within specified holding times. Some flags were marked within the laboratory report indicating variations in reporting limits or problems during analysis. Each laboratory data package was reviewed by the Project Manager/LSP for this project; a QAQC Worksheet for each laboratory report follows the report in **Appendix H**.

The samples were received in accordance with the Chain-of-Custody and no significant deviations were encountered during preparation or analysis unless otherwise noted.

Laboratory method blanks analyzed with each batch of samples were free from contamination. Laboratory control sample recoveries were within acceptance limits. Laboratory duplicate results generally compared well, indicating acceptable laboratory precision. A Matrix Spike and Matrix Spike Duplicate (MS/MSD) for MassDEP EPH CAM were analyzed with these soil samples. An elevated reporting limit due to high concentration of an interfering analyte, Silver in samples B-10-7' and B-9-12' was noted in the soil laboratory report 17I1251.

Surrogate spikes are compounds added to each sample to evaluate sample-specific effects. Surrogates are evaluated based on their percent recovery (%R) which is optimally 100%, indicating the laboratory detected the entire amount of spike added to the sample. Surrogate %R's were within acceptance limits for each of the samples analyzed for this project with the exception of 2-Fluorobiphenyl in samples B-11-11' and B-12-12' due to suspected sample matrix interference as noted in the QAQC Worksheet for the laboratory report [1711251]. Chromatogram(s) were attached to the report. For sample B-10-5', the sample to spike ratio was greater than or equal to 4:1. Spiked amount was not representative of the native amount in the sample. Appropriate or meaningful recoveries could not be calculated for Barium, Lead and Zinc in B-10-5'.

7.5.9 Completeness

In total, 21 soil, and 15 groundwater samples were collected at the Site. The soil and groundwater sampling results confirm that the extent of the release at the Site is known. Assessment and remediation at the Site are now complete.

7.5.10 Summary of Data Usability Assessment

The data for this project were collected using standard operating procedures and analyzed using CAM-compliant methods. The number, location, and timing of samples are representative of the Site and useful to characterize the residual Source Area of soil remaining at the Site. Based on the Analytical Data Usability Assessment and Representativeness Evaluation, additional assessment is not required for this Site.

8.0 RISK CHARACTERIZATION

Under the MCP, Risk Characterization is required for certain disposal sites where oil and/or hazardous materials have been detected. The Risk Characterization evaluates whether residual chemicals detected at a disposal site pose a risk of harm to human health, safety, public welfare, and the environment or are only present at levels that pose No Significant Risk (NSR). A level of NSR exists if Site concentrations are below applicable standards established in the MassDEP guidance or if the cumulative cancer risk at the Site does not exceed one in one hundred thousand (10^{-5}), the hazard index does not exceed one, and the Site does not pose a risk to safety, public welfare, or the environment based on a consideration of Site conditions and applicable standards.

Several hundred cubic yards of material were found in Tailrace #1. As Tailrace #1 is a brick structure with walls and a floor, this material has been determined to not be located “in the environment”. Review of soil analytical results and groundwater contours indicates that the soil issues outside Tailrace #1 and the material inside Tailrace #1 are not connected. Ownership of Tailrace #1 is with the City of Chicopee. This includes ownership of the sampled contents of the tailrace and responsibility to operate and maintain Tailrace #1. Therefore, the material inside Tailrace #1 is not part of RTN #1-20060 and not included in this Risk Characterization.

8.1 Selection of Risk Characterization Method

There are three risk characterization methods detailed in the MCP. A Method 1 Risk Characterization compares the conditions at the Site to promulgated MCP Method 1 Standards. The Standards have been developed by the MassDEP considering a defined set of exposures considered to be a conservative estimate of the potential exposures at most Sites. Method 1 Risk Characterizations are only applicable to those Sites where impacts are limited to soil and/or groundwater or the predominant human exposures are from soil.

A Method 2 Risk Characterization supplements and modifies the MCP Method 1 Standards with Site and chemical specific information. A Method 2 Risk Characterization can also be used to derive a Method 1 Soil Standard. Method 2 Risk Characterizations are only applicable to those Sites where impacts are limited to soil and/or groundwater.

A Method 3 Risk Characterization uses Site-specific information about the Site, the specific residual chemicals and the potential exposures to human and environmental receptors under all current and reasonably foreseeable future Site activities and uses to characterize the risk of harm.

Since the predominant potential human exposures at the Site are from soil, this PSNC uses a Method 1 Risk Characterization approach as outlined in 310 CMR 40.0984 for the Site.

8.2 Current and Foreseeable Use & Receptors

Spaulding manufactured sporting goods at the Site from the 1800s until the 1930s. EEM acquired the Site from the City of Chicopee and began occupancy of the property in 1940. EEM

prints labels and signs on metal. Adult factory workers and municipal sewer contractors comprise the current class of receptors at the Site. Future foreseeable receptors include factory workers, sewer contractors, and/or artists in lofts, or residential use if the property is sold and the use changed.

8.3 Compounds of Concern

Compounds of Concern (COCs) at the Site are:

- EPH carbon range **C9-C18 Aliphatics** detected above Method 1 standards in soil at OHI-3, B-10, and B-12, as listed in **Table 2**. As a conservative measure, all of the EPH carbon range and target analytes were carried through the Site risk characterization; and,
- **Antimony** in soil at B-10 and B-12, and **Lead** in soil detected at multiple locations in the alley adjacent to the sewer easement above Method 1 standards as listed in **Table 2**.

8.4 Determination of Applicable Standards

For purposes of evaluating site risk, soil and groundwater data collected from the Site are compared to MCP Method 1 Risk Characterization Standards according to the selection of Site soil and groundwater categories. Within an individual site, several applicable categories may be present, including one or more soil categories and one or more groundwater categories. The applicable soil and groundwater Risk Characterization Standards for the site include S-1/GW-2, S-1/GW-3, S-2/GW-2, S-2/GW-3, S-3/GW-2 and S-3/GW-3 for soils, and GW-2 and GW-3 for groundwater. The justifications for these standards are described below.

8.4.1 Soil Categories

Three soil categories for use in risk characterizations have been developed by MassDEP based on the following characteristics of exposure potential: soil accessibility, frequency of exposure to soil, and intensity of exposure to soil. Based on the relative degree of importance of each of these factors, soils are categorized as S-1, S-2 or S-3 soils. Category S-1 soils represent the greatest exposure potential (e.g. residential or school use) while category S-3 soils represent the least (e.g. isolated sub-surface soil).

The exposure potentials are based upon children's and adults' frequency of use of the area (high, low or not present), the intensity of the use (high or low) and the accessibility of the soils (accessible, potentially accessible or isolated) [310 CMR 40.0900(4) and the Soil Category Selection Matrix at 310 CMR 40.0933(9)].

Based on current site conditions where the entire Site is either paved or covered in buildings, and only adults are present, all soil at the Site meets the criteria of soil category S-3.

Under potential future use, the Site could become a residential use, in which case soil categories S-1 and S-2 would apply. Under future foreseeable uses of the Site, children could be present as residents. In this case soils at depths of less than three feet below grade in unpaved areas meet the criteria of soil category S-1. If soil is covered in pavement or buildings, the intensity of use by children becomes low and soil at the Site to a depth of 15 feet would meet the criteria of soil

category S-2. All other Site soils meet soil category S-3. This possible residential future use is the most conservative.

8.4.2 Groundwater Categories

Groundwater is categorized according to the following potential exposures:

- GW-1: Groundwater which includes potential or current sources of drinking water.
- GW-2: Groundwater which is considered to be a source of oil or hazardous material vapors to indoor air. It applies to locations where the average annual depth of the groundwater table is less than 15 feet below grade and where COCs are detected within 30 feet of an occupied structure.
- GW-3: Groundwater at all disposal sites, based on the potential for COCs to be a source of discharge to surface water, and all groundwater has the potential to discharge to surface water.

Groundwater may be classified as one or more of the above categories for a particular site.

Criteria for inclusion in GW-1 are listed in 310 CMR 40.0932(4). A review of the criteria in that section indicates that the Site does not meet the criteria for a GW-1 area because the Site is not located in a Current or Potential Drinking Water Source Area.

Most of the site has groundwater less than 15 feet below grade and is within 30 feet of buildings. Therefore, groundwater category GW-2 applies to Site groundwater.

Since all groundwater has the potential to discharge to surface water, all groundwater is considered to be category GW-3, including Site groundwater.

8.4.3 Summary of Soil & Groundwater Categories

Based upon the above analysis, the following soil and groundwater categories apply to the Site:

- S-1 GW-2 and GW-3 (under potential future use);
- S-2 GW-2 and GW-3 (under current and potential future use); and,
- S-3 GW-2 and GW-3 for current Site uses.

8.5 Exposure Pathway Evaluation

Existing and potential exposure pathways are identified and characterized in this section. The pathways to be reviewed include groundwater, surface water, soil, and air.

8.5.1 Groundwater Pathway

Groundwater at the Site is not utilized for drinking water. Groundwater at the Site discharges to storm sewer and the Chicopee River.

The October 2017 detection of **C9-C18 Aliphatics** (5,600 ug/L) from OHI-13 was above the Method 1 GW-2 standard (5,000 ug/L), but the June 2018 re-sampling results indicated only 200 ug/L; the earlier results were not confirmed (**Table 3**). Based upon these groundwater results,

there are no exposure pathways for petroleum in groundwater at the Site.

The May 2016 concentration of dissolved **Lead** (54 ug/L) from OHI-7 was above the Method 1 standard (10 ug/L), but the October 2017 results indicated no detection above 1.0 ug/L; the earlier results were not confirmed (**Table 3**). Based upon these groundwater results, there are no exposure pathways for metals in groundwater at the Site.

8.5.2 Surface Water

There are no surface water bodies at the Site. Stormwater runoff is collected in catch basins controlled by the City of Chicopee sewer department and the ACOE. Stormwater runoff eventually discharges via pipes to the Chicopee River and then the Connecticut River. There are no groundwater impacts so there is no contribution to surface water. This is not a complete exposure pathway.

8.5.3 Soil Pathway

C9-C18 Aliphatics were detected in OHI-3 S-3 (4,700 mg/kg) and B-10-7' (8,700 mg/kg) above the Method 1 S-2 standard of 3,000 mg/kg but below the Upper Concentration Limit (UCL) of 20,000 mg/kg. The source of detected petroleum was likely an historic 10,000-gallon heating oil UST located partially under Building #28-A or its piping to the nearby former furnace location. This area of the Site in the sewer easement alley between buildings is fully paved.

Laboratory results indicated concentrations of **Lead** in soil from OHI-2 S-2 (810 mg/kg) and B-4A-4' (1,000 mg/kg), above the Method 1 S-2/3 standard (600 mg/kg). Sample B-12-12' contained **Antimony** (130 mg/kg) above the Method 1 S-2/3 standard (30 mg/kg), but below the UCL of 300 mg/kg (**Table 2**). Each of these locations are between the two EEM buildings (No. 11 and No. 28) and west of Tailrace #1.

Since the nine to ten foot deep soil at OHI-2 is impacted with **Lead**, and fill containing coal and coal ash was noted in the soil above this depth, it is likely that the coal ash fill is a source of the lead at this location or that this sample was of fill material containing concentrations of Lead.

The boring log for B-8-3'/OHI-8 (**Appendix G**) indicates the presence of brick, coal, and coal ash from the surface to a depth of five feet. The source of Lead and Zinc detected in B-8-3' is the anthropogenic fill material at this location. Therefore the Lead and Zinc at this location are exempt from reporting under the MCP (310 CMR 40.0317(9)). Lead and Zinc at B-8-3' are not considered as part of this risk characterization.

Since the entire alley between buildings No. 11 and No. 28 is paved, manufacturing activities at the Site do not involved disturbance of soil, and there are no children present at the Site, the exposure potential to the Lead, Antimony, or Petroleum in soil near OHI-2, OHI-3, or OHI-12 is low. Soil exposure potential is greatest for adult utility workers excavating soil in the municipal sewer easement. Soil is a potential exposure pathway for both petroleum and metals.

8.5.4 Air Pathway

The identified Petroleum in soil near OHI-3 is located under pavement. Groundwater from OHI-3 contains petroleum and was collected from a similar depth as the soil sample. The concentration of C9-C18 Aliphatics (2,700 ug/L) in groundwater is below the Method 1 GW-2 standard (5,000 ug/L) indicating it is unlikely to negatively impact indoor air in the adjacent building No. 28. Indoor air is not a complete exposure pathway.

8.5.5 Underground Utilities

Underground utilities are present in vast numbers and various depths across most of the EEM property including the north-south Tailrace #1, east-west interceptor sewers and storm sewers, water lines, gas lines, underground electric and natural gas lines. Most of these utility lines are above the observed water table and are therefore not likely to provide preferential pathways for migration of contaminants. The Tailrace #1 structure, along with the foundation and footing of building No. 28, appears to be a dam stopping the migration of petroleum and causing it to accumulate near OHI-3 and OHI-10. There are no known underground utility migration pathways at the Site.

8.6 Exposure Point Concentrations

The concentration of chemical constituents in a medium to which an individual is exposed is termed the exposure point concentration, or EPC. As noted in the MCP at 310 CMR 40.0926, “the objective [of the EPC] shall be to identify a conservative estimate of the arithmetic mean concentration which represents the average concentration contacted by a receptor at the Exposure Point over the period of exposure.” The EPC; therefore, should be conservative (health protective) and representative of concentrations that may be encountered at the Site. Maximum concentrations may be used in screening assessments that evaluate maximum exposure potential (310 CMR 40.0926(3)(a)(2)). As required by 310 CMR 40.0926(3)(b), at least 75% of the data points used in the averaging procedure are less than the applicable standards and no data point used is greater than ten times the applicable standards. In this section, EPCs are developed for the COCs in soil and in the Tailrace #1 fill material.

8.6.1 EPCs for Soils

Soil at the Site is represented by the 21 soil samples shown in **Table 2**. All of the individual parameter concentrations are below Method 1 S-1/2/3 GW-2 and GW-3 standards except C9-C18 Aliphatics, Antimony, and Lead. The EPCs for EPH and metals were calculated for two areas of the Site, the sewer easement alley between EEM buildings (**Table 2A**), and for metals at the remainder of the Site (**Table 2B**) as discussed below. The maximum detected concentrations for all other parameters meet Method 1 standards, and they are not COCs.

C9-C18 Aliphatics in sewer easement alley: The detected concentrations ranged from 20 mg/kg to 8,700 mg/kg, and the average of the nine sample concentrations was 1,952 mg/kg which is below the residential Method 1 S-1 GW-2/3 standard of 3,000 mg/kg. Seven of the nine (78%) sample results were below the Method 1 standards.

Antimony in sewer easement alley: There was no detection of Antimony in ten of the 14 samples. The detected concentrations in the remaining four ranged from 6.2 mg/kg to 130 mg/kg, and the average of the 14 sample concentrations was 15 mg/kg which is below the residential Method 1 S-1 GW-2/3 standard of 20 mg/kg. 13 of the 14 (93%) sample results were below the Method 1 standards.

Lead in sewer easement alley: Lead was detected in all 14 samples. The detected concentrations ranged from 24 mg/kg to 1,000 mg/kg, and the average of the 14 sample concentrations was 275 mg/kg. This EPC of 275 mg/kg is below the current industrial use Method 1 S-2/3 GW-2/3 standard of 600 mg/kg, calculated with 12 of the 14 samples (86%) below the Method 1 current use standard.

When the future potential residential use is considered the 275 mg/kg EPC is above the Method 1 S-1 standard of 200 mg/kg, and only 57% of the data are below the standard. Thus the benchmark of No Significant Risk (NSR) is not met for future potential residential use.

Lead across the rest of the Site: Lead was detected in all seven samples. The detected concentrations ranged from 4.4 mg/kg to 340 mg/kg, and only one sample result (14%) was above the Method 1 S-1 GW-2/3 standard of 200 mg/kg, and the average/EPC concentration was 78 mg/kg which is below the residential Method 1 S-1 GW-2/3 standard of 200 mg/kg.

8.7 Characterization of Risk of Harm

8.7.1 Risk of Harm to Human Health

A Method 1 Risk Characterization applies to the Site.

8.7.1.1 Soil Exposure Pathway

Risk of harm to human health through the soil exposure pathway was evaluated through a comparison of concentrations in COCs to Method 1 standards. The calculated EPCs for all the EPH target analytes and metals analyzed in 21 soil samples meets Method 1 standards under current industrial use conditions (S-2/3 GW-2/3) as shown in **Table 2A** and **Table 2B**.

Under foreseeable potential future residential use, the applicable Method 1 standards would include S-1 GW-2/3. In this future potential condition, the calculated EPC for Lead of 275 mg/kg is above the S-1 GW-2/3 standard of 200 mg/kg. Therefore, a condition of NSR of harm to human health would not exist for soil without further protections, e.g. a Notice of Activity and Use Limitation (AUL).

8.7.1.2 Groundwater Exposure Pathway

There is no groundwater exposure pathway at the Site.

8.7.2 Risk of Harm to Environment

A characterization of risk of harm to the environment was evaluated. A review of Site

information did not produce any evidence of current exposure to environmental receptors. No other current or past visible evidence of physical impact to surface soil (unpaved) or wildlife was observed. Impacts to surface water or sediment related to this release are not expected. Since no current exposure has been identified, and as the maximum detected concentrations are below Method 1 Standards, a condition of NSR of harm to the environment exists in accordance with 310 CMR 40.0973(7).

8.7.3 Risk of Harm to Public Welfare

No nuisance odors resulting from the disposal Site are currently evident at the Site and none are anticipated in the future. The concentrations of COCs at the Site are not likely to produce nuisance odors during potential future uses. Use of the Site for livestock is not anticipated. The Site has not degraded the resources of the community. The Site has not resulted in the loss of active or passive use of the Property and no non-pecuniary effects are expected. The areas of impact are not expected to negatively impact the usefulness of the Property. EPCs do not exceed UCLs and the maximum detected concentrations are below Method 1 S-2/3 Standards. Therefore, in accordance with 310 CMR 40.0973(7), a condition of NSR of harm to public welfare exists at the Site.

8.7.4 Risk of Harm to Safety

An evaluation relative to the risk of harm to safety posed by current and foreseeable conditions at the Site has been made in accordance with 310 CMR 40.0960. Conditions of risk of harm to safety as defined by the MCP, including conditions that will pose a threat of physical harm or bodily injury to people have not been identified on-Site. No rusted or corroded drums or containers are located at the surface on the Site, no weakened berms are present on the Site, and no explosive vapors resulting from the release of OHM have been detected on the Site. No unsecured pits, ponds, lagoons, or other dangerous structures, or any uncontained materials related to the Disposal Site have been identified on-Site for the storage of reactive chemicals. There are no open or ongoing excavations at the Site and all wastes generated as part of remedial actions have been removed from the Site. Therefore, a condition of NSR of harm to safety exists at the Site.

8.8 Critical Exposure Pathways

Based on the compounds of concern and lack of impact to groundwater, critical exposure pathways (CEP) or potential CEPs do not exist at the Site. Residual soil analytical results indicate EPCs of COCs below Method 1 Standards.

8.9 Conditions of Substantial Release Migration

Since all residual soil concentrations are below Method 1 S-2/3 standards, there is no Condition of Substantial Release Migration.

8.10 Imminent Hazard Evaluation

Since all residual soil concentrations are below Method 1 S-2/3 standards, an Imminent Hazard

situation does not exist at the Site.

8.11 Uncertainty Analysis

This report, the investigations that support it, and the data collected are subject to uncertainties that accompany all investigations. The uncertainties are often a result of the limitations of available technology, the feasibility of further investigation, human error, instrument malfunction, weather, unknown subsurface conditions, safety, data interpretation, dated information, incomplete historical data, and a number of other factors. The scope of investigations at this, and all, disposal sites is limited to that necessary to address site conditions based on the levels and nature of contaminants encountered, potential receptors, and the physical characteristics of the site. The limitations on investigations are related to: financial expenditure vs. value of data collected; physical site features (buildings, roadways, utilities); time; and safety concerns during the completion of investigations. No investigation can sample the entire volume of any media (groundwater, soil, air, sediment, or surface water) at a disposal site. Each of these media, especially soil, is expected to exhibit variability in contaminant levels. The investigations presented in this report were appropriate in scope and magnitude to address the impacts of COCs reported for this release and the potential receptors of the release.

Analytical data is subject to many potential uncertainties related to such factors as sample collection, weather, containers, sample handling, contamination (from non-site related sources), and instrument variability. Quality assurance/quality control (QA/QC) data (such as surrogate recoveries, matrix spikes, duplicates, and blanks) aid in reducing uncertainties. QA/QC data provided with laboratory reports were reviewed to determine compliance with the method requirements. Data which fail to meet QA/QC requirement were evaluated to determine usability. The quantity of data collected increases the confidence in the results provided. While uncertainties do exist in data collection and analysis presented in this and all reports, appropriate conclusions can be formulated with this data.

Risk assessment presents additional uncertainties. The use of generic soil and groundwater standards (as specified in the MCP) is designed to conservatively approximate risk. Each of the inputs for the calculations of the standards is based on a series of assumptions. These assumptions are necessary to streamline the process and make the assessment applicable to the most common receptor. An assessment of every possible individual receptor and every possible exposure pathway is not possible. The assumptions of body weight, skin surface area, ingestion rates, inhalation rates, ventilation rates, etc. are based on a hypothetical receptor. The hypothetical receptor is modeled to represent the most likely and most sensitive receptor. Each individual presents their own variation and may be more or less sensitive to COCs at the Site. Many of the input assumptions are based on studies of the physical features and behavior of human beings and are subject to great variation and uncertainty. The individual standards of COCs adopted by MassDEP are based in part on animal testing and human studies conducted by others. Animal testing is a necessary component of determining potential effects on humans. The extrapolation of toxicological responses of animals to humans presents much uncertainty. Chemical uptake factors, absorption rates, and metabolism differ among species. The toxicity of some compounds is estimated based on the effects of similar compounds.

The pathways selected for this risk assessment also include uncertainty. Some receptors may have higher or lower exposure to each pathway. Some receptors may have exposures not addressed by the pathways assessed. The risk posed by other pathways is likely substantially lower than those assessed and is not likely to affect calculated numbers in relation to guidelines.

In summary, this risk assessment was completed with conservative assumptions in a manner consistent with current regulations and guidelines and using currently available references. The design of the risk assessment process is generally conservative and generally overestimates risk posed to potential receptors.

8.12 Conclusion of the Risk Characterization

The assessment activities have concluded that COC concentrations in soil are below applicable **Method 1 S-2/3 GW-2/3 Standards** for current use conditions at the Site. The calculated EPCs for all the EPH target analytes and metals analyzed in 21 soil samples meets Method 1 standards under current industrial use conditions (S-2/3 GW-2/3) as shown in **Table 2A** and **Table 2B**.

Under potential foreseeable future residential use, the applicable Method 1 standards would include S-1 GW-2/3. In this future potential condition, the calculated EPC for Lead of 275 mg/kg is above the S-1 GW-2/3 standard of 200 mg/kg. Therefore, a condition of NSR of harm to human health would not exist for soil without further protections (e.g. an AUL). An AUL will be placed on a portion of the alley between EEM buildings as shown on **Figure 7**. The AUL will state that the alley AUL Area shall remain paved, that the pavement will be maintained in good condition, and soil within the AUL Area may only be disturbed after a Soil Management Plan and a Health & Safety Plan have been prepared for such activities. A copy of the AUL is included in **Appendix I**.

Therefore, under current industrial use the Site has achieved NSR based upon no impacts to groundwater and the soil concentrations of petroleum hydrocarbons and metals which are below Method 1 S-2/3 standards as documented in this PSWC Statement.

Under potential foreseeable future residential use, the Site has also achieved NSR based upon the placement of an AUL to restrict access to soil.

9.0 FEASIBILITY OF ACHIEVING BACKGROUND

An evaluation of the feasibility of remediating to background concentrations is required to support a Permanent Solution, pursuant to 310 CMR 40.1020 and 40.0860. This evaluation has been conducted in accordance with *DEP Policy #WSC-04-160, Conducting Feasibility Evaluations under the MCP*, dated July 16, 2004. The stated policy includes Conditions for Categorical Feasibility and Conditions for Categorical Infeasibility, which were reviewed to determine if the Site fell into one or the other of those categories. If the Site is either categorically feasible or categorically infeasible to achieve background, a Site-specific feasibility evaluation would not be required.

9.1 Site Background

Given the conditions at the Property, Site background is assumed to be the absence of the EPH petroleum-related compounds, and metals above demonstrated naturally-occurring concentrations.

9.2 Categorical Feasibility

Section 9.3.1 of the above-referenced policy states, in part, the following:

“[I]t is DEP’s position that it is feasible to achieve background at a site where a condition of NSR [no significant risk] has been reached, the remaining contamination is limited to 20 cubic yards or less of soil contaminated solely by petroleum products, and where such soil:

- is located less than three feet below the ground surface
- is not covered by pavement or permanent structure;
- is not located within a sensitive environment (e.g., wetlands); and
- is not located in an area where removal activities will substantially interrupt public service or threaten public safety.”

Residually-impacted soils are located more than three feet below grade, contain petroleum and metals, and are entirely covered by pavement. Based on the above referenced policy, the Site is not considered to be categorically feasible to achieve background.

9.3 Categorical Infeasibility

Section 9.3.2 of the above-referenced policy states, in part, the following:

“[R]emedial actions to achieve or approach background may be considered to be categorically infeasible, i.e., the incremental cost of conducting a remedial action would be substantial and almost always disproportionate to the incremental benefit or risk reduction. In these cases, documentation that disposal site conditions are consistent with the criteria provided in any one of the subsections of 9.3.2 below would be sufficient to

support a conclusion that achieving or approaching background is not feasible.”

The subsections of 9.3.2 include: Excavations Under Permanent Structures; Remedial Actions That Will Substantially Interrupt Public Service Or Threaten Public Safety; Remediation Of Degradable (Nonpersistent) Contaminants; or Remediation Of Persistent Contaminants Located In S-2 And S-3 Soils.

Section 9.3.2.3 Remediation of Degradable (Nonpersistent) Contaminants states in part that:

“It is MassDEP’s position that achieving or approaching background can be deemed infeasible for degradable/nonpersistent contaminants regardless of media classification, except for small quantities of petroleum-contaminated soil considered accessible for remediation as described in Section 9.3.1. The benefits of additional remedial actions to achieve or approach background for degradable/nonpersistent contaminants would be considered insufficient to justify the costs of those actions.”

“Table 9-1 provides a list of contaminants that are considered degradable (nonpersistent) in the environment. This list is consistent with those organic compounds considered to be nonpersistent in the environment as provided in Table 4 of 310 CMR 40.1514(4).”

The Site involves a release of petroleum compounds, which is contained on the list on Table 9-1. The conduct of remedial work at the Site for achievement of background conditions is categorically infeasible.

Section 9.3.2.4 Remediation of Persistent Contaminants Located in S-2 and S-3 Soils states in par that:

It is DEP’s position that achieving or approaching background can be deemed infeasible for persistent contaminants in soil located in areas with lower exposure potential (i.e., S-2 and S-3 soil categories).

Table 9-2 provides a list of contaminants that are considered persistent in the environment. This list is consistent with those organic compounds considered to be persistent in the environment as provided on Table 4 of 310 CMR 40.1514(4); it also includes metals, which are considered to be persistent in the environment.

The Site involves a release of metals in S-2 and S-3 soils, which are contained on the list on Table 9-2. The conduct of remedial work at the Site for achievement of background conditions is categorically infeasible.

10.0 REMEDIATION WASTE MANAGEMENT

No remediation waste was generated as part of this investigation.

11.0 REQUIRED CONTENT OF PERMANENT SOLUTION STATEMENTS

The MCP, at 310 CMR 40.1056, sets forth the requirements for a Partial Permanent Solution Statement with No Conditions. Listed below are the specific requirements, each followed by the appropriate LSP response.

310 CMR 40.1056 (1)

A Permanent Solution Statement shall be submitted by a RP, PRP or Other Person on a form established by the Department for such purposes, and shall include, at a minimum, the following:

(a) *the site or disposal site name, address and DEP Release Tracking Number(s);*

The Disposal Site name is Eastern Etching & Manufacturing, Inc. The Disposal Site is located on a portion of the property at 35 Lower Grape Street in Chicopee, MA. The MassDEP RTN for the Site is **#1-20060**.

(b) *whether it is a Permanent Solution with No Conditions or a Permanent Solution with Conditions;*

Permanent Solution with Conditions.

(c) *except where the concentrations of oil and/or hazardous material are consistent with or have been reduced to Background or where a threat of release has been abated, the Method(s) (Methods 1, 2 or 3) used to characterize the risk of harm posed by the disposal site to health, safety, public welfare and the environment, pursuant to 310 CMR 40.0900*

A Method 1 Risk Characterization has been conducted that shows the Site poses *No Significant Risk* to human health, welfare, safety and to the environment.

(d) *the relationship of the Permanent Solution Statement to any other Permanent or Temporary Solution Statements that have been filed for the disposal site, if applicable, together with a statement as to whether any additional response actions are needed for any other portions of the disposal site;*

This PSWC for RTN 1-20060 is unrelated to other RTNs.

(e) *indication as to whether the Permanent Solution includes the implementation of an Activity and Use Limitation, and if so, the type of Activity and Use Limitation implemented at the disposal site;*

The Permanent Solution includes the implementation of an AUL.

(f) indication as to whether the Permanent Solution is based upon assumptions about the current or future site activities, uses or conditions that do not require an Activity and Use Limitation pursuant to 310 CMR 40.1013 and a description of those assumptions;

The Permanent Solution is based on an AUL to restrict future residential use of the Site. An AUL is not necessary for continued industrial use of the Site, as a condition of NSR currently exists for non-residential use.

(g) indication as to whether the Permanent Solution is based upon the effective operation of one or more Active Exposure Pathway Mitigation Measures (AEPMM) pursuant to 310 CMR 40.1025;

No. An AEPMM is not required to obtain or maintain a Condition of No Significant Risk.

(h) except where specifically exempted by the Department based upon the Department's level of involvement in the oversight of response actions at the site or disposal site, an Opinion from a Licensed Site Professional as to whether the requirements of the applicable category of Permanent Solution specified in 310 CMR 40.1000 have been met;

The LSP Opinion, set forth in BWSC Form 104, is that the requirements of the applicable Permanent Solution with Conditions, set forth in 310 CMR 40.1000, have been met.

(i) a certification of the Permanent Solution Statement and all documents submitted with the Permanent Solution Statement as required by 310 CMR 40.0009

The LSP Certification and other required documents are presented in this Permanent Solution Statement and Report, including one or more of the Appendices.

(j) indication as to whether oil and/or hazardous material exceed one or more applicable Upper Concentration Limits in Soil or Groundwater, as described at 310 CMR 40.0996;

Concentrations of oil and/or hazardous material in Soil on the Disposal Site do not exceed applicable Upper Concentration Limits as described at 310 CMR 40.0996.

(j) indication as to whether the analytical data used to support the Permanent Solution was generated pursuant to the Department's Compendium of Analytical Methods.

The Compendium of Analytical Methods was used for the data that support this PSNC.

310 CMR 40.1056 (2)

Except where previously submitted, all documentation, plans and/or reports necessary to support the Permanent Solution shall be submitted to the Department, including, without limitation, the following:

(a) As specified in 310 CMR 40.1003(4), a clear and accurate description of the location of the site, in the case of a threat of release, or the location and boundaries of the disposal site or portion of disposal site to which the Permanent Solution applies that includes the location of areas characterized as Background relative to the disposal site boundaries. Such description shall reference, to the extent practicable, the location of the site, or location and boundaries of the disposal site or portion thereof relative to permanent or semi-permanent landmarks, location coordinates, and/or surveyed boundaries;

The location of the Site, and location and boundaries of the Site or portion thereof relative to permanent or semi-permanent landmarks, and/or surveyed boundaries are provided to the extent practical. The approximate horizontal limits of the Disposal Site are up to 376 along the alley from the western property boundary to the eastern edge of the second floor bridge between buildings, by between 65 to 105 feet as the width of the alley between EEM buildings as shown in **Figure 7**. The depth ranges from just below pavement to 14 feet below grade.

(b) a succinct summary of the Conceptual Site Model;

See **Section 6.0**.

(c) a demonstration that all Sources of OHM Contamination have been eliminated or controlled as specified in 310 CMR 40.1003(5)(a) and (b);

The Sources of petroleum have been eliminated or controlled. The USTs have either been removed or are empty and out of service within concrete vaults. The metals are in fill soil in paved areas of the Site and therefore are controlled.

(d) a demonstration that response actions have been taken to adequately assess and, if necessary, control the subsurface migration of OHM remaining at the disposal site as specified in 310 CMR 40.1003(6)(a);

Adequate assessment was conducted. The EPCs for COCs in 21 soil samples from the Site were all below Method 1 standards for current use. Groundwater was not impacted by the releases. See also the Conceptual Site Model description (**Section 6.0**) and Representativeness Evaluation (**Section 7.5**).

(e) where NAPL is or has been present, a demonstration that response actions have been taken to adequately assess and if necessary control NAPL mobility and meet the requirements of 310 CMR 40.1003(7)(a);

NAPL was not detected.

(f) information supporting the conclusion that a level of No Significant Risk has been achieved or exists;

Method 1 Risk Characterization has been conducted that show the Site has achieved a condition of No Significant Risk with respect to current use without limitations and future use with implementation of an AUL (see **Section 8.0**).

(g) information documenting the extent to which levels of oil and/or hazardous material in the environment have been reduced to Background, and/or the results of the feasibility evaluation conducted pursuant to 310 CMR 40.0860 demonstrating that the achievement of Background is not feasible;

See **Section 9.0**.

(h) a copy of any and all Activity and Use Limitations which have been implemented under 310 CMR 40.1070;

A copy of the AUL is included in **Appendix I**.

(i) for Permanent Solutions with Conditions where concentrations in Soil exceed Upper Concentration Limits in Soil at a depth greater than 15 feet from the ground surface or in an area beneath an engineered barrier, the results of the evaluation conducted pursuant to 310 CMR 40.0860 demonstrating that the achievement of Upper Concentration Limits in Soil located at a depth greater than 15 feet from the ground surface or in the area beneath an engineered barrier is not feasible;

Not applicable as soil concentrations do not exceed the UCLs.

(j) for a Permanent Solution with Conditions based upon assumptions about the current or future site activities, uses or conditions that do not require an Activity and Use Limitation pursuant to 310 CMR 40.1013, documentation related to such assumptions and conditions, including, as applicable:

- 1. the recommendation and description of Best Management Practices for Non-commercial Gardening in a residential setting to minimize and control potential risk qualitatively evaluated pursuant to 310 CMR 40.0923(3)(c);*
- 2. the location of OHM that are consistent with Anthropogenic Background levels;*
- 3. the location of residual contamination within a public way or within a rail right-of-way; or*
- 4. where the residual concentrations of OHM in the groundwater exceed the GW-2 standards published in 310 CMR 40.0974(2) at a disposal site or portion thereof where no occupied building or structure is present, information related to the presence of groundwater contamination and the obligation to ensure any future construction at the disposal site does not result in OHM impacts to indoor air in newly constructed buildings or structures;*

The Permanent Solution has conditions to protect human exposure in a potential future use residential scenario. The conditions are listed in the AUL included in **Appendix I**.

(k) a Data Usability Assessment documenting that the data relied upon is scientifically valid and defensible, and of a sufficient level of precision, accuracy, and completeness to support the Permanent Solution, and a Data Representativeness Evaluation, documenting the adequacy of the spatial and temporal data sets to support the Permanent Solution; and

A Data Usability Assessment documenting that the data relied upon for the Permanent Solution is scientifically valid and defensible, and is of a sufficient level of precision, accuracy, and completeness to support the Permanent Solution has been performed (see **Section 7.0**).

(l) a description of any operation, maintenance, and/or monitoring that will be required to confirm and/or maintain those conditions at the disposal site upon which the Permanent Solution is based.

An annual Site inspection to verify that pavement in the AUL area is in good condition is included in the AUL in **Appendix I**.

310 CMR 40.1056 (3)

The Permanent Solution shall not be considered complete until the fee, if applicable, has been paid in accordance with 310 CMR 4.00.

No fee is required if a Permanent Solution is filed within 120 days of Notification of the Release or after Tier Classification. The Site has been Tier Classified, so no fee is required.

The MCP, at 310 CMR 40.1004, sets forth the Performance Standards for Permanent and Temporary Solutions. Listed below are the specific requirements, each followed by the appropriate LSP response.

310 CMR 40.1004 (1)

A Permanent or Temporary Solution shall be supported by assessments and evaluations conducted pursuant to 310 CMR 40.0000 which:

(a) are of sufficient scope, detail, and level of effort to characterize the risk of harm to health, safety, public welfare and the environment posed by the site or disposal site pursuant to 310 CMR 40.0900;

The response actions undertaken to identify the release and the subsequent assessment and remediation activities are of sufficient scope, detail, and level of effort to show that the Site does not pose a threat to the public health, welfare, safety and environment. Residual soil EPCs at the Site are below Method 1 standards for all compounds of concern, and groundwater was not impacted by the release.

(b) are consistent with the Response Action Performance Standard described in 310 CMR 40.0191;

The Response Action Performance Standard (RAPS) is the level of diligence reasonably necessary to obtain the quantity and quality of information adequate to assess a site and evaluate remedial action alternatives. This level of information is required to design and implement specific remedial actions at a disposal site in order to achieve a level of “No Significant Risk” for any foreseeable period of time and, where feasible, to reduce to the extent possible the level of oil and/or hazardous materials in the environment to background levels. All work has been conducted pursuant to the “RAPS” level of diligence, and is reflected in this Permanent Solution with No Conditions.

(c) are commensurate with the nature and extent of the release or threat of release and complexity of site conditions;

The assessment and evaluations for the Site were sufficient to demonstrate that the Response Actions conducted at the Site have achieved a condition of “No Significant Risk” at the Site.

(d) demonstrate that all requirements of the applicable Permanent or Temporary Solution pursuant to 310 CMR 40.1000 have been met; and

The requirements of a Permanent Solution with Conditions have been met. A Permanent Solution has been achieved although concentrations were not reduced to Background levels. A feasibility analysis has been conducted in accordance with DEP Policy #WCS-04-160 showing that it is not feasible to achieve background at the Site.

(e) conform with applicable requirements and procedures for conducting response actions specified in 310 CMR 40.0000.

This Permanent Solution Statement was developed in full conformance with applicable requirements and procedures for conducting response actions specified in 310 CMR 40.0000.

12.0 PERMANENT SOLUTION AND PUBLIC NOTIFICATION

12.1 Permanent Solution

A Permanent Solution, as described in 310 CMR 40.1040, has been achieved at the Site for RTN #1-20060 because a level of NSR exists under 310 CMR 40.0900 with the implementation of an Activity and Use Limitation (AUL) to ensure the existence or maintenance of a level of NSR (**Appendix I**). The concentrations of petroleum and metals in soil at the Site are below applicable Method 1 S-2/3 GW-2/3 standards for continued industrial use.

The location of the Site at 35 Lower Grape Street, Chicopee, MA is depicted on **Figures 1** through **7**, and the disposal site boundary and limits of the Permanent Solution are shown on **Figure 7**.

12.2 MassDEP Transmittal Forms

This report was submitted electronically as an attachment to the DEP's *Immediate Response Action Form* (BWSC-105) and *Permanent and Temporary Solution Statement Transmittal Form* (BWSC-104). The original Forms, appropriately completed and LSP-signed and stamped, and can be viewed along with this report at the MassDEP's web site:

<https://eeaonline.eea.state.ma.us/portal#!/search/wastesite> and searching for the Site using the RTN.

12.3 Public Notification

In accordance with the Public Notification requirements of the MCP at 310 CMR 40.1403, a notice of the availability of a Permanent Solution with Conditions Statement has been sent to the Chief Municipal Officer and the Board of Health in the City of Chicopee. A copy of the public notification letter is provided in **Appendix J**.

13.0 REFERENCES

MassDEP Policy #WSC-310-91. April 1991. Standard Reference for Monitoring Wells.

MassDEP Policy #WSC-04-160. July 16, 2004. Conducting Feasibility Evaluations under the MCP.

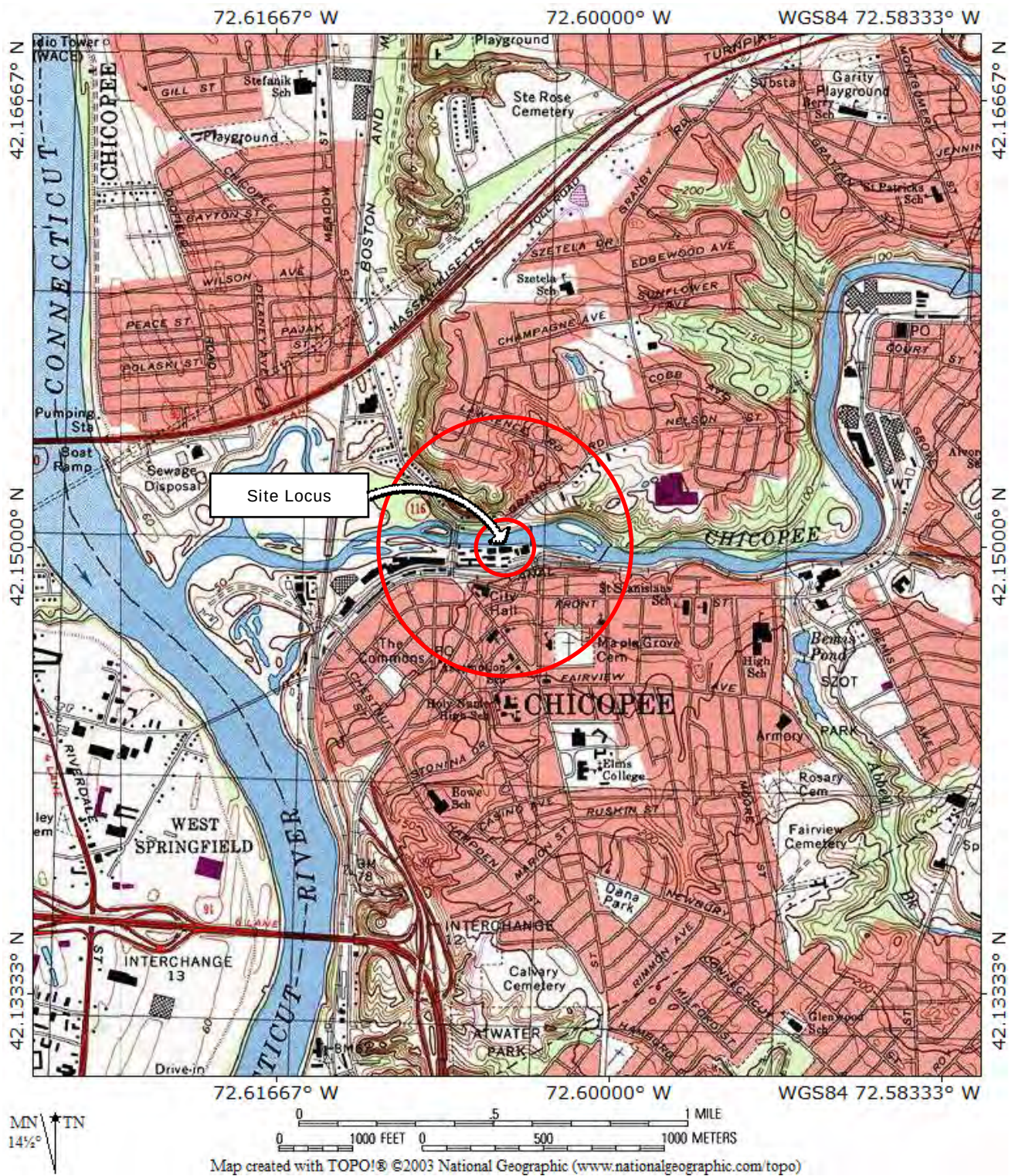
MassDEP Policy #WSC-07-350. September 2007. MCP Representativeness and Data Usability Assessments.

MassDEP letter to EEM dated September 23, 2016.

OHI Engineering, Inc. August 19, 2016. *Downgradient Property Status (DPS) Submittal, Eastern Etching & Manufacturing, Inc., 35 Lower Grape Street, Chicopee, MA 01020.*

OHI Engineering, Inc. August 11, 2017. *Phase I Initial Site Investigation & Tier Classification Submittal, Eastern Etching & Manufacturing, Inc., 35 Lower Grape Street, Chicopee, MA 01020.*

FIGURES



Latitude 42° 8' 59.72" N
Longitude 72° 36' 18.80" W

Data Source: National Geographic



Eastern Etching & Mfg.
35 Lower Grape Street
Chicopee, MA

OHI Job # 15-1700
MassDEP RTN #1-20060

Rev. Date: August 11, 2017

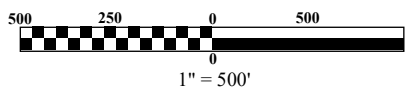
Figure 1
Locus Map

OHI
OHI Engineering, Inc.
Engineers and Environmental Scientists

44 Wood Ave
Mansfield, MA
Phone (508) 339-3929
Fax (508) 339-3140

www.ohiengineering.com

110 Pulpit Hill Rd
Amherst, MA
Phone (413) 835-0780
Fax (413) 549-7918



Latitude 42° 8' 59.72" N
Longitude 72° 36' 18.80" W

Data Source: Google Earth
USACE, 1940



OHI Job # 15-1700
MassDEP RTN #1-20060

Eastern Etching & Mfg.
35 Lower Grape Street
Chicopee, MA



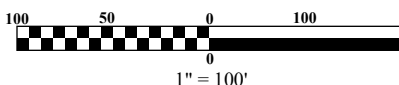
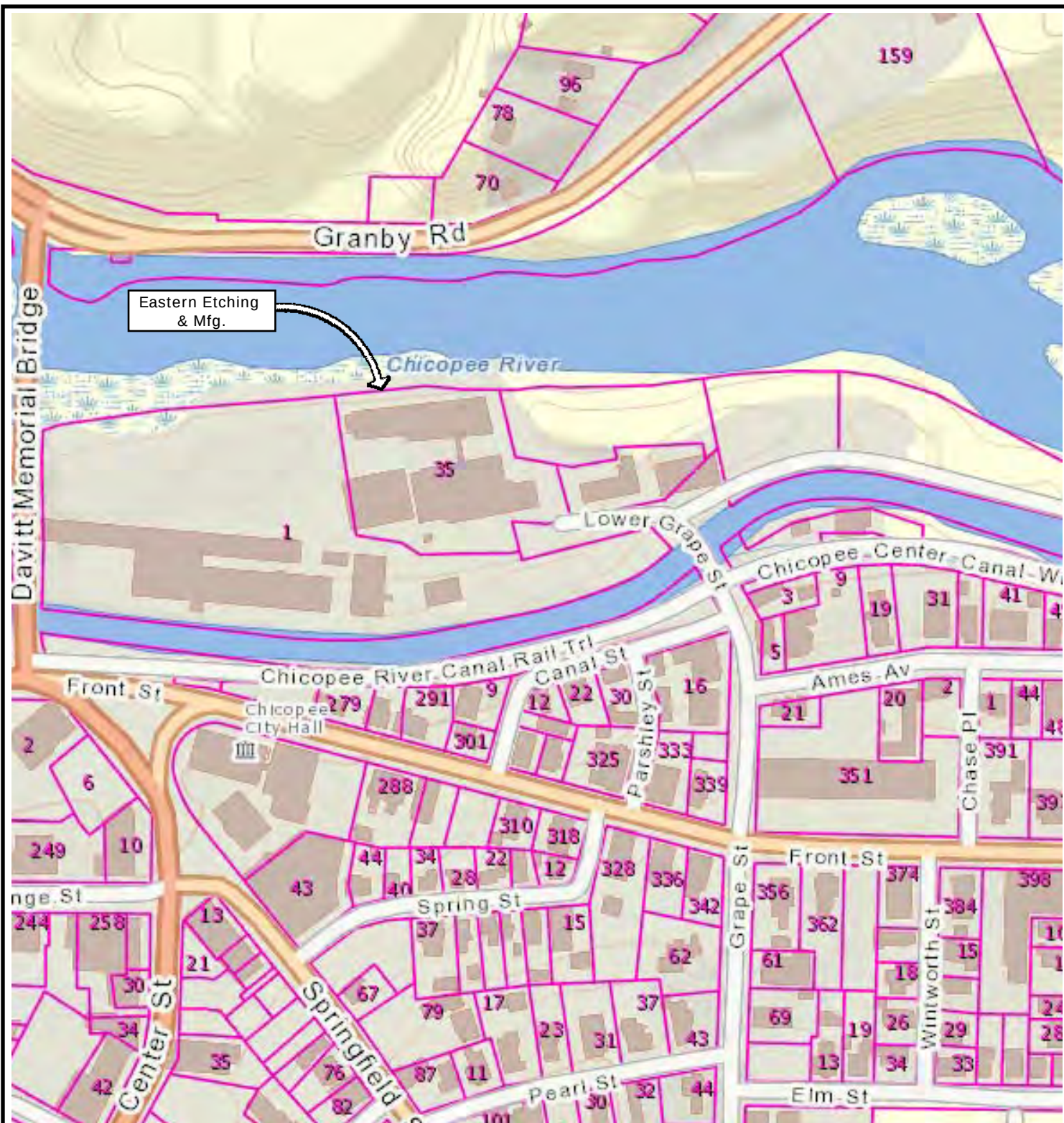
44 Wood Ave
Mansfield, MA
Phone (508) 339-3929
Fax (508) 339-3140

110 Pulpit Hill Rd
Amherst, MA
Phone (413) 835-0780
Fax (413) 549-7918

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Rev. Date: August 11, 2017

Figure 2
Orthographic



Latitude 42° 8' 59.72" N
Longitude 72° 36' 18.80" W

Data Source: Army Corps of Engineers, 1940



OHI Job # 15-1700
MassDEP RTN #1-20060

Eastern Etching & Mfg.
35 Lower Grape Street
Chicopee, MA

Rev. Date: August 11, 2017

Figure 3
Assessors Map

OHI

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www.ohiengineering.com

MassDEP - Bureau of Waste Site Cleanup

Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

Site Information:
EASTERN ETCHING & MANUFACTURING
35 LOWER GRAPE STREET CHICOPEE, MA

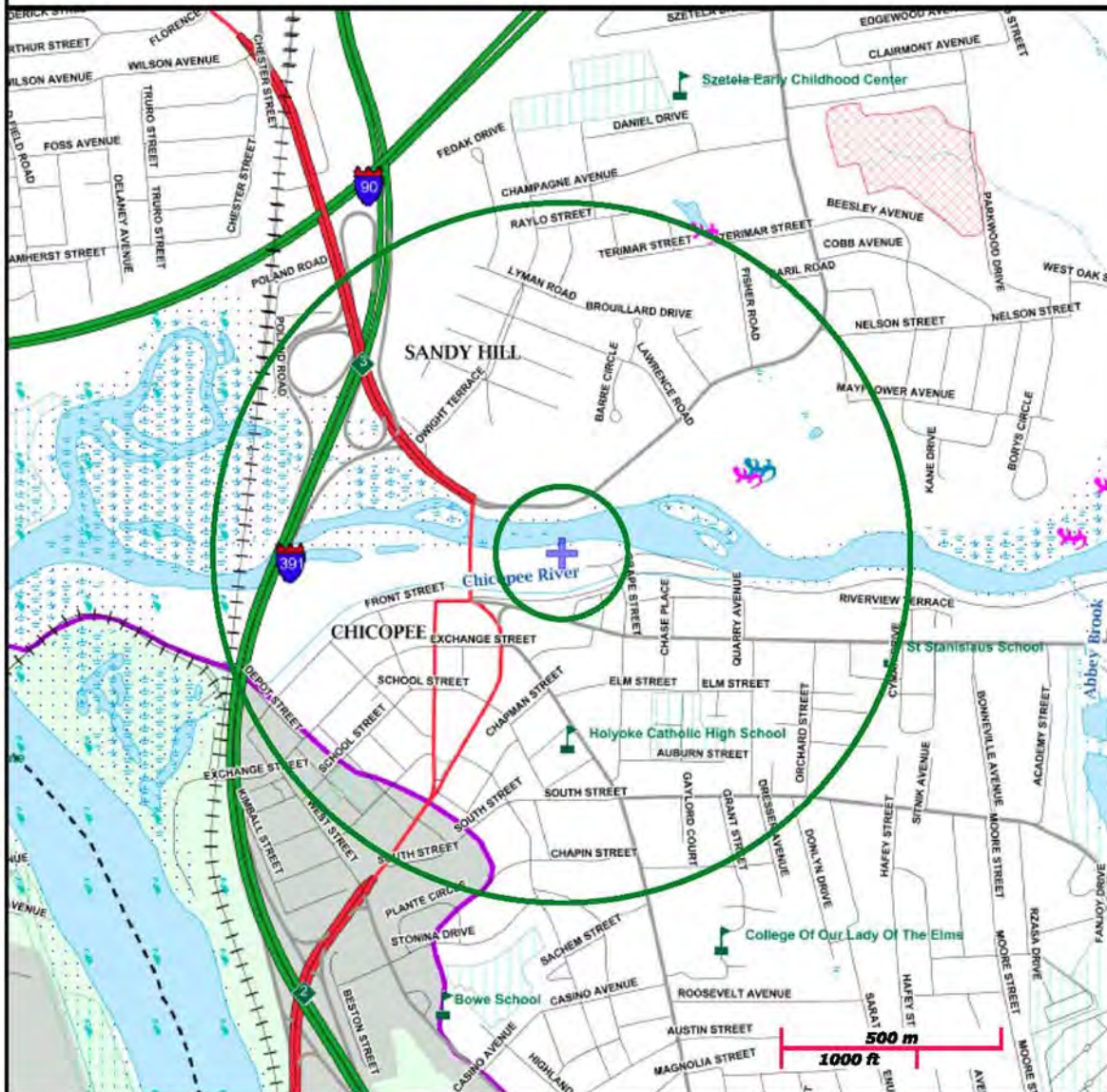
NAD83 UTM Meter:
4600196mN, 607060mE (Zone: 18)
March 28, 2016

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at:
<http://www.mass.gov/mgis/>



MassDEP

Commonwealth of Massachusetts
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail	PWS Protection Areas: Zone II, IWPA, Zone A
Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct	Hydrography: Open Water, PWS Reservoir, Tidal Flat
Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam	Wetlands: Freshwater, Saltwater, Cranberry Bog
Aquifers: Medium Yield, High Yield, EPA Sole Source	FEMA 100yr Floodplain; Protected Open Space; ACEC
Non Potential Drinking Water Source Area: Medium, High (Yield)	Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert, Potential
	Solid Waste Landfill; PWS: Com. GW, SW, Emerg., Non-Com.



Latitude 42° 8' 59.72" N
Longitude 72° 36' 18.80" W

Data Source: MassGIS,
Commonwealth of
Massachusetts Executive
Office of Environmental
Affairs IUSGS



Eastern Etching & Mfg.
35 Lower Grape Street
Chicopee, MA

OHI Job # 15-1700
MassDEP RTN #1-20060

Rev. Date: August 11, 2017

Figure 4
Priority Resource Map

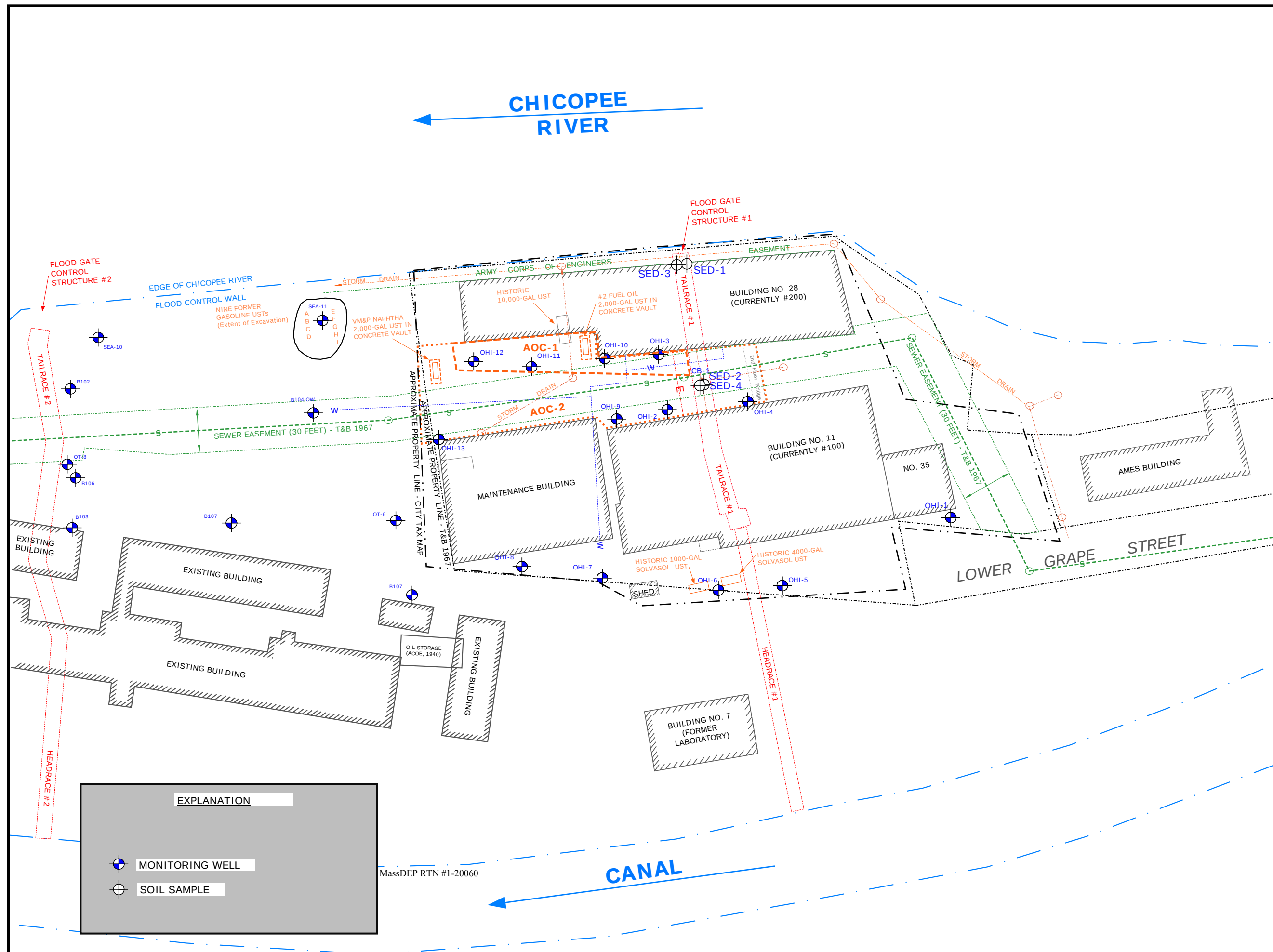
OHI

OHI Engineering, Inc.
Engineers and Environmental Scientists

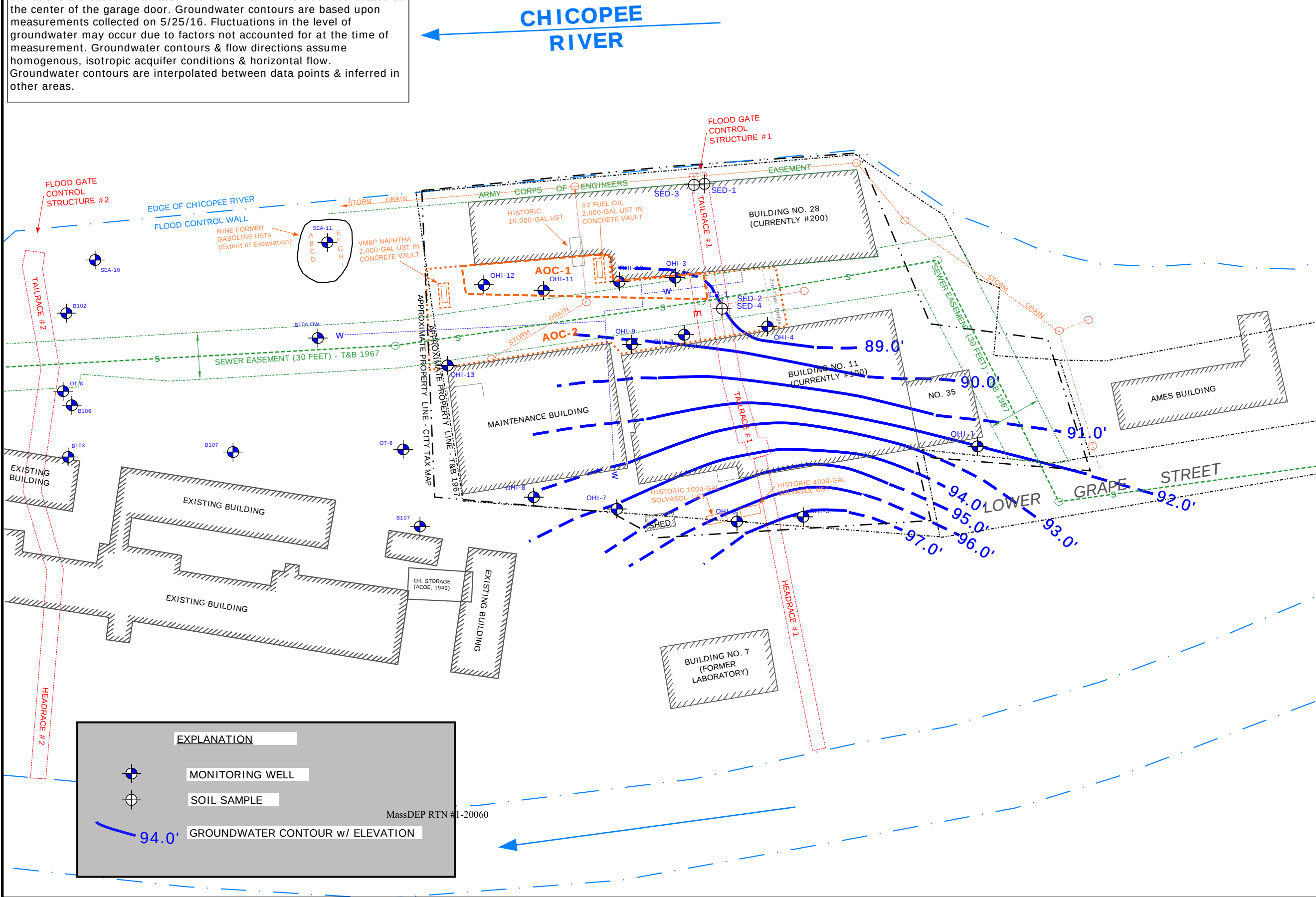
44 Wood Ave
Mansfield, MA
Phone (508) 339-3929
Fax (508) 339-3140

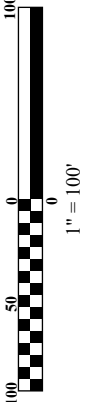
110 Pulpit Hill Rd
Amherst, MA
Phone (413) 835-0780
Fax (413) 549-7918

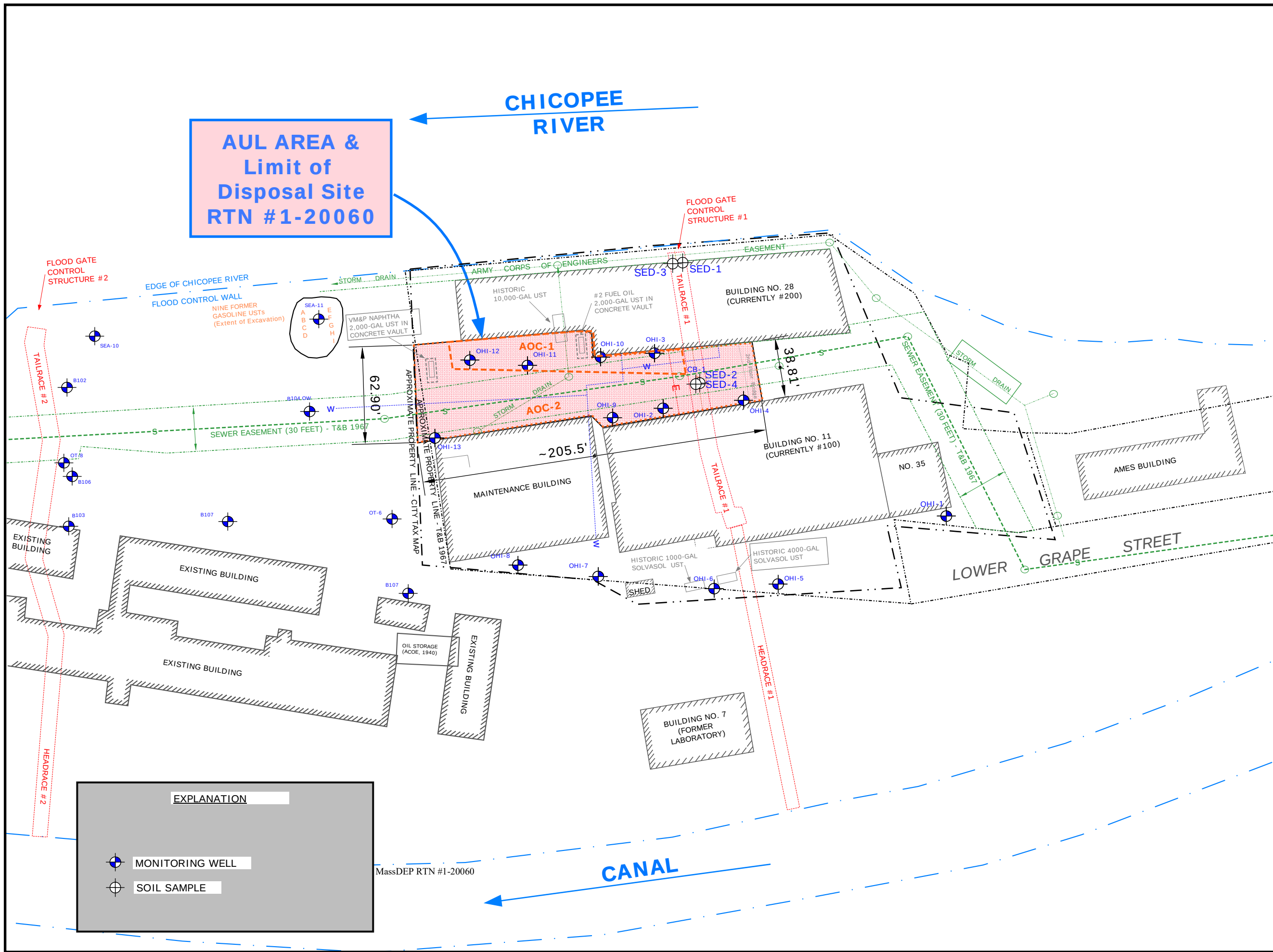
www.ohiengineering.com



NOTE: All locations & dimensions of the Site features & property lines are approximate. This plan should not be used for construction or land conveyance purposes. Vertical & horizontal locations of monitoring points determined by site survey conducted by OHI personnel. Groundwater elevations are based on an assumed benchmark of 100.00 feet located at the center of the garage door. Groundwater contours are based upon measurements collected on 5/25/16. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time of measurement. Groundwater contours & flow directions assume homogenous, isotropic aquifer conditions & horizontal flow. Groundwater contours are interpolated between data points & inferred in other areas.



	Eastern Etching & Mfg. 35 Lower Grape Street Chicopee, MA	Figure 6A Groundwater Flow Plan
Data Source: Field Measurements, Google Earth, Tighe & Bond, 1967 Chicopee Tax Map USACE, 1940		
OHI Job # 15-1700 MassDEP RTN #1-20060		
Rev. Date: April 26, 2018		
 1" = 100'	Latitude 42° 8' 59.72" N Longitude 72° 36' 18.80" W	110 Pulpit Hill Rd Amherst, MA Phone (413) 835-0780 Fax (413) 549-7918
	44 Wood Ave Mansfield, MA Phone (508) 339-3929 Fax (508) 339-3140	www.ohiengineering.com
 OHI Engineering, Inc. Engineers and Environmental Scientists		



	Eastern Etching & Mfg. 35 Lower Grape Street Chicopee, MA		Figure 7 AUL Site Plan	
	Data Source: Field Measurements, Google Earth, Tighe & Bond, 1967 Chicopee Tax Map USACE, 1940		Rev. Date: October 31, 2019	
OHI Job # 15-1700 MassDEP RTN #1-20060		Latitude 42° 8' 59.72" N Longitude 72° 36' 18.80" W		
		110 Pulpit Hill Rd Amherst, MA Phone (413) 835-0780 Fax (413) 549-7918		
		www.ohiengineering.com		
		44 Wood Ave Mansfield, MA Phone (508) 339-3929 Fax (508) 339-3140		

TABLES

Table 2A: Summary of Laboratory Results - Soil
Eastern Etching & Manufacturing, Inc.
35 Lower Grape Street, Chicopee, MA
RTN #1-20060

Parameter	SOIL SAMPLING LOCATIONS - EEM (by OHI) In Sewer Easement Alley Between Buildings														Exposure Point Concentration					MCP - Method 1 Cleanup Standards							
	B-2A-5' 5'	OHI-2 S-2 9-10'	B-3A-4' 4'	OHI-3 S-2 9-10'	B-4A-4' 4'	B-4 S-4 6-8'	B-9-12' 12'	B-10-12' 12'	B-10-5' 5'	B-10-7' 7'	B-11-11' 11'	B-12-12' 12'	B-13-14' 14'	B-13-4' 4'	EPC	EPC > Method S-1 Standards	Detection Frequency	COC	% > Method 1 Standards	S-1 GW-2	S-1 GW-3	S-2 GW-2	S-2 GW-3	S-3 GW-2	S-3 GW-3	UCL	
LOCATION	~20' West of Tailrace #1	~20' West of Tailrace #1	~20' West of Tailrace #1	~20' West of Tailrace #1	~25' East of Tailrace #1	~25' East of Tailrace #1	~70' West of Tailrace #1	~70' West of Tailrace #1	~70' West of Tailrace #1	~70' West of Tailrace #1	~140' West of Tailrace #1	~190' West of Tailrace #1	~230' West of Tailrace #1	~230' West of Tailrace #1	Sewer Easement Alley												
Laboratory Report	1711251	16D0767	1711251	16D0767	1711251	16E0380	1711251	1711251	1711251	1711251	1711251	1711251	1711251	1711251													
Sampling Date	9/26/2017	4/15/2016	9/26/2017	4/15/16	9/26/2017	5/10/2016	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017													
Field Screen Value (ppm)	0	698	4	107	1	6.2	48	69	2	126	347	308	93	0													
MADEP-EPH-04-1.1 (mg/Kg dry)																											
C9-C18 ALIPHATICS	NT	240	NT	4,700	NT	21	210	480	NT	8,700	1000	2,200	20	NT	1952	Yes	9 of 9	Yes	33%	1000	1000	3,000	3,000	5000	5,000	20,000	
C19-C36 ALIPHATICS	NT	31	NT	690	NT	ND (<11)	34	70	NT	950	110	330	25	NT	250	No	8 of 9	No	0%	3000	3000	5,000	5,000	5,000	5,000	20,000	
C11-C22 AROMATICS	NT	100	NT	840	NT	57	65	250	NT	1,300	340	860	14	NT	425	Yes	9 of 9	No	11%	1000	1000	3000	3,000	5000	5,000	10,000	
ACENAPHTHENE	NT	ND (<0.22)	NT	0.32	NT	ND (<0.11)	ND (<0.12)	0.75	NT	3.8	0.65	ND (<0.13)	ND (<0.11)	NT	0.65	No	4 of 9	No	0%	1000	1000	3000	3,000	5000	5,000	10,000	
ACENAPHTHYLENE	NT	ND (<0.22)	NT	ND (<0.27)	NT	ND (<0.11)	ND (<0.12)	ND (<0.27)	NT	ND (<0.12)	ND (<0.12)	ND (<0.13)	ND (<0.11)	NT	0.08	No	0 of 9	No	0%	600	10	600	10	600	10	10,000	
ANTHRACENE	NT	ND (<0.22)	NT	ND (<0.27)	NT	ND (<0.11)	ND (<0.12)	ND (<0.27)	NT	ND (<0.12)	ND (<0.12)	0.55	ND (<0.11)	NT	0.14	No	1 of 9	No	0%	1000	1000	3000	3,000	5000	5,000	10,000	
BENZO(A)ANTHRACENE	NT	ND (<0.22)	NT	0.6	NT	ND (<0.11)	ND (<0.12)	ND (<0.27)	NT	ND (<0.12)	0.4	0.29	ND (<0.11)	NT	0.19	No	3 of 9	No	0%	7	7	40	40	300	300	3,000	
BENZO(A)PYRENE	NT	ND (<0.22)	NT	ND (<0.27)	NT	ND (<0.11)	ND (<0.12)	ND (<0.27)	NT	ND (<0.12)	ND (<0.12)	ND (<0.13)	ND (<0.11)	NT	0.08	No	0 of 9	No	0%	2	2	7	7	30	30	300	
BENZO(B)FLUORANTHENE	NT	ND (<0.22)	NT	ND (<0.27)	NT	ND (<0.11)	ND (<0.12)	ND (<0.27)	NT	ND (<0.12)	0.23	1.1	ND (<0.11)	NT	0.22	No	2 of 9	No	0%	7	7	40	40	300	300	3,000	
BENZO(G,H,I)PERYLENE	NT	ND (<0.22)	NT	ND (<0.27)	NT	ND (<0.11)	ND (<0.12)	ND (<0.27)	NT	ND (<0.12)	ND (<0.12)	ND (<0.13)	ND (<0.11)	NT	0.08	No	0 of 9	No	0%	1000	1000	3000	3,000	5000	5,000	10,000	
BENZO(K)FLUORANTHENE	NT	ND (<0.22)	NT	ND (<0.27)	NT	ND (<0.11)	ND (<0.12)	ND (<0.27)	NT	ND (<0.12)	ND (<0.12)	ND (<0.13)	ND (<0.11)	NT	0.08	No	0 of 9	No	0%	70	70	400	400	3000	3,000	10,000	
CHRYSENE	NT	ND (<0.22)	NT	0.4	NT	ND (<0.11)	ND (<0.12)	ND (<0.27)	NT	ND (<0.12)	0.26	0.36	ND (<0.11)	NT	0.16	No	3 of 9	No	0%	70	70	400	400	3000	3,000	10,000	
DIBENZ(A,H)ANTHRACENE	NT	ND (<0.22)	NT	ND (<0.27)	NT	ND (<0.11)	ND (<0.12)	ND (<0.27)	NT	ND (<0.12)	ND (<0.12)	ND (<0.13)	ND (<0.11)	NT	0.08	No	0 of 9	No	0%	0.7	0.7	4	4	30	30	300	
FLUORANTHENE	NT	ND (<0.22)	NT	ND (<0.27)	NT	0.2	ND (<0.12)	ND (<0.27)	NT	0.42	0.46	0.76	ND (<0.11)	NT	0.26	No	4 of 9	No	0%	1000	1000	3,000	3,000	5000	5,000	10,000	
FLUORENE	NT	ND (<0.22)	NT	ND (<0.27)	NT	ND (<0.11)	0.18	1.4	NT	6.3	1.2	4.1	ND (<0.11)	NT	1.50	No	5 of 9	No	0%	1000	1000	3,000	3,000	5000	5,000	10,000	
INDENO(1,2,3-CD)PYRENE	NT	ND (<0.22)	NT	ND (<0.27)	NT	ND (<0.11)	ND (<0.12)	ND (<0.27)	NT	ND (<0.12)	ND (<0.12)	ND (<0.13)	ND (<0.11)	NT	0.08	No	0 of 9	No	0%	7	7	40	40	300	300	3,000	
2-METHYLNAPHTHALENE	NT	ND (<0.22)	NT	0.74	NT	ND (<0.11)	ND (<0.12)	4.2	NT	4.3	3.2	12	ND (<0.11)	NT	2.75	No	5 of 9	No	0%	80	300	80	500	80	500	5,000	
NAPHTHALENE	NT	ND (<0.22)	NT	0.42	NT	ND (<0.11)	0.27	5.7	NT	3.1	1.8	3.4	ND (<0.11)	NT	1.66	No	6 of 9	No	0%	20	500	20	1,000	20	3,000	10,000	
PHENANTHRENE	NT	ND (<0.22)	NT	ND (<0.27)	NT	0.33	ND (<0.12)	0.87	NT	3.2	1.0	3.1	ND (<0.11)	NT	0.98	No	5 of 9	No	0%	500	500	1000	1,000	3000	3,000	10,000	
PYRENE	NT	ND (<0.22)	NT	ND (<0.27)	NT	0.13	ND (<0.12)	ND (<0.27)	NT	ND (<0.12)	0.32	ND (<0.13)	ND (<0.11)	NT	0.12	No	2 of 9	No	0%	1000	1000	3000	3,000	5000	5,000	10,000	
SW-846 6010C (mg/Kg dry) Metals Digestion																											
ANTIMONY	ND (<2.6)	14	ND (<2.9)	6.2	ND (<2.7)	ND (<2.6)	ND (<2.7)	ND (<3.4)	ND (<2.6)	26	ND (<3)	130	ND (<2.6)	ND (<2.6)	15	Yes	4 of 14	Yes	14%	20	20	30	30	30	30	300	
ARSENIC	3	8	12	ND (<3.2)	11	ND (<2.6)	ND (<2.7)	6.7	ND (<2.6)	5.1	ND (<3)	ND (<3.2)	6.6	2.8	5	No	8 of 14	No	0%	20	20	20	20	50	50	500	
BARIUM	49	62	130	72	98	39	34	39	120	84	66	64	42	53	73	No	14 of 14	No	0%	1000	1000	3000	3,000	5000	5,000	10,000	
BERYLLIUM	ND (<0.26)	0.5	ND (<0.29)	ND (<0.32)	ND (<0.27)	0.33	ND (<0.27)	ND (<0.34)	ND (<0.26)	ND (<0.28)	ND (<0.3)	ND (<0.32)	ND (<0.26)	ND (<0.26)	0.19	No	2 of 14	No	0%	90	90	200	200	200	200	2,000	
CADMIUM	ND (<0.26)	ND (<0.28)	0.96	ND (<0.32)	0.97	1.0	ND (<0.27)	0.58	1.1	0.84	3.3	0.82	ND (<0.26)	0.45	0.82	No	9 of 14	No	0%	70	70	100	100	100	10	1,000	
CHROMIUM	21	31	12	9.8	11	7.9	18	23	23	22	13	15	14	9.0	18	No	14 of 14	No	0%	100	100	200	200	200	200	2,000	
LEAD	31	810	180	110	1000	170	24	34	120	310	230	290	210	59	275	Yes	14 of 14	Yes	43%	200	200	600	600	600	600	6,000	
NICKEL	20	86	32	16	27	11	18	34	14	49	16	26	21	14	30	No	14 of 14	No	0%	600	600	1000	1,000	1,000	1,000	10,000	
SELENIUM	ND (<5.2)	ND (<5.6)	ND (<5.7)	ND (<6.5)	ND (<5.4)	ND (<5.3)	ND (<5.4)	ND (<6.8)	ND (<5.2)	ND (<5.6)	ND (<5.9)	ND (<6.5)	ND (<5.3)	ND (<5.2)	3.06	No	0 of 14	No	0%	400	400	700	700	700	700	7,000	
SILVER	ND (<0.52)	ND (<0.56)	ND (<0.57)	ND (<0.65)	ND (<0.54)	ND (<0.53)	ND (<1.1)	ND (<0.68)	ND (<0.52)	ND (<2.8)	ND (<0.59)	ND (<0.65)	ND (<0.53)	0.55	0.44	No	1 of 14	No	0%	100	100	200	200	200	200	2,000	
THALLIUM	ND (<2.6)	ND (<2.8)	ND (<2.9)	ND (<3.2)	ND (<2.7)	ND (<2.6)	ND (<2.7)	ND (<3.4)	ND (<2.6)	ND (<2.8)	ND (<3)	ND (<3.2)	4.3	3.0	1.89	No	2 of 14	No	0%	8	8	60	60	80	80	800	
VANADIUM	34	48	18	23	20	18	54	16	18	25	20	23	26	16	28	No	14 of 14	No	0%	400	400	700	700	700	700	7,000	
ZINC	67	670	190	99	660	320	33	65	500	200	920	350	99	420	353	No	14 of 14	No	0%	1000	1000	3000	3,000	5000	5,000	10,000	
SW-846 7471B (mg/Kg dry) Metals Digestion																											
MERCURY	0.097	0.38	0.13	0.07	0.064	0.046	ND (<0.029)	0.35	0.22	0.25	0.89	3.1	ND (<0.028)	0.082	0.44	No	12 of 14	No	0%	20	20	30	30	30	30	300	

NOTES:
1. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
2. ND = Not detected above the lab reporting limits shown in parenthesis.
3. NT = Not tested.
4. ~ = No Method 1 Standard or UCL available
6. **RED BOLD** values exceed the Method 1 S-1 Cleanup Standards.
6. **GREY SHADED** values exceed the Method 1 S-2 Cleanup Standards.
7. Semi-Volatile Organic Compounds (SVOCs) by 8270D
8. NR = Not Reported in Draft Laboratory Report, analysis was requested on COC.

Table 2B: Summary of Laboratory Results - Soil
Eastern Etching & Manufacturing, Inc.
35 Lower Grape Street, Chicopee, MA
RTN #1-20060

Parameter	SOIL SAMPLING LOCATIONS - EEM (by OHI) Outside Sewer Easement Alley Between Buildngs							Exposure Point Concentration					MCP - Method 1 Cleanup Standards						
	OHI-1 S-2 7-8'	B-5A-3' 3'	B-5 S-4 7-8'	B-6 S-4 8-10'	B-7A-3' 3'	B-7 S-4 6-8'	B-8-3' 3'	EPC 3' depth	EPC > Method S-1 Standards	Detection Frequency	COC	% > Method 1 Standards	S-1 GW-2	S-1 GW-3	S-2 GW-2	S-2 GW-3	S-3 GW-2	S-3 GW-3	UCL
LOCATION	Upgradient Corner at Grape Street	~20' East of Tailrace #1	~20' East of Tailrace #1	~22' West of Tailrace #1	~120' West of Tailrace #1	~120' West of Tailrace #1	~200' West of Tailrace #1 in Fill												
Laboratory Report	16D0767	17I1251	16E0380	16E0380	17I1251	16E0380	17I1251												
Sampling Date	4/15/2016	9/26/2017	5/10/2016	5/10/2016	9/26/2017	5/10/2016	9/26/2017												
Field Screen Value (ppm)	0	1.7	494	108	1.3	4.3	0												
MADEP-EPH-04-1.1 (mg/Kg dry)																			
C9-C18 ALIPHATICS	ND (<11)	NT	14	ND (<11)	NT	ND (<23)	NT	12	No	1 of 4	No	0%	1000	1000	3,000	3,000	5000	5,000	20,000
C19-C36 ALIPHATICS	ND (<11)	NT	ND (<11)	ND (<11)	NT	53	NT	17	No	1 of 4	No	0%	3000	3000	5,000	5,000	5,000	5,000	20,000
C11-C22 AROMATICS	ND (<11)	NT	ND (<11)	ND (<11)	NT	74	NT	23	No	1 of 4	No	0%	1000	1000	3000	3,000	5000	5,000	10,000
ACENAPHTHENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	ND (<0.23)	NT	0.07	No	0 of 4	No	0%	1000	1000	3000	3,000	5000	5,000	10,000
ACENAPHTHYLENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	ND (<0.23)	NT	0.07	No	0 of 4	No	0%	600	10	600	10	600	10	10,000
ANTHRACENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	ND (<0.23)	NT	0.07	No	0 of 4	No	0%	1000	1000	3000	3,000	5000	5,000	10,000
BENZO(A)ANTHRACENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	0.89	NT	0.26	No	1 of 4	No	0%	7	7	40	40	300	300	3,000
BENZO(A)PYRENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	1.0	NT	0.29	No	1 of 4	No	0%	2	2	7	7	30	30	300
BENZO(B)FLUORANTHENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	1.2	NT	0.34	No	1 of 4	No	0%	7	7	40	40	300	300	3,000
BENZO(G,H,I)PERYLENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	0.65	NT	0.20	No	1 of 4	No	0%	1000	1000	3000	3,000	5000	5,000	10,000
BENZO(K)FLUORANTHENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	0.39	NT	0.14	No	1 of 4	No	0%	70	70	400	400	3000	3,000	10,000
CHRYSENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	1.1	NT	0.32	No	1 of 4	No	0%	70	70	400	400	3000	3,000	10,000
DIBENZ(A,H)ANTHRACENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	ND (<0.23)	NT	0.07	No	0 of 4	No	0%	0.7	0.7	4	4	30	30	300
FLUORANTHENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	1.2	NT	0.34	No	1 of 4	No	0%	1000	1000	3,000	3,000	5000	5,000	10,000
FLUORENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	ND (<0.23)	NT	0.07	No	0 of 4	No	0%	1000	1000	3,000	3,000	5000	5,000	10,000
INDENO(1,2,3-CD)PYRENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	0.65	NT	0.20	No	1 of 4	No	0%	7	7	40	40	300	300	3,000
2-METHYLNAPHTHALENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	ND (<0.23)	NT	0.07	No	0 of 4	No	0%	80	300	80	500	80	500	5,000
NAPHTHALENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	ND (<0.23)	NT	0.07	No	0 of 4	No	0%	20	500	20	1,000	20	3,000	10,000
PHENANTHRENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	0.66	NT	0.21	No	1 of 4	No	0%	500	500	1000	1,000	3000	3,000	10,000
PYRENE	ND (<0.11)	NT	ND (<0.11)	ND (<0.11)	NT	1.7	NT	0.47	No	1 of 4	No	0%	1000	1000	3000	3,000	5000	5,000	10,000
SW-846 6010C (mg/Kg dry) Metals Digestion																			
ANTIMONY	ND (<2.8)	ND (<2.6)	ND (<2.8)	ND (<2.8)	ND (<2.9)	ND (<2.9)	ND (<2.7)	1.39	No	0 of 7	No	0%	20	20	30	30	30	30	300
ARSENIC	ND (<2.8)	ND (<2.6)	ND (<2.8)	ND (<2.8)	5.2	ND (<2.9)	ND (<2.7)	1.93	No	1 of 7	No	0%	20	20	20	20	50	50	500
BARIUM	22	49	32	49	81	56	260	78	No	7 of 7	No	0%	1000	1000	3000	3,000	5000	5,000	10,000
BERYLLIUM	ND (<0.28)	ND (<0.26)	0.6	0.35	ND (<0.29)	0.39	ND (<0.27)	0.27	No	3 of 7	No	0%	90	90	200	200	200	200	2,000
CADMIUM	ND (<0.28)	ND (<0.26)	0.46	0.29	0.51	0.65	0.74	0.42	No	5 of 7	No	0%	70	70	100	100	100	10	1,000
CHROMIUM	8.6	12	17	10	13	14	21	14	No	7 of 7	No	0%	100	100	200	200	200	200	2,000
LEAD	4.4	37	5.6	5.3	110	46	340	78	No	7 of 7	No	14%	200	200	600	600	600	600	6,000
NICKEL	5.5	9.1	19	8.3	17	13	16	13	No	7 of 7	No	0%	600	600	1000	1,000	1,000	1,000	10,000
SELENIUM	ND (<5.6)	ND (<5.3)	ND (<5.5)	ND (<5.5)	ND (<5.8)	ND (<5.7)	ND (<5.4)	2.77	No	0 of 7	No	0%	400	400	700	700	700	700	7,000
SILVER	ND (<0.56)	ND (<0.53)	ND (<0.55)	ND (<0.55)	ND (<0.58)	ND (<0.57)	ND (<0.54)	0.28	No	0 of 7	No	0%	100	100	200	200	200	200	2,000
THALLIUM	ND (<2.8)	ND (<2.6)	ND (<2.8)	ND (<2.8)	ND (<2.9)	ND (<2.9)	ND (<2.7)	1.39	No	0 of 7	No	0%	8	8	60	60	80	80	800
VANADIUM	12	14	33	18	23	27	29	22	No	7 of 7	No	0%	400	400	700	700	700	700	7,000
ZINC	23	45	45	24	110	110	1200	222	No	7 of 7	No	14%	1000	1000	3000	3,000	5000	5,000	10,000
SW-846 7471B (mg/Kg dry) Metals Digestion																			
MERCURY	ND (<0.028)	0.16	ND (<0.025)	0.092	0.18	0.15	1.4	0.29	No	5 of 7	No	0%	20	20	30	30	30	30	300

- NOTES:
1. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
 2. ND = Not detected above the lab reporting limits shown in parenthesis.
 3. NT = Not tested.
 4. ~ = No Method 1 Standard or UCL available
 6. **RED BOLD** values exceed the Method 1 S-1 Cleanup Standards.
 6. **GREY SHADED** values exceed the Method 1 S-2 Cleanup Standards.
 7. Semi-Volatile Organic Compounds (SVOCs) by 8270D
 8. NR = Not Reported in Draft Laboratory Report, analysis was requested on COC.

Table 3: Summary of Laboratory Results - Groundwater
Eastern Etching & Manufacturing, Inc.
35 Lower Grape Street, Chicopee, MA
RTN #1-20060

Parameter	GROUNDWATER SAMPLING LOCATION															MCP - Method 1 Cleanup Standards		
	OHI-1	OHI-2	OHI-3	OHI-4	OHI-5	OHI-6	OHI-7	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	OHI-13	GW-2	GW-3	UCL
Laboratory Report ID	16D0767	16D0767	16D0767															
Sampling Date	4/15/16	4/15/16	4/15/16	5/11/2016	5/11/2016	5/11/2016	5/11/2016	10/3/2017	10/3/2017	10/3/2017	10/3/2017	10/3/2017	10/3/2017	10/3/2017	6/4/2018			
Screen Sample Depth	2-12 Feet	2-12 Feet	2-12 Feet															
SW-846 8015C (mg/L)																		
TPH (C9-C36)	ND (0.20)	0.34	2.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT				
MADEP-EPH-04-1.1 (µg/L)																		
C9-C18 ALIPHATICS	ND (100)	1000	2700	ND (100)	ND (100)	140.000	ND (100)	NT	ND (97)	ND (100)	1000	160	3800	5600	200	5000	50000	100000
C19-C36 ALIPHATICS	ND (100)	230	460	ND (100)	ND (100)	ND (100)	ND (100)	NT	ND (97)	ND (100)	250	140	700	1000	ND (100)	~	50000	100000
C11-C22 AROMATICS	ND (100)	390	710	ND (100)	ND (100)	ND (100)	ND (100)	NT	ND (97)	ND (100)	720	210	1600	1900	280	50000	5000	100000
ACENAPHTHENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9)	ND (2.0)	3.1	ND (1.9)	2.4	4.8	ND (2.0)	~	10000	100000
ACENAPHTHYLENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9)	ND (2.0)	ND (2.0)	ND (1.9)	ND (1.9)	ND (1.9)	4.0	10000	40	100000
ANTHRACENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9)	ND (2.0)	ND (2.0)	ND (1.9)	ND (1.9)	ND (1.9)	ND (2.0)	~	30	600
BENZO(A)ANTHRACENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9) *	ND (2.0) *	ND (2.0) *	ND (1.9) *	ND (1.9) *	ND (1.9) *	ND (2.0) *	~	1000	10000
BENZO(A)PYRENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9) *	ND (2.0) *	ND (2.0) *	ND (1.9) *	ND (1.9) *	ND (1.9) *	ND (2.0) *	~	500	5000
BENZO(B)FLUORANTHENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9) *	ND (2.0) *	ND (2.0) *	ND (1.9) *	ND (1.9) *	ND (1.9) *	ND (2.0) *	~	400	4000
BENZO(G,H,I)PERYLENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9)	ND (2.0)	ND (2.0)	ND (1.9)	ND (1.9)	ND (1.9)	ND (2.0)	~	20	500
BENZO(K)FLUORANTHENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9) *	ND (2.0) *	ND (2.0) *	ND (1.9) *	ND (1.9) *	ND (1.9) *	ND (2.0) *	~	100	1000
CHRYSENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9)	ND (2.0)	ND (2.0)	ND (1.9)	ND (1.9)	ND (1.9)	ND (2.0)	~	70	700
DIBENZ(A,H)ANTHRACENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9) *	ND (2.0) *	ND (2.0) *	ND (1.9) *	ND (1.9) *	ND (1.9) *	ND (2.0) *	~	40	400
FLUORANTHENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9)	ND (2.0)	ND (2.0)	ND (1.9)	ND (1.9)	ND (1.9)	ND (2.0)	~	200	2000
FLUORENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9)	ND (2.0)	4.7	ND (1.9)	3.7	8.9	2.2	~	40	400
INDENO(1,2,3-CD)PYRENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9) *	ND (2.0) *	ND (2.0) *	ND (1.9) *	ND (1.9) *	ND (1.9) *	ND (2.0) *	~	100	1000
2-METHYLNAPHTHALENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9)	ND (2.0)	12	4.9	4.2	8.4	2.6	2000	20000	100000
NAPHTHALENE	ND (2.0)	ND (2.0)	2.7	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9)	ND (2.0)	15	ND (1.9)	3.4	6.6	2.4	700	20000	100000
PHENANTHRENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9)	ND (2.0)	ND (2.0)	ND (1.9)	3.0	3.0	ND (2.0)	~	10000	100000
PYRENE	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	NT	ND (1.9)	ND (2.0)	ND (2.0)	ND (1.9)	ND (1.9)	ND (1.9)	ND (2.0)	~	20	600
SW-846 6020A (µg/L) Metals Digestion																		
ANTIMONY	ND (1.0)	1.2	2.2	2.3	ND (1.0)	ND (1.0)	1.2	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	NT	~	8000	80000
ARSENIC	ND (0.4)	0.56	0.96	3.7	ND (0.40)	ND (0.40)	2.3	ND (0.40)	ND (0.40)	ND (0.40)	1.1	ND (0.40)	0.59	ND (0.40)	NT	~	900	9000
BARIUM	37	65	100	52	44	31	110	47	78	75	180	280	220	110	NT	~	50000	100000
BERYLLIUM	ND (0.4)	ND (0.4)	ND (0.4)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	ND (0.40)	NT	~	200	2000
CADMIUM	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	NT	~	4	50
CHROMIUM	3.2	2.4	ND (1)	20	ND (1.0)	ND (1.0)	11	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	NT	~	300	3000
LEAD	5.1	7.7	1.0	5.2	ND (1.0)	ND (1.0)	54	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	6.6	ND (1.0)	ND (1.0)	NT	~	10	150
NICKEL	ND (5)	ND (5)	ND (5)	ND (5.0)	ND (5.0)	ND (5.0)	12	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	NT	~	200	2000
SELENIUM	ND (5)	ND (5)	ND (5)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	NT	~	100	1000
SILVER	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	1.9	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	NT	~	7	1000
THALLIUM	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.20)	NT	~	3000	30000
VANADIUM	ND (5)	ND (5)	ND (5)	ND (5.0)	ND (5.0)	ND (5.0)	17	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)	NT	~	4000	40000
ZINC	10	25	ND (10)	ND (10)	ND (10)	ND (10)	89	ND (10)	14	ND (10)	ND (10)	50	ND (10)	ND (10)	NT	~	900	50000
SW-846 7470A (mg/L) Metals Digestion																		
MERCURY	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	0.00041	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)	NT	~	0.02	0.2

NOTES:

1. An asterisk (*) following a detection limit indicates that the minimum laboratory reporting limit exceeds one or more of the regulatory criteria.
2. ND = Not detected above the lab reporting limits shown in parenthesis.
3. ~ = No Method 1 Standard or UCL available
4. Shaded values exceed the MCP Reportable Concentrations (RCs).
5. **Bolded** values exceed the Method 1 Cleanup Standards.

Table 4: Groundwater Elevation Data
Eastern Etching & Manufacturing, Inc.
35 Lower Grape Street, Chicopee, MA

		December 9, 2015		May 25, 2016		July 27, 2016		August 4, 2016		October 3, 2017		October 20, 2017	
Well ID	MW Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation	Depth to Water	Water Table Elevation
Canal Level		Full		Full		Empty		Full		Empty		Empty	
MW-1 box	100.00									7.45	92.13		
MW-1 pvc	99.58			7.47	92.11	8.35	91.23	7.58	92.00				
MW-2 pvc	96.38			6.50	89.88	7.59	88.79	7.42	88.96	7.20	89.18	7.49	88.89
MW-3 pvc	95.87			6.01	89.86	7.07	88.80	6.90	88.97	6.67	89.20	6.97	88.90
MW-4 pvc	96.26			7.77	88.49	8.05	88.21	7.94	88.32	7.77	88.49	7.84	88.42
MW-5 pvc	99.49			2.06	97.43	6.57	92.92	4.72	94.77	5.41	94.08		
MW-6 pvc	98.48			2.17	96.31	6.53	91.95	2.99	95.49	5.49	92.99		
MW-7 pvc	98.49			4.16	94.33	7.15	91.34	4.15	94.34	6.37	92.12		
MW-8 pvc	99.00									8.75	90.25		
MW-9 pvc	96.87									7.65	89.22		
MW-10 pvc	96.03									6.85	89.18		
MW-11 pvc	96.20									6.99	89.21		
MW-12 pvc	96.85									7.42	89.43		
MW-13 pvc	97.35									7.94	89.41		
CB-1	95.73	8.02	87.71			9.81	85.92	8.43	87.30	8.41	87.54		87.54

Notes:

Local assumed benchmark is 100.00 feet at road box of MW-1

FULL = Canal contains water.

EMPTY = Canal is dry.

APPENDIX A

Photographs



Photo 1: Sandbags breached by sloughing material. "tailrace" sample collected rear center. 9/28/15



Photo 2: 7/9/15: 4 feet of material in tailrace described as gelatinous, saturated, unstable. Light at rear is reported to be from the CB between EEM buildings, other side of Bldg 28.



Photo 3: One of the 8-inch toe drains where sediment was sampled. 9/28/15



Photo 4: Other of the 8-inch toe drains where sediment was sampled. 9/28/15



Photo 5: 12-inch collector drain coming into the Flood Gate Chamber from the east. 9/28/15



Photo 6: 24-inch collector drain going west toward MH4, MH5, MH6, and tailrace #2 at the Ames building. 9/28/15

Photos this page courtesy of Gardner Const. and GZA.



Photo 7: Material within the Flood Gate Chamber prior to clean out. (GZA/Gardner, 6/8/15).



Photo 8: Catch Basin reported to drain into tailrace #1. (OHI, 11/16/15).



Photo 9: Canal wall showing presumed concrete patch (R) of penstock #1 which fed tailrace #1 until circa 1954 (EEM, 11/19/15).



Photo 10: Close-up of canal wall showing presumed concrete patch of penstock #1 which once fed tailrace #1 (11/19/15).



Photo 11: Brown material is the top layer 3-4" thick within Tailrace #1, and was sampled as SED-2.



Photo 12: Black material is the bottom layer 3-4 feet thick within Tailrace #1, and was sampled as SED-4.



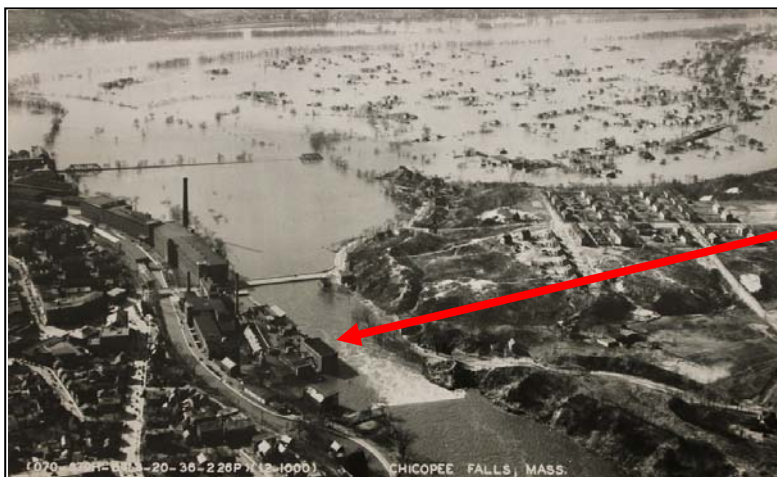
Photos 13 and 14 from Chicopee Memorial Library Archives collection. Photo 15 from US National Archives.

EEM building #28

Photo 13: Flooding over Granby Road, EEM buildings in background across river. Flooding half way up first floor windows. (March 1936)



Photo 14: Flooding at Davitt Memorial Bridge. (March 1936)



EEM building #28

Photo 15: Aerial view of flooding at Chicopee, MA. (March 20, 1936)

APPENDIX B

City of Chicopee 10/23/1940



CITY OF CHICOPEE
MASSACHUSETTS

OFFICE OF THE CITY CLERK

October 23, 1940

ARTHUR BALTHAZAR

CITY CLERK

J. Aime Lavallee
3640 Main Street
Springfield, Massachusetts

Dear Sir:

The following order was passed by the Board of Aldermen on October 23, 1940, and signed by the Mayor on November 7, 1940.

ORDERED That the Mayor and City Treasurer be and are hereby authorized to convey to J. Aime Lavallee, in consideration of Ten thousand dollars (\$10,000) the following described land with one building thereon, known as Building No. 11 of the A. G. Spalding & Bros. plan.

Beginning at a point on the easterly line of land of City of Chicopee, acquired from A. G. Spalding & Bros. and recorded in Hampden County Registry of Deeds, Book 1699, page 61, said point being eighty four and two hundredths (84.02) feet southerly of the northeasterly corner of said land, thence southerly along the easterly line of said land of City of Chicopee one hundred and thirty one and fifteen hundredths (131.15) feet to a point, thence westerly by an included angle of $90^{\circ} 0'$, eleven and twenty five hundredths (11.25) feet to a point, thence southerly by an included angle of $270^{\circ} 12'$ thirty five (35) feet to a point, thence north-westerly by an included angle of $74^{\circ} 31'$ along the land of A. G. Spalding & Bros., two hundred and seventy two and nine hundredths (272.09) feet to a point, thence northerly by an included angle of $105^{\circ} 29'$, along land of said A. G. Spalding & Bros. ninety three (93) feet to a point, thence easterly by an included angle of $90^{\circ} 04'$, along other land of Grantor two hundred and seventy three and sixty hundredths (273.60) feet to the point of beginning.

Containing thirty five thousand six hundred (35,600) square feet of land more or less.

Reserving to the City of Chicopee certain restrictions, restrictions of records concerning buildings and rights of way on above described land and which will be more fully explained in the deed.

Very truly yours,

Arthur Balthazar
City Clerk

J.C.

Witness our hands and seals this twenty-eighth day of December, 1940.

Signed and sealed in the presence of:) Louie W. Howard &Seal
Ray P. Dunning by both) Winifred M. Howard &Seal

Commonwealth of Massachusetts Hampden, ss. Springfield, December 28, 1940. Then personally appeared the above named Louie W. Howard and acknowledged the foregoing instrument to be his free act and deed, before me

Ray P. Dunning Notary Public--My commission expires _____

Rec'd Dec. 28, 1940 and Reg'd from the original

c. 18705
ty of Chicopee
to
A.Lavallee &c
amps \$8.80 &c'd

See
3/79/P 47

The City of Chicopee, a corporation duly established under the laws of Massachusetts and having its usual place of business at Chicopee, Hampden County, Massachusetts, for consideration paid, grants to J. Aime Lavallee and Lucienne D. Lavallee, husband and wife, as tenants by the entirety, both of Springfield, Massachusetts, with WARRANTY COVENANTS, the land with one building thereon, known as Building No. 11 of the A.G. Spalding & Bros, Inc. plan and which is more fully described as follows: Beginning at a point on the Easterly line of land of City of Chicopee, acquired from A. G. Spalding & Bros. Inc. and recorded in Hampden County Registry of Deeds, Book 1699, page 61, said point being eighty four and two hundredths (84.02) feet Southerly of the Northeasterly corner of said land, thence Southerly along the Easterly line of said land of City of Chicopee one hundred and thirty one and fifteen hundredths (131.15) feet to a point, thence Westerly by an included angle of 90° 0', eleven and twenty five hundredths (11.25) feet to a point, thence Southerly by an included angle of 270° 12', thirty five (35) feet to a point, thence Northwesterly by an included angle of 74° 31' along the land of A. G. Spalding & Bros. Inc., two hundred and seventy two and nine hundredths (272.09) feet to a point, thence Northerly by an included angle of 105° 29' along land of said A. G. Spalding & Bros. Inc., ninety three (93) feet to a point, thence Easterly by an included angle of 90° 04' along other land of Grantor two hundred and seventy three and sixty hundredths (273.60) feet to the point of beginning. Containing thirty five thousand, six hundred (35,600) square feet of land more or less. Hereby intending to reserve and reserving to the City of Chicopee, its successors and assigns forever, a right of way on the above described premises thirty (30) feet wide on the Southerly and on the Westerly sides and a right of way ten (10) feet wide on the Northerly side and on the Easterly side, twenty five (25) feet tapering to nothing, which is more fully described as follows: Beginning at a point at the Southerly end of the third course of the land hereinbefore described, said course being thirty five (35) feet long, thence Northwesterly by an included angle of 74° 31' with the said thirty five (35) foot course, two hundred and seventy two and nine hundredths (272.09) feet along land of A. G. Spalding & Bros. Inc. to a point, thence Northerly by an included angle of 105° 29' along land of A. G. Spalding & Bros., ninety three (93) feet to a point, thence Easterly by an included angle of 90° 04' along other land of City of Chicopee, two hundred and seventy three and sixty hundredths (273.60) feet to the Northeasterly corner of land herein conveyed, thence Southerly by an included angle of 89° 54', seventy (70) feet more or less along the first course of land herein conveyed to a point, thence Northwesterly by an included angle of 12° more or less sixty one (61) feet to a point, thence Westerly in a line ten (10) feet Southerly of and parallel to the Northerly line of land herein conveyed two hundred and thirty (230) feet more or less to a point, thence Southerly in a line thirty (30) feet Easterly of and parallel to the Westerly line of land herein conveyed sixty (60) feet more or less to a point, thence Southeasterly in a line thirty (30) feet Northerly of and parallel to the Southerly line of land herein conveyed two hundred and twenty four (224) feet more or less to a point, thence Easterly by an included angle of 195° 17' fifteen and fifty hundredths (15.50) feet to a point, thence Southerly by an included angle of 90° 12', thirty five (35) feet to the point of beginning. Reserving to the said City of Chicopee and its successors or assigns any and all rights, title and interest in buildings Nos. 8-8E and 25 on the plan of the A. G. Spalding & Bros. Inc., and, Further, reserving to the said City of Chicopee the right of access on said property in order to remove, repair or alter the said above mentioned buildings No. 8-8E and 25, and Further, reserving to the said Grantor and its successors or assigns any and all rights, title and interest which the said Grantor has in a certain waterwheel, generator and raceway located upon the property hereby conveyed.

J.M.

Reserving to the Grantor and its successors or assigns for the benefit of the land now owned by the Grantor, the following easements:

(1) An easement over the land hereby conveyed for the purpose of maintaining and operating a waterwheel and generator located upon the property hereby conveyed.

(2) An easement for canal or raceway purposes approximately six feet wide for the free flow of water over, upon and through the premises hereby conveyed for the purpose of carrying water to and from the above-mentioned waterwheel and generator.

Also the right of access on said property in the event the Grantor decides to tear down or remove, alter, repair the said building now housing the aforementioned waterwheel and generator. The granted premises are conveyed subject to;

(1) An easement for the benefit of the City of Chicopee to construct and maintain a retaining wall pursuant to a certain agreement heretofore entered into by the Grantor dated July 25, 1940;

(2) A temporary easement for the benefit of the City of Chicopee and the United States Government for the purpose of transporting, storing and utilizing materials, implements and machinery in the construction of the said retaining wall pursuant to a certain agreement dated July 25, 1940;

(3) Any and all other covenants, easements and restrictions of record at the date of the delivery of this deed.

Reserving to the Grantor all rights in and to the water in the canal adjoining lands of the Grantor. Being a part of the premises conveyed to the City of Chicopee by deed of A. G. Spalding & Bros., Inc., dated August 22, 1940 and recorded in Hampden County Registry of Deeds, August 30, 1940, Book 1698, Page 366. This conveyance is made in accordance with a vote of the Board of Aldermen passed October 23, 1940 and approved by the Mayor November 7, 1940 and a later vote passed December 18, 1940 and approved by the Mayor December 19, 1940 for mortgage.

In Witness Whereof the said City of Chicopee has caused its corporate seal to be hereto affixed and these presents to be signed, acknowledged and delivered in its name and behalf by Leo P. Senecal and Flora LaCroix, its Mayor and Assistant City Treasurer this twenty-eighth day of December in the year one thousand nine hundred and forty.

Signed and sealed in presence of	} City of Chicopee (City Seal)
A.J. Burati to both	
	} Leo P. Senecal,
	} Mayor.
	} Flora LaCroix,
	} Assistant City Treas.

The Commonwealth of Massachusetts. Hampden, ss. Chicopee, Mass. December 28th, 1940. The personally appeared the above named Leo P. Senecal, Mayor, and Flora LaCroix, Assistant City Treasurer, and acknowledged the foregoing instrument to be the free act and deed of the City of Chicopee, before me
Napoleon J. Vigeant Notary Public--My commission expires April 10, 1942.

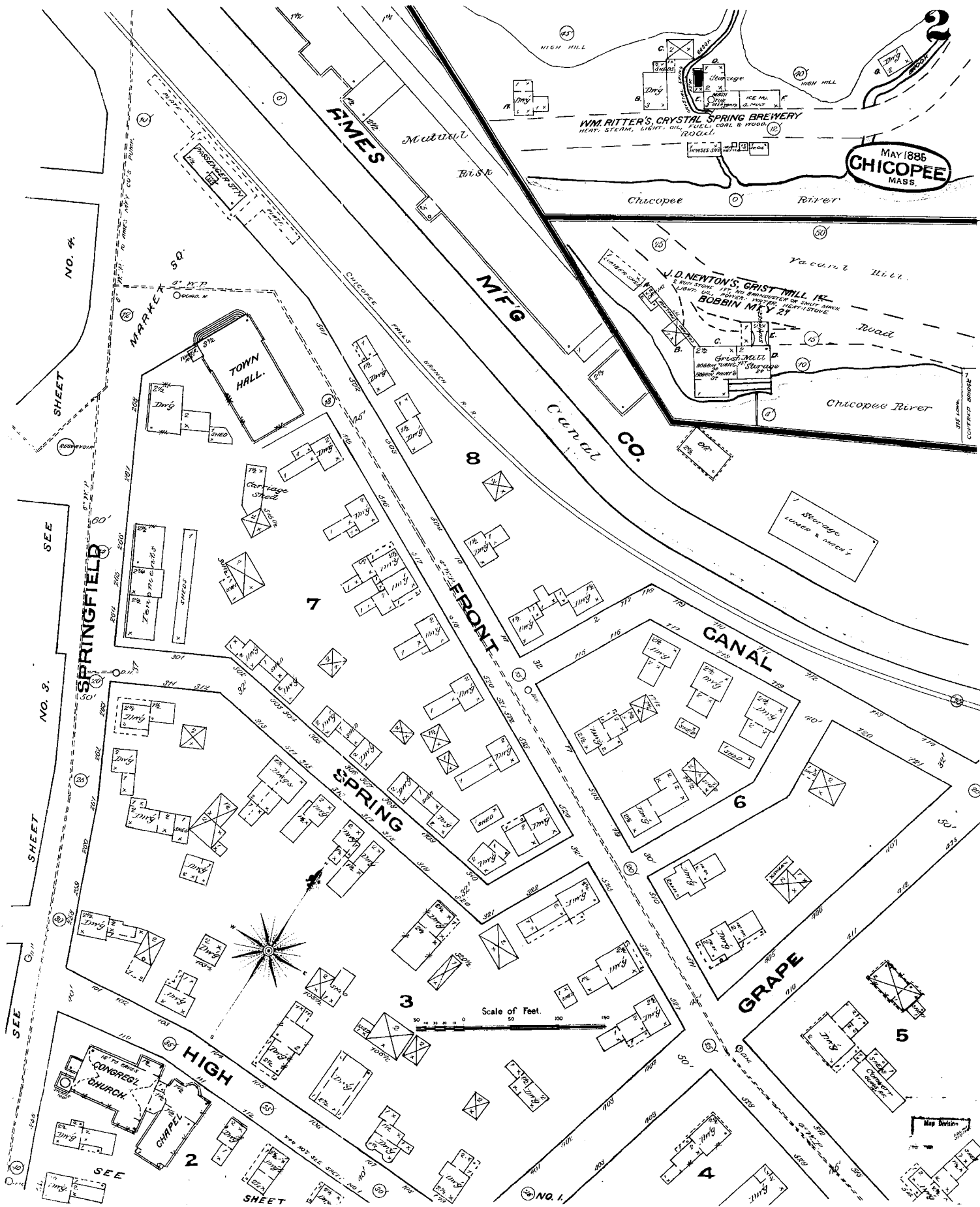
December 28, 1940.

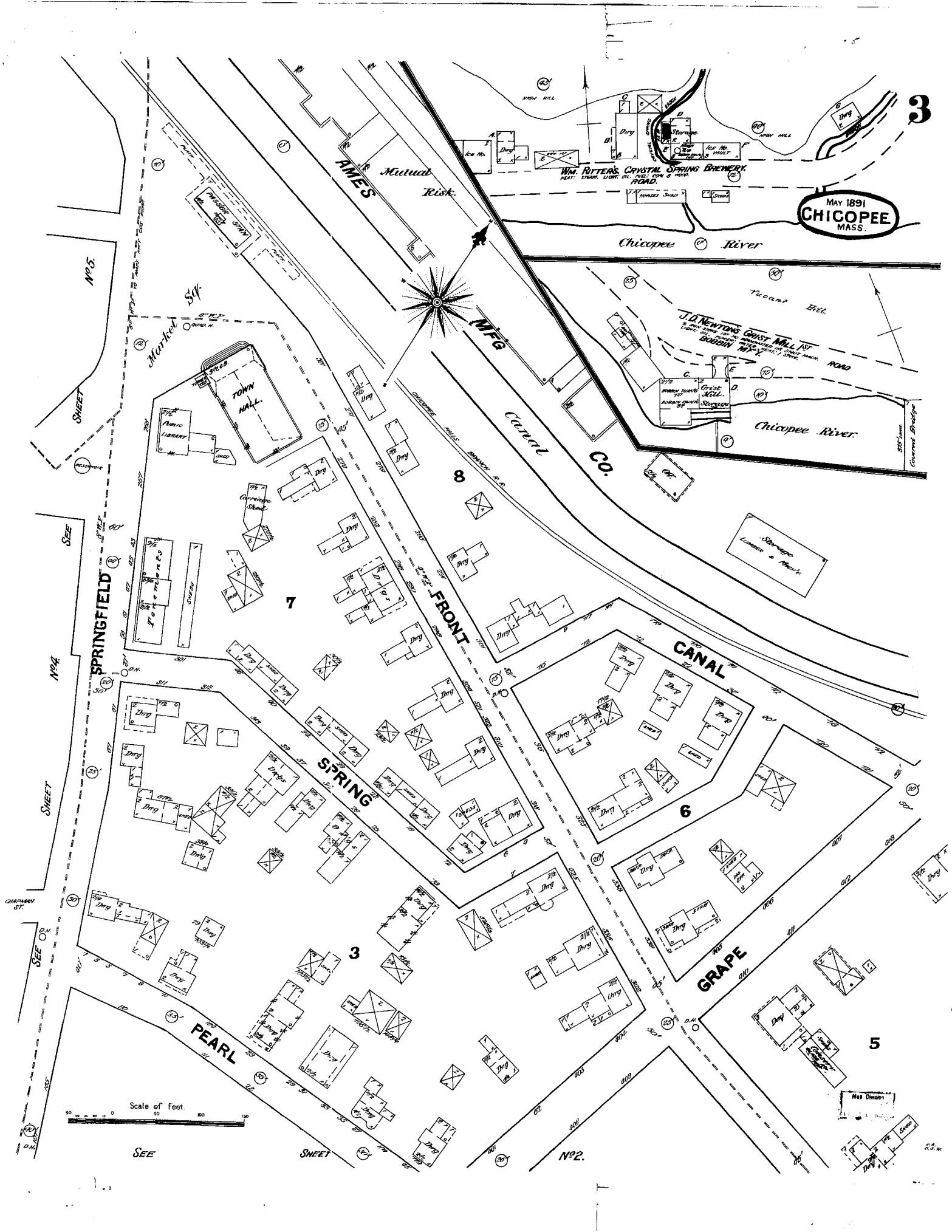
To Whom it May Concern:

This is to certify that the following is a true copy of an order passed by the Board of Aldermen on October 23, 1940, and approved by the Mayor on November 7, 1940: "Ordered that the Mayor and City Treasurer be and are hereby authorized to convey to J. Aime Lavallee, in consideration of Ten Thousand Dollars (\$10,000) the following described land with one building thereon, known as Building No. 11 of the A. G. Spalding & Bros. plan. Beginning at a point on the easterly line of land of City of Chicopee, acquired from A. G. Spalding & Bros. and recorded in Hampden County Registry of Deeds, Book 1699, page 61, said point being eighty-four and two hundredths (84.02) feet southerly of the northeasterly corner of said land, thence southerly along the easterly line of said land of City of Chicopee one hundred and thirty-one and fifteen hundredths (131.15) feet to a point, thence westerly by an included angle of 90° 0', eleven and twenty-five hundredths (11.25) feet to a point, thence southerly by an included angle of 270° 12', thirty-five (35) feet to a point, thence northwesterly by an included angle of 74° 31' along the land of A. G. Spalding & Bros., two hundred and seventy-two and nine hundredths (272.09) feet to a point, thence northerly by an included angle of 105° 29', along land of said A. G. Spalding & Bros. ninety-three (93) feet to a point, thence easterly by an included angle of 90° 04' along other land of Grantor two hundred and seventy-three and sixty hundredths (273.60) feet to the point of beginning. Containing thirty-five thousand six

APPENDIX C

Sanborn & Factory Mutual Maps

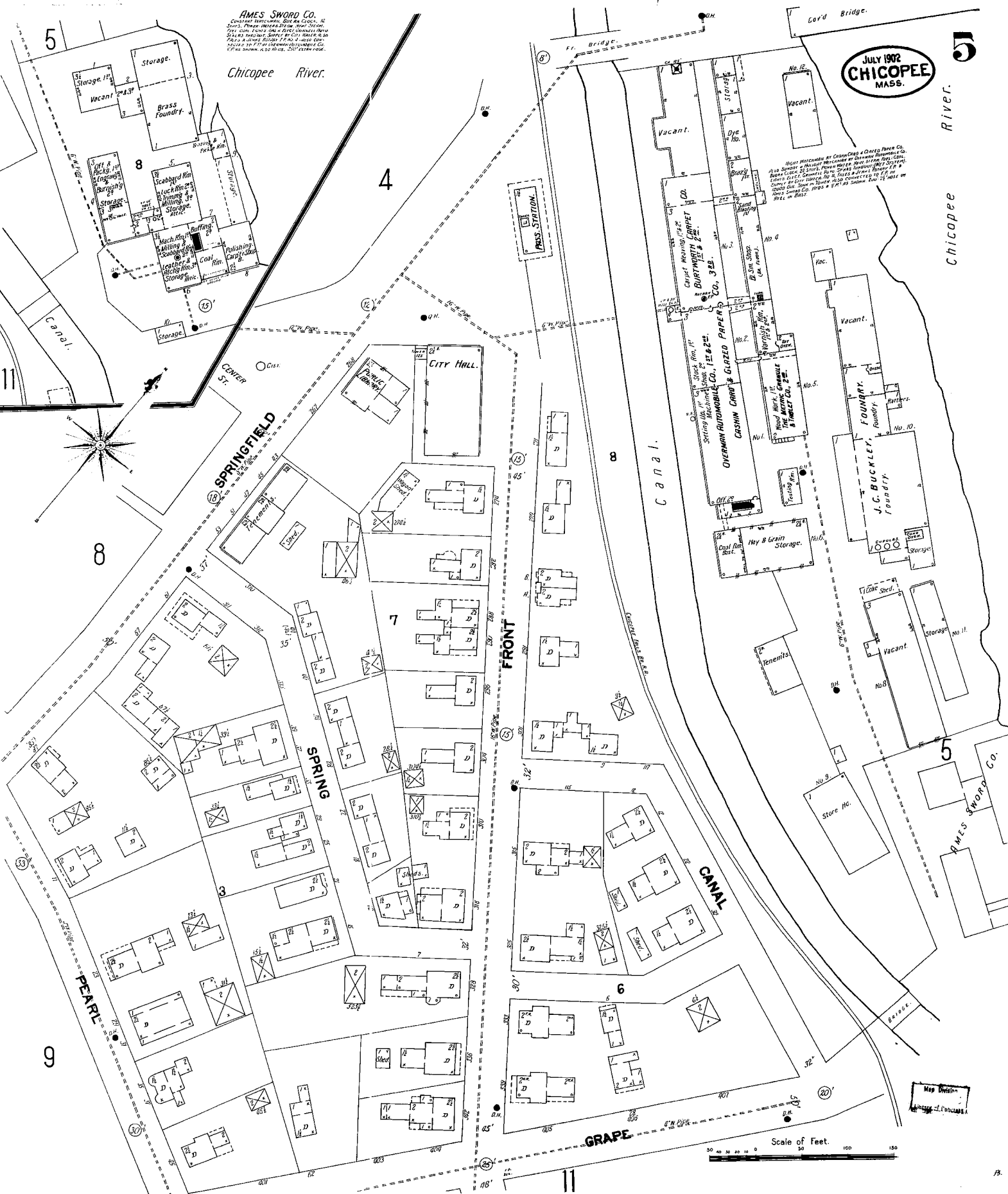


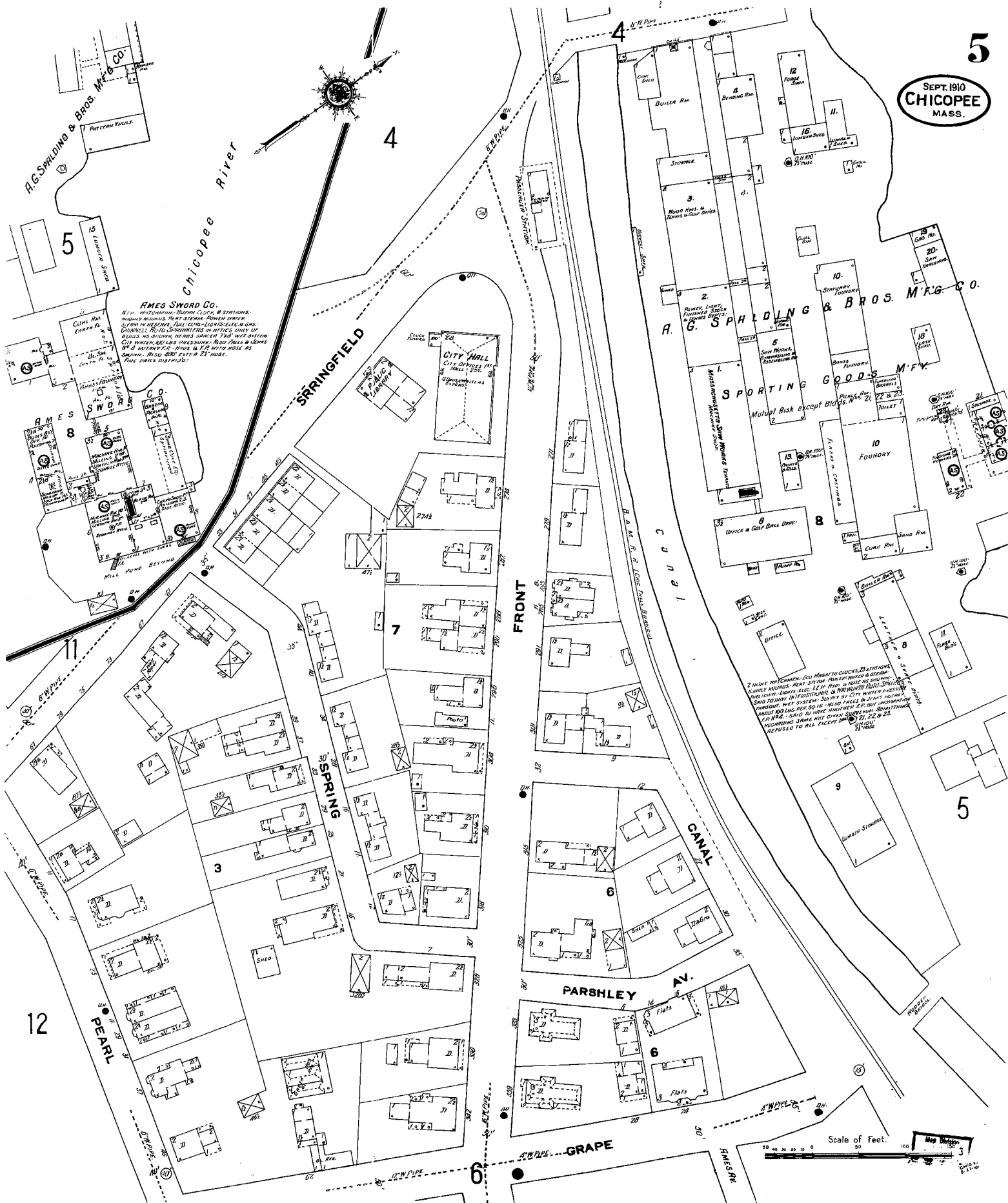


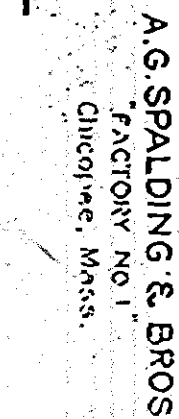
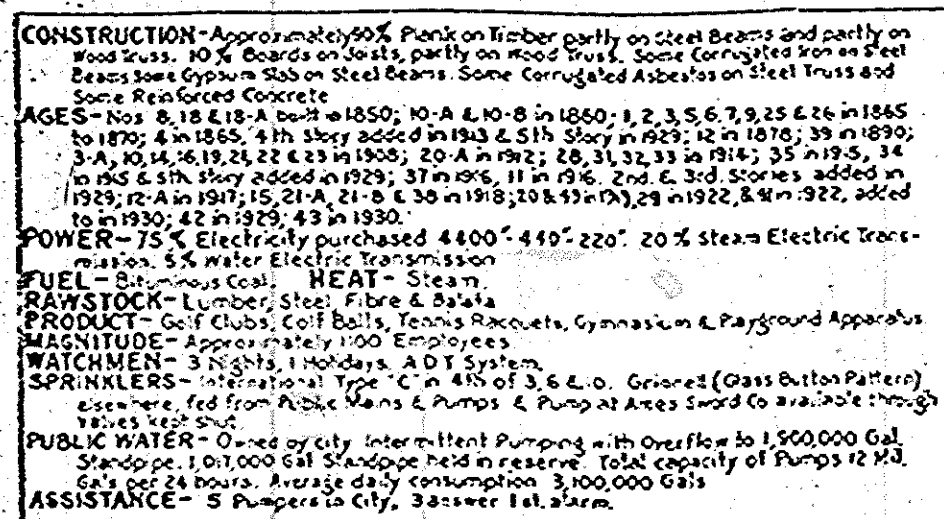
MAY 1891
CHICOPEE
MASS.

Scale of feet.
0 50 100 150

Map Division







10660

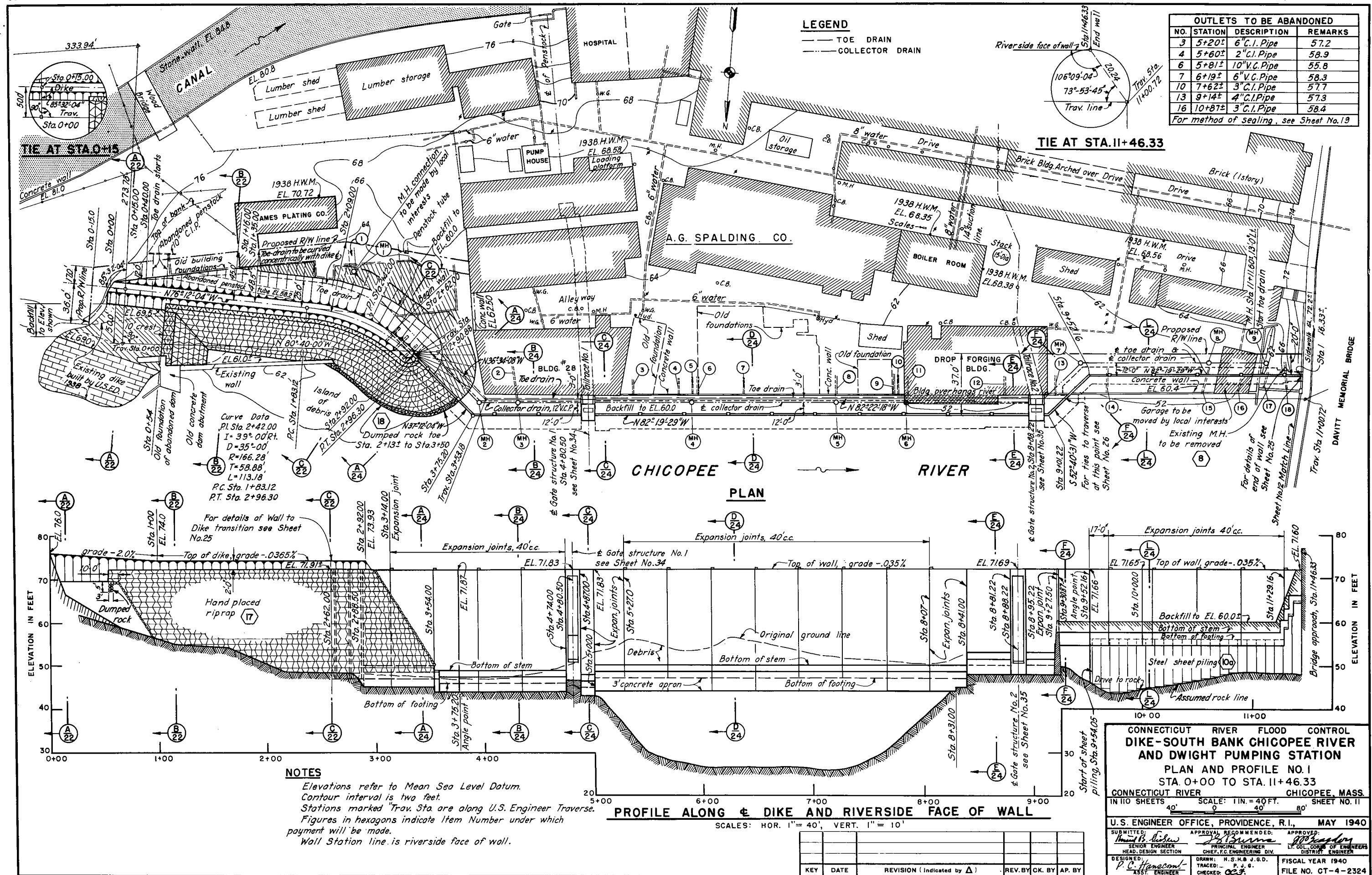
Surveyor No. 147

Tracing No. 2403
By H. A. Lothrop

[illegible]

INDEX NUMBER

10660



1950

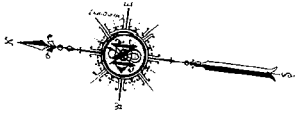
CHICOPEE MASS

MAS 0 031

4
(4)

12

THE AMES PLATING CORP
MFG LODGE REGALIA
NO WATCHMAN - CHENT EATING



Chicopee River

THE AMES PLATING CORP
MFG LODGE REGALIA

NR 9
LUMBER SHED

EASTERN ETCHING & MFG. CO.
METAL WORKING

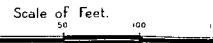
SPALDING REALTY
LOFTS

SPRINGFIELD

SPRINGFIELD

MARKET SQ.

3



Copyright 1966 by the Standard Map Co.

1950

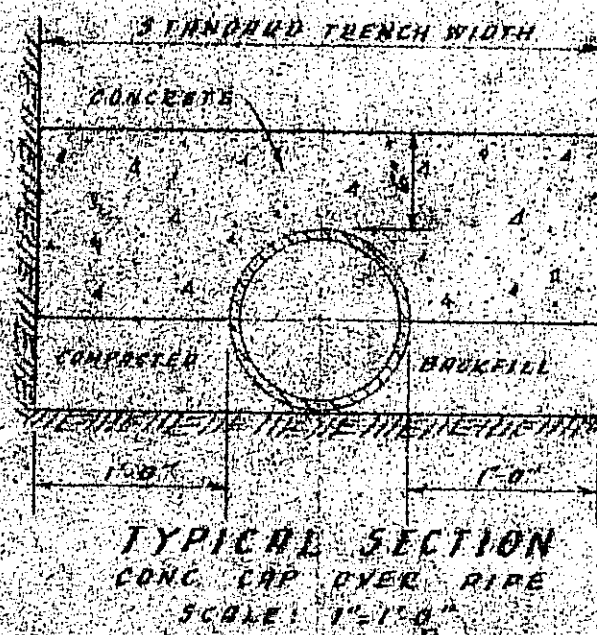
T.B.M. EL. 61.92
HYD. SPINDLE
BOOK NO. 16 PGE NO. 105

NOTE:
FULL UNDERGROUND ROOM
PROVIDE MANHOLE FOR
ELEC. SERVICE

PROPERTY OF
BERNARD M. CROSBY
JAMES R. CROWE

MH-CC-11
STA. 9+88

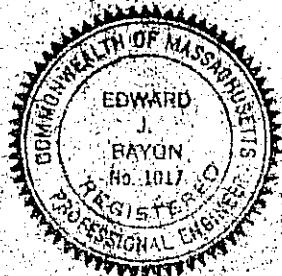
T.B.M. EL. 76.00
TOP OF PILLAR
BK. NO. 16 PGE NO. 104



INDUSTRIAL
FLOW DATA @ M.H. 12
TRIBUTARY AREA = 13.7 ACRES
FUTURE PEAK WET WEATHER FLOW = 136 MGD
PRESENT AVERAGE DRY WEATHER FLOW = 0.43 MGD

AREA
FLOW DATA @ M.H. 13
TRIBUTARY AREA = 16.1 ACRES
FUTURE PEAK WET WEATHER FLOW = 149 MGD
PRESENT AVERAGE DRY WEATHER FLOW = 1.55 MGD

RECORD PLAN



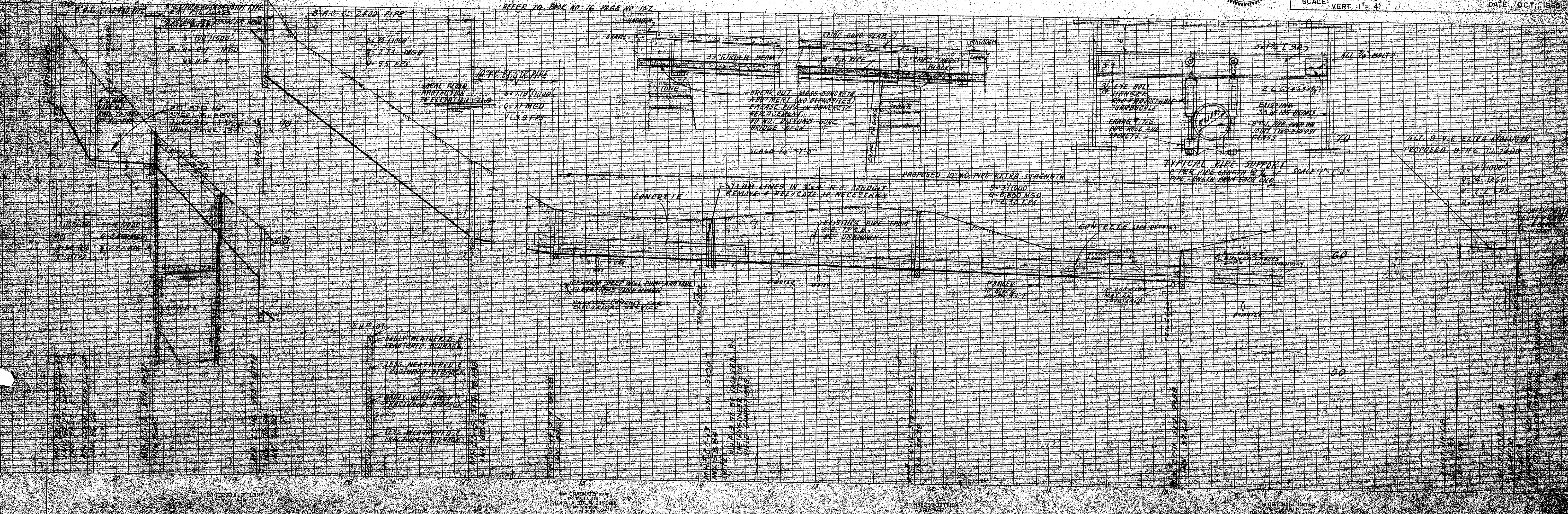
CHICOPEE CENTER INDUSTRIAL AREA
EAST OF PUMPING STATION
STA. 9+00 TO 15+70

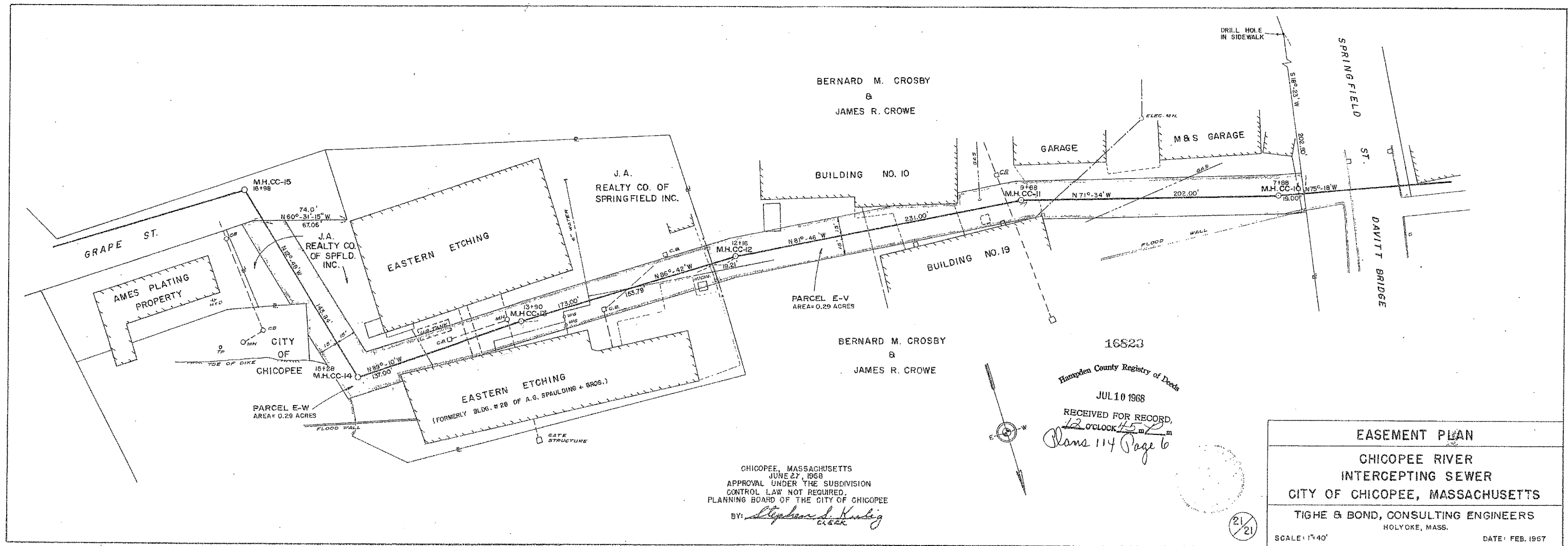
CHICOPEE RIVER
INTERCEPTING SEWER
CITY OF CHICOPEE, MASS

TIGHE & BOND, CONSULTING ENGINEERS
HOLYOKE, MASS

SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

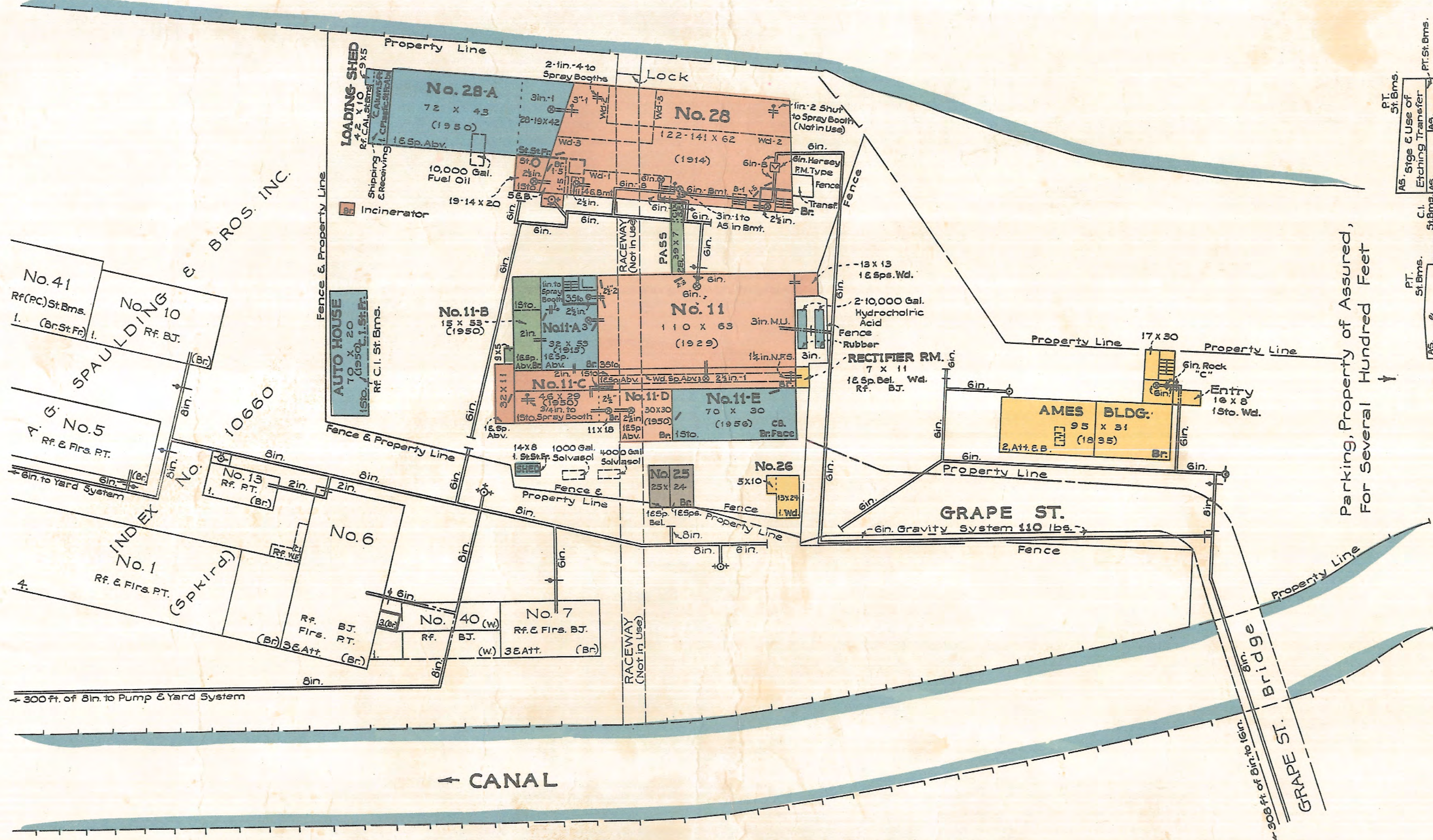
DATE: OCT. 1965





Receiving & Stage of Sheet Metal
C.I. Stktr.
AS. Cor. Ash
St. Fr.
20-A
(St. Cols.)
11-C Etching 11-B
Drying AS.
Paint Shop AS.
C.I. Stktr.

Plant Extends For Several Hundred Feet



Elevator Machinery
AS. Stge. & Use of Etching Transfers
AS. Printing
AS. Inspecting & Shipping
AS. Office
AS. Machine Shop
AS. Maintenance Shop
26.
Raceway (St. Cols. 3-4)

AS.	AS.
AS.	AS. Wd.
AS.	AS. Cartons Wd.
AS.	AS. Stge. As Dies

AMES BLDG.

PT. Stktr.
AS. Stge. & Use of Etching Transfer
AS. Printing
AS. Inspecting
AS. Shipping
AS. Machine Shop
AS. Maintenance Shop
26.
(St. Cols. 3-4)
PASS
11-E Etching 11.
PASS

SHED
St. Stktr. Stge. Paint
25.
Stge. Used Dies
Stge. Windows
Stge. Plumbing & Maintenance Equip.
26.
Drying 11-B 11-A 11.
Raceway
AS. Lithographing
AS. Machine Shop & Punch Presses
AS. Punch Presses
Fib. Bd.
Stge. Office Records
C.I. Stktr.
C.I. Stktr.
Air & Gas Compressor
AS. Boiler
AS. Coating & Dryer
C.I. Stktr.
11-C 11-D 11-E
Raceway
AS. Paint Shop
AS. Paint Shop
C.I. Stktr.

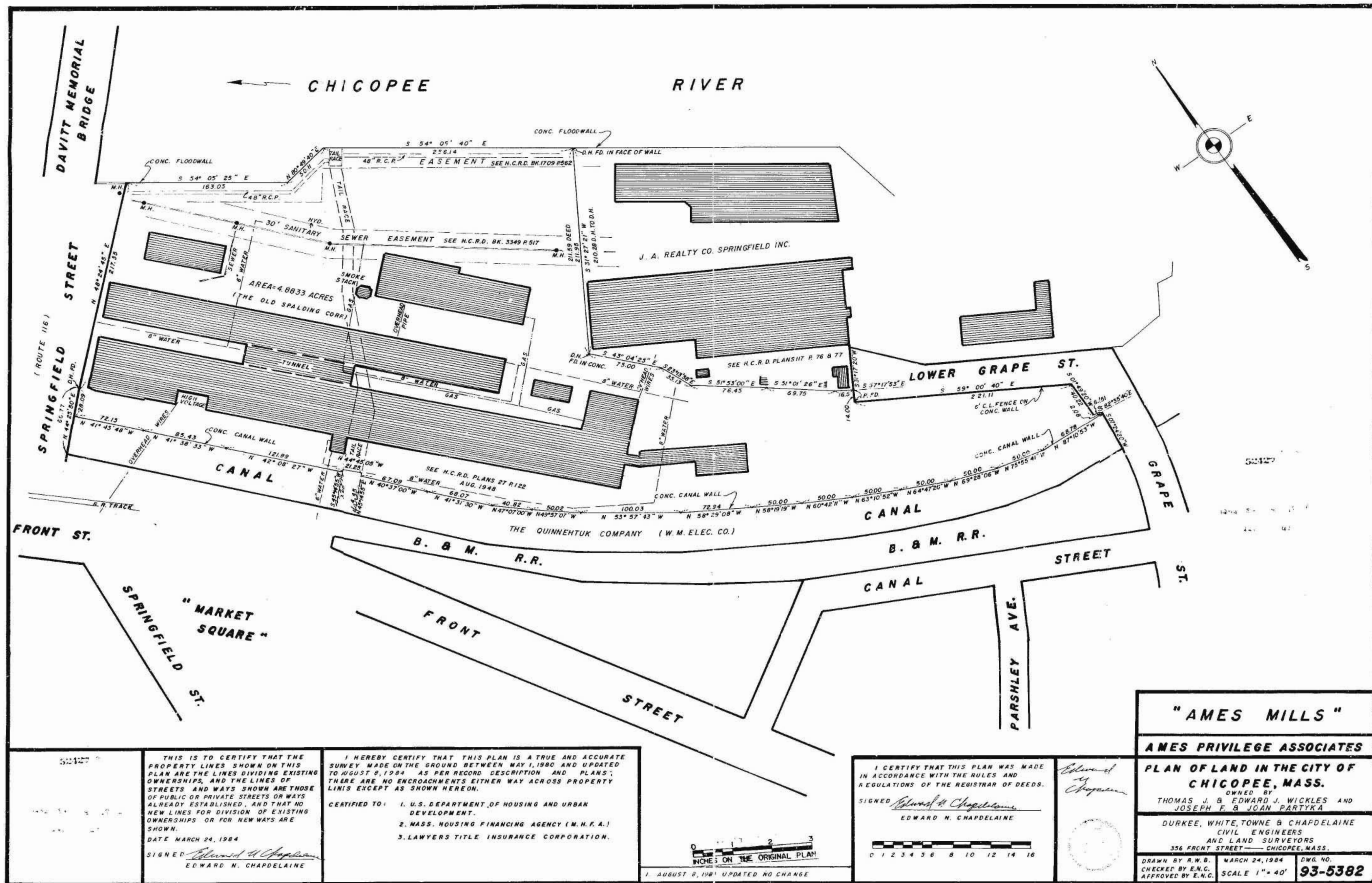
EASTERN ETCHING & MANUFACTURING COMPANY
Chicopee, Mass.

Surveyed 3-28-68
Surveyed By George J. Hughes

Scale 1 in. = 50 ft.
By B. L. Cahoon

FACTORY MUTUAL ENGINEERING DIVISION
Factory Mutual System
Norwood, Mass.

SERIAL 63550
Repl. 34267
INDEX 10661



THIS IS TO CERTIFY THAT THE PROPERTY LINES SHOWN ON THIS PLAN ARE THE LINES DIVIDING EXISTING OWNERSHIPS, AND THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED, AND THAT NO NEW LINES FOR DIVISION OF EXISTING OWNERSHIPS OR FOR NEW WAYS ARE SHOWN.
DATE MARCH 24, 1984
SIGNED *Edward N. Chapdelaine*
EDWARD N. CHAPDELAINE

I HEREBY CERTIFY THAT THIS PLAN IS A TRUE AND ACCURATE SURVEY MADE ON THE GROUND BETWEEN MAY 1, 1980 AND UPDATED TO AUGUST 8, 1984 AS PER RECORD DESCRIPTION AND PLANS; THERE ARE NO ENCROACHMENTS EITHER WAY ACROSS PROPERTY LINES EXCEPT AS SHOWN HEREON.
CERTIFIED TO: 1. U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.
2. MASS. HOUSING FINANCING AGENCY (M.H.F.A.)
3. LAWYERS TITLE INSURANCE CORPORATION.

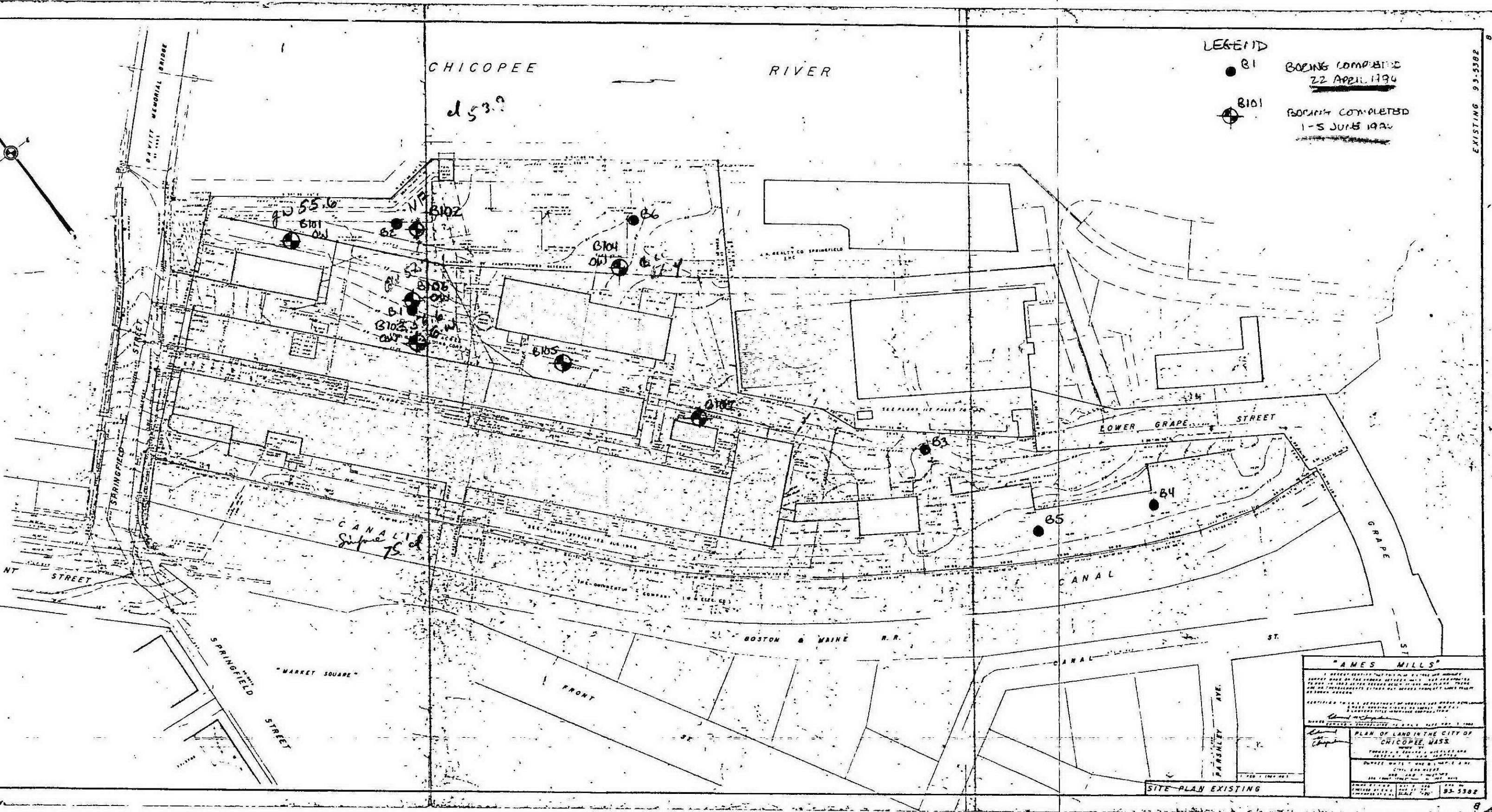
0 1 2 3
INCHES ON THE ORIGINAL PLAN
1. AUGUST 8, 1981 UPDATED NO CHANGE

I CERTIFY THAT THIS PLAN WAS MADE IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE REGISTRAR OF DEEDS.
SIGNED *Edward N. Chapdelaine*
EDWARD N. CHAPDELAINE

0 1 2 3 4 5 6 8 10 12 14 16

"AMES MILLS"
AMES PRIVILEGE ASSOCIATES
PLAN OF LAND IN THE CITY OF CHICOPEE, MASS.
OWNED BY
THOMAS J. & EDWARD J. WICKLES AND JOSEPH F. & JOAN PARTYKA
DURKEE, WHITE, TOWNE & CHAPDELAINE
CIVIL ENGINEERS
AND LAND SURVEYORS
356 FRONT STREET - CHICOPEE, MASS.
DRAWN BY R.W.B. CHECKED BY E.N.C. APPROVED BY E.N.C.
MARCH 24, 1984 SCALE 1" = 40'
DWG. NO. 93-5382

RTN: 11854 Obtained by DEP from Registry on 8/11/99. 11
1984



LEGEND

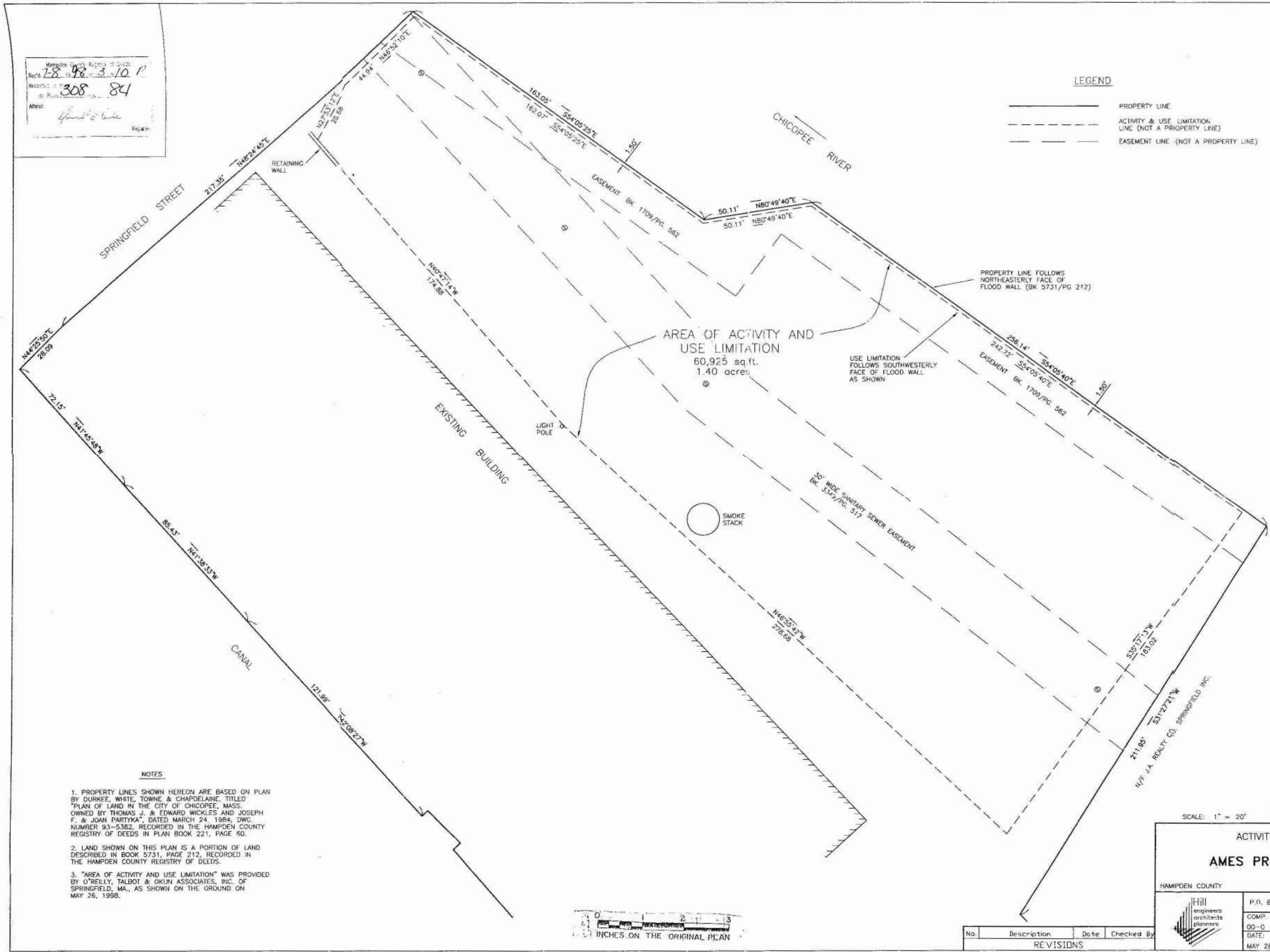
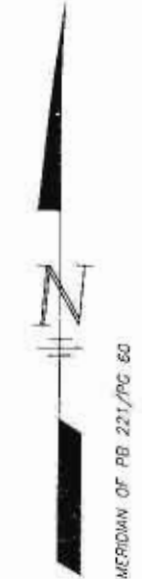
- B1 BOILING COMPARTMENT
22 APRIL 1994
- B101 BOILING COMPARTMENT
1-5 JUNE 1994

"AMES MILLS"	
I HEREBY CERTIFY THAT THIS PLAN IS A TRUE AND CORRECT REPRESENTATION OF THE LAND SHOWN THEREON AND THAT I AM A LICENSED SURVEYOR IN THE STATE OF MASSACHUSETTS.	
CERTIFIED TO BE A REPRESENTATIVE OF THE SURVEYOR AND A LICENSED SURVEYOR IN THE STATE OF MASSACHUSETTS.	
MADE PUBLIC BY DEPOSITING IN THE OFFICE OF THE CLERK OF THE BOARD OF SUPERVISORS OF THE CITY OF CHICOPEE, MASS.	
THOMAS A. D. DAVITT, SURVEYOR CHICOPEE, MASS.	
DATE OF DEPOSIT: 1-5 JUNE 1994	
SCALE: 1" = 100' HORIZ. 1" = 20' VERT.	
DRAWN BY: T. A. DAVITT	
CHECKED BY: T. A. DAVITT	
DATE: 1-5 JUNE 1994	
PROJECT NO.: 93-5382	

Hampden County Registry of Deeds
Rec'd 18 98 3 10 P
RECORDS: 308 84
At Public Sale
Adeit: [Signature]

LEGEND

- PROPERTY LINE
- ACTIVITY & USE LIMITATION LINE (NOT A PROPERTY LINE)
- EASEMENT LINE (NOT A PROPERTY LINE)



SUBJECT TO ANY AND ALL RECORDED OR UNRECORDED RIGHTS-OF-WAY, EASEMENTS, RESTRICTIONS, AND/OR ENCUMBRANCES IN FORCE AND APPLICABLE, IF ANY.

THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

I HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THAT THE PROPERTY LINES SHOWN ARE THE LINES DIVIDING EXISTING OWNERSHIPS, AND THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED, AND THAT NO NEW LINES FOR THE DIVISION OF EXISTING OWNERSHIPS OR FOR NEW WAYS ARE SHOWN. THIS CERTIFICATION IS INTENDED TO MEET REGISTRY OF DEEDS REQUIREMENTS AND IS NOT A CERTIFICATION TO THE TITLE OR OWNERSHIP OF THE PROPERTY SHOWN. OWNERS OF ADJOINING PROPERTIES ARE SHOWN ACCORDING TO THE CURRENT ASSESSORS' RECORDS OF THE CITY OF CHICOPEE.

Douglas W. Thompson
DOUGLAS W. THOMPSON PLS MASS NO.28088



NOTES

1. PROPERTY LINES SHOWN HEREON ARE BASED ON PLAN BY DURKEE, WHITE, TOWNE & CHAPOLAINE, TITLED "PLAN OF LAND IN THE CITY OF CHICOPEE, MASS. OWNED BY THOMAS J. & EDWARD WICKLES AND JOSEPH F. & JOAN PARTYKA", DATED MARCH 24, 1984, DWG. NUMBER 93-5382, RECORDED IN THE HAMPOEN COUNTY REGISTRY OF DEEDS IN PLAN BOOK 221, PAGE 50.
2. LAND SHOWN ON THIS PLAN IS A PORTION OF LAND DESCRIBED IN BOOK 5731, PAGE 212, RECORDED IN THE HAMPOEN COUNTY REGISTRY OF DEEDS.
3. "AREA OF ACTIVITY AND USE LIMITATION" WAS PROVIDED BY O'REILLY, TALBOT & OKUN ASSOCIATES, INC. OF SPRINGFIELD, MA., AS SHOWN ON THE GROUND ON MAY 26, 1998.

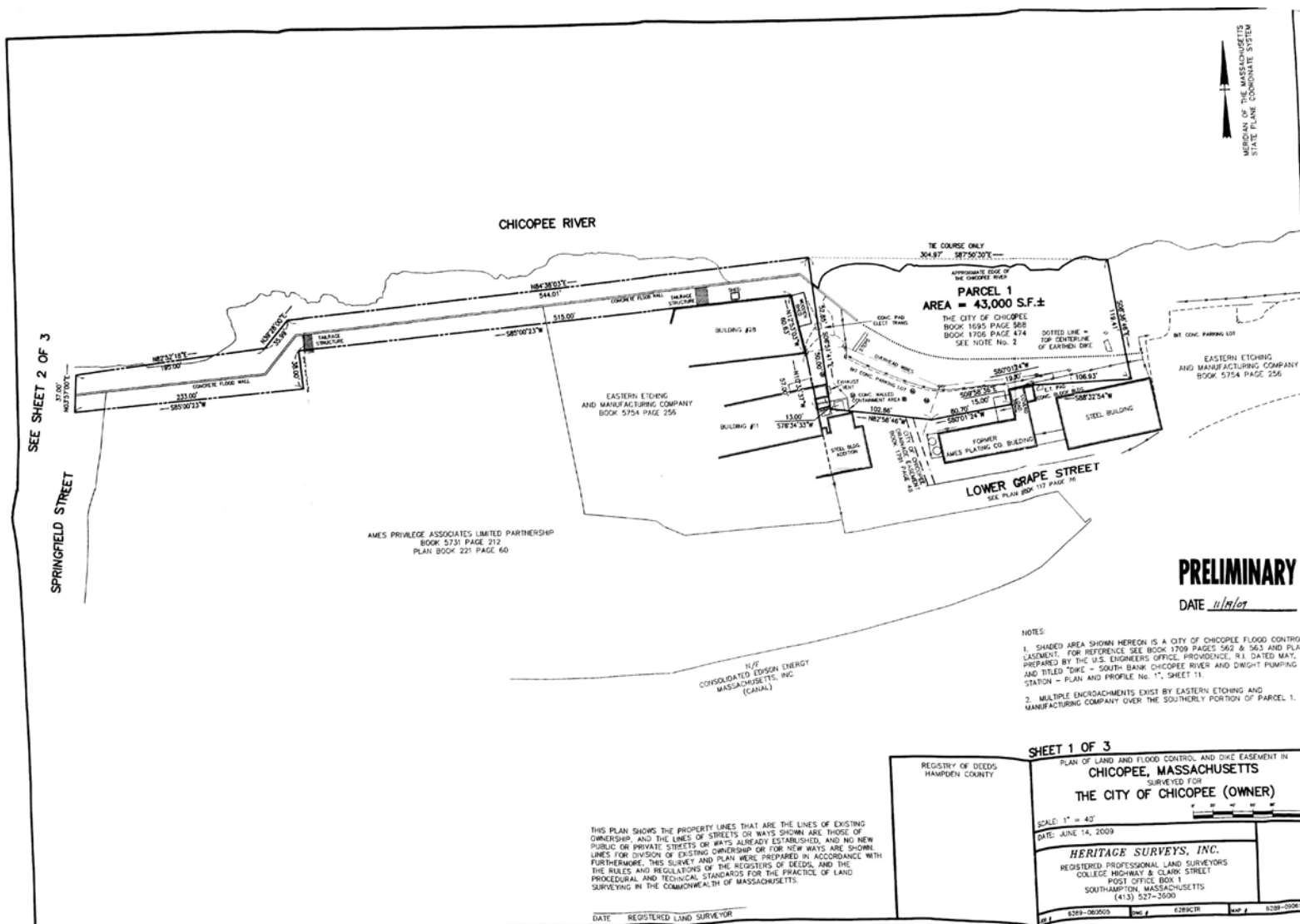
0 1 2 3
INCHES ON THE ORIGINAL PLAN

SCALE: 1" = 20'

ACTIVITY AND USE LIMITATION PLAN FOR AMES PRIVILEGE ASSOCIATES, LLP - OWNER CITY OF CHICOPEE HAMPDEN COUNTY MASSACHUSETTS			
P.O. Box 293 • 50 Depot Street • Dalton, Ma. 01228 • (413)684-0925			
COMP. CODE: 00-0	BOOK NO.: 672	ACAD CODE: WSO-131	DRAWING NO. WSO-131-1
DATE: MAY 28, 1998	DRAWN BY: DMH	CHECKED BY: JLK	REV. 0

No.	Description	Date	Checked By
REVISIONS			

Obtained by DEP from Registry on 8/1/99. LH
RTN: 11854



CHICOPEE RIVER

320'± ALONG EDGE OF CHICOPEE RIVER
TIE COURSE ONLY 304.97' S87°50'30"E

THE CITY OF CHICOPEE
LOT 1

AREA = 38,515 S.F.
(AREA COMPUTED ALONG TIE COURSE AND
INCLUDES ACCESS EASEMENT A)

BOOK 1695 PAGE 588
BOOK 1706 PAGE 474

FLOOD CONTROL EASEMENT
SEE NOTES 3 & 4

EASTERN ETCHING
AND MANUFACTURING COMPANY
BOOK 5754 PAGE 256
BLDG #25

BLDG #25

CITY OF CHICOPEE
INTERCEPTING SEWER EASEMENT
BOOK 3349 PAGE 913
PLAN BOOK 114 PAGE 6

BLDG #11

EASTERN ETCHING
AND MANUFACTURING COMPANY
BOOK 5754 PAGE 256

PROPOSED ACCESS EASEMENT A
SEE NOTE No. 2

LOT 2

LOWER GRAPE STREET
BELIEVED TO BE A CITY LAYOUT

AMES PRIVILEGE ASSOCIATES LIMITED PARTNERSHIP
BOOK 5731 PAGE 212
PLAN BOOK 221 PAGE 60

PLANNING BOARD
CHICOPEE, MA
APPROVAL UNDER SUBDIVISION
CONTROL LAW NOT REQUIRED

DATE

THIS SURVEY AND PLAN WERE PREPARED IN ACCORDANCE WITH THE
RULES AND REGULATIONS OF THE REGISTERS OF DEEDS AND THE
PROCEDURAL AND TECHNICAL STANDARDS FOR THE PRACTICE OF LAND
SURVEYING IN THE COMMONWEALTH OF MASSACHUSETTS

DATE REGISTERED LAND SURVEYOR

REGISTRY OF DEEDS
HAMDEN COUNTY

PLAN OF LAND IN
CHICOPEE, MASSACHUSETTS
SURVEYED FOR
THE CITY OF CHICOPEE

SCALE 1" = 20'

DATE MARCH 21 2012

HERITAGE SURVEYS, INC.
REGISTERED PROFESSIONAL LAND SURVEYORS
COLLIER HIGHWAY & CLARK STREET
POST OFFICE BOX 1
SOUTHAMPTON, MASSACHUSETTS
(413) 527-3600

6289-110329 ENC 62890763 MAP 6289-12001

PRELIMINARY

NOTES

1. LOT 1, HAVING AN AREA OF 38,515 S.F.± AND LOT 2, HAVING AN AREA OF 4,989 S.F.± ARE CURRENTLY OWNED BY THE CITY OF CHICOPEE. REFERENCE SEE BOOK 1706 PAGE 474 AND BOOK 1695 PAGE 588.

2. LOT 2 IS TO BE CONVEYED BY THE CITY OF CHICOPEE TO EASTERN ETCHING AND MANUFACTURING COMPANY AND INCORPORATED WITH THE CITY OF CHICOPEE. PROPOSED ACCESS EASEMENT A IS TO BE CONVEYED BY THE CITY OF CHICOPEE TO EASTERN ETCHING AND MANUFACTURING COMPANY. ACCESS EASEMENT B IS TO BE CONVEYED BY EASTERN ETCHING AND MANUFACTURING COMPANY TO THE CITY OF CHICOPEE. ACCESS EASEMENT A HAS AN AREA OF 970 S.F.± AND ACCESS EASEMENT B HAS AN AREA OF 5,376 S.F.±.

3. FOR REFERENCE TO CITY OF CHICOPEE FLOOD CONTROL EASEMENT SEE BOOK 1709 PAGES 562 & 563 AND PLANS PREPARED BY THE U.S. ARMY CORPS OF ENGINEERS, PROVIDENCE, R.I. DATED MAY, 1940 AND TITLED "BANK OF CHICOPEE RIVER AND DWIGHT PUMPING STATION - PROFILE NO. 1 THROUGH 47, SHEETS 11 THROUGH 14".

4. FLOODWALL AND LEVEE BASELINE SHOWN IS TAKEN FROM THE ADJACENT REFERENCED PLAN AND IS INTENDED TO RUN ALONG THE RIVER SIDE OF FLOODWALL AND THE CENTERLINE OF THE EARTHEN LEVEE. NO VERIFICATION OF BASELINES WAS FOUND AND BASELINES ARE HEREBY ESTABLISHED.

APPENDIX D

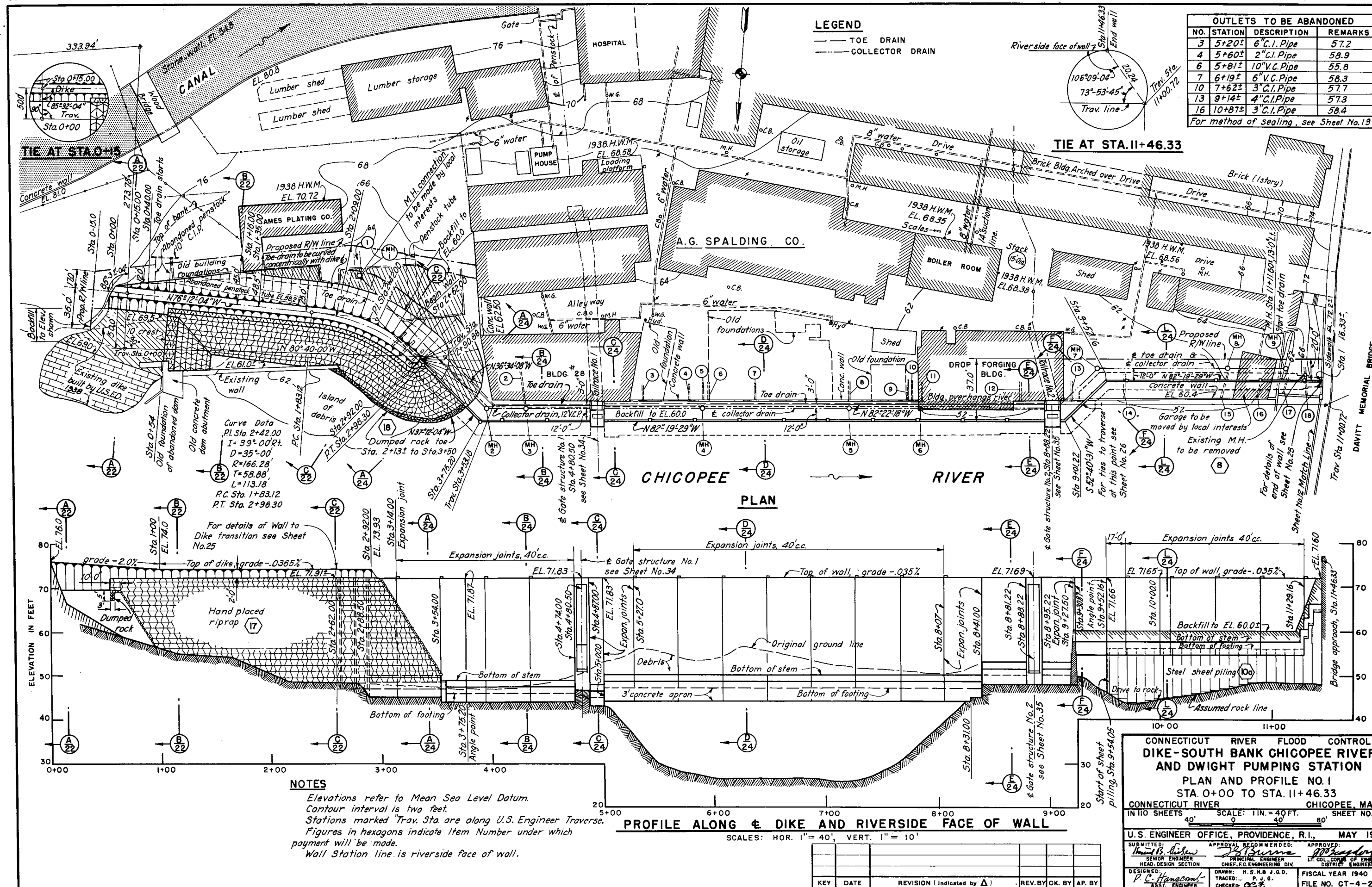
Army Corps of Engineers Plans

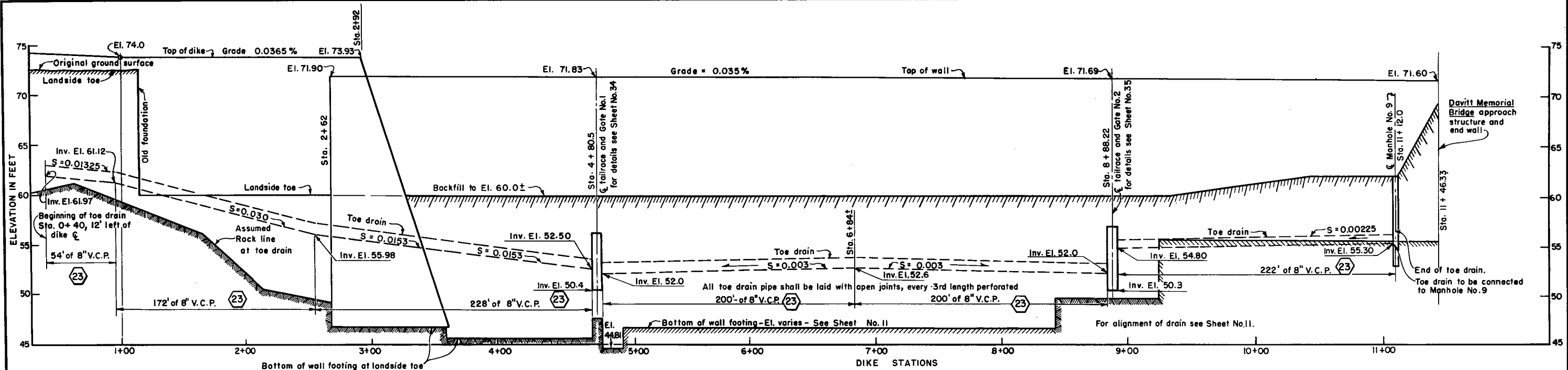
LEGEND

— TOE DRAIN
 --- COLLECTOR DRAIN

OUTLETS TO BE ABANDONED			
NO.	STATION	DESCRIPTION	REMARKS
3	5+20±	6" C.I. Pipe	57.2
4	5+60±	2" C.I. Pipe	58.9
6	5+81±	10" V.C. Pipe	55.8
7	6+19±	6" V.C. Pipe	58.3
10	7+62±	3" C.I. Pipe	57.7
13	9+14±	4" C.I. Pipe	57.3
16	10+87±	3" C.I. Pipe	58.4

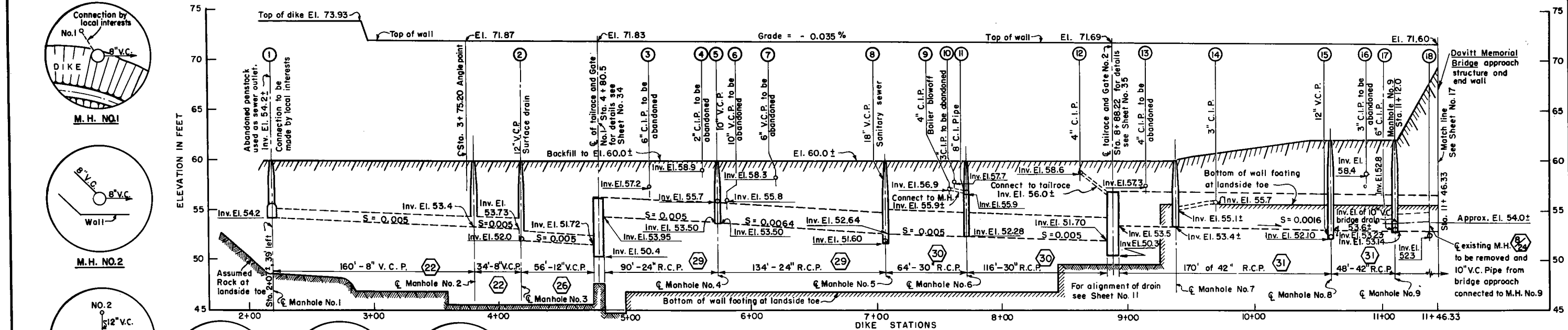
For method of sealing, see Sheet No. 19





PROFILE TOE DRAIN

SCALE: HORIZ. 1"=40'
VERT. 1"=5'



PROFILE COLLECTOR DRAIN

SCALE: HORIZ. 1"=40'
VERT. 1"=5'

NOTES
Elevations refer to Mean Sea Level Datum
Figures in hexagons indicate item number under which payment will be made.
In profile, drain lines shown are invert of pipe
For continuation of table of "Existing Outlets" see Sheet No. 17

EXISTING OUTLETS INTO CHICOPEE RIVER				
NO.	STATION	DESCRIPTION	APPROX. INV. EL.	DISPOSITION
1	2+07.39	Old penstock	54.2	Connect to Manhole No.1 by local interests
2	4+18.12	12" V.C.P.	52.0	Connect to M.H. No.3 - Type "A" connection
3	5+20.1	6" C.I.P.	57.2	To be abandoned
4	5+60.1	2" C.I.P.	58.9	do
5	5+74.1	10" V.C.P.	55.7	Connect to M.H. No.4 - Type "A" connection
6	5+81.1	10" V.C.P.	55.8	To be abandoned
7	6+19.1	6" V.C.P.	58.3	do
8	7+07.1	18" V.C.P.	51.6	Connect to M.H. No.5 - Type "A" connection
9	7+59.1	4" C.I.P.	56.9	Connect to M.H. No.6 - Type "B" connection
10	7+62.1	3" C.I.P.	57.7	To be abandoned
11	7+71.1	8" C.I.P.	55.9	Connect to M.H. No.6 - Type "A" connection
12	8+61.1	4" C.I.P.	58.6	Connect to No.2 gate structure
13	9+14.1	4" C.I.P.	57.3	To be abandoned
14	9+70.1	3" C.I.P.	55.7	Connect to M.H. No.7 - Type "B" connection
15	10+60.1	12" V.C.P.	52.1	Connect to M.H. No.8 - Type "A" connection
16	10+87.1	3" C.I.P.	58.4	To be abandoned
17	11+12.1	6" C.I.P.	52.8	Connect to M.H. No.9 - Type "A" connection
18	11+38.1	10" C.I.P.	52.3	Connect to M.H. No.9

Note: For connection details see Sheet No. 19

KEY

DATE

REVISION (Indicated by Δ)

REV. BY

CK. BY

AP. BY

CONNECTICUT RIVER FLOOD CONTROL

DIKE - SOUTH BANK CHICOPEE RIVER

AND DWIGHT PUMPING STATION

TOE DRAIN AND COLLECTOR NO. 1

STA. 0+00 TO STA. 11+46.33

CONNECTICUT RIVER CHICOPEE, MASS.

IN 110 SHEETS SCALE AS SHOWN SHEET NO. 16

U.S. ENGINEER OFFICE, PROVIDENCE, R.I., MAY 1940

SUBMITTED: *[Signature]* APPROVAL RECOMMENDED: *[Signature]* APPROVED: *[Signature]*

HEAD DESIGN SECTION PRINCIPAL ENGINEER LT. COL. CORPS OF ENGINEERS

DESIGNED: *[Signature]* DRAWN: J.G.D. TRACED: C.J.M. CHECKED: *[Signature]* FISCAL YEAR 1940

ASST. ENGINEER FILE NO. CT-4-2329



Diagram of a manhole structure showing layers: 14 Screened gravel, 23 V.C. pipe, every third length perforated, open joints. Dimensions: 5'-0" top width, 2'-0" bottom width, 3'-0" height, 6" base. Note: Elev. varies.



TYPICAL TOE DRAIN SECTION

SCALE $\frac{1}{2}'' = 1'-0''$

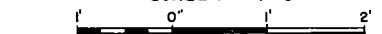


TYPICAL FOR MANHOLES NO.1 TO 10 INCL. & 12 TO 19 INCL.

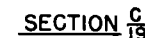


18 REQUIRED TOTAL WEIGHT = 5400 LBS.

SCALE 1" = 1'-0"



SCALE $\frac{1''}{8} = 1'-0''$



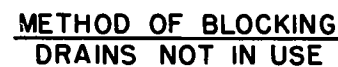
C.I. MANHOLE STEP-TYPE "B"

197 REQUIRED TOTAL WEIGHT = 2364 LBS.

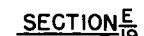
SCALE $1\frac{1}{2}'' = 1'-0''$



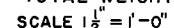
SCALE $\frac{1}{2}'' = 1'-0''$



SCALE $\frac{3}{4}'' = 1'-0''$



SCALE $\frac{1}{2}'' = 1' - 0''$

STANDARD C.I. BOX STEP-TYPE "A" 48

53 REQUIRED TOTAL WEIGHT=2968 LBS.

SCALE $1\frac{1}{2}'' = 1'-0''$

KEY	DATE	REVISION (Indicated by Δ)	REV. BY	CK. BY	AP. B

NOTES

Elevations refer to Mean Sea Level Datum.
Figures in hexagons indicate item numbers
under which payment will be made.
For toe drain alignment see Sheet Nos. 11, 12, 13 & 14.
For drainage system profile see Sheets
No. 17, 18 & 19.

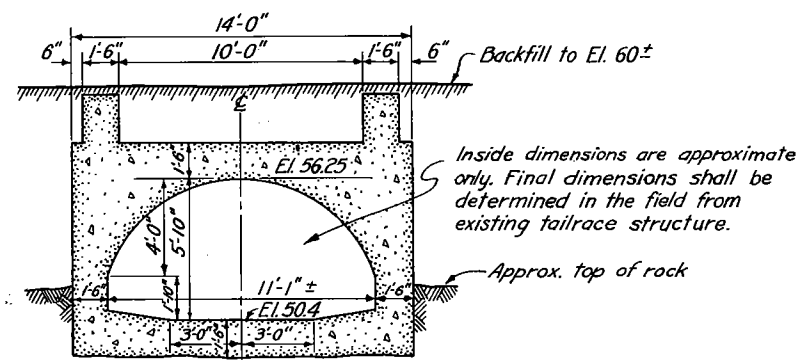
CONNECTICUT RIVER FLOOD CONTROL
DIKE-SOUTH BANK CHICOPEE RIVER
AND DWIGHT PUMPING STATION

DRAINAGE DETAILS NO. 1

CONNECTICUT RIVER CHICOPEE, MASS.
 IN 110 SHEETS SCALE: 1/2" = 1 FT. SHEET NO. 19

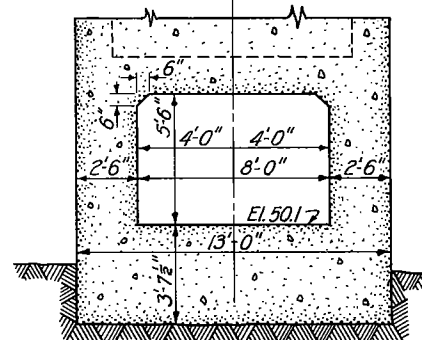
U.S. ENGINEER OFFICE, PROVIDENCE, R.I., MAY 1940

SUBMITTED: <i>P.C. Hancock</i> SENIOR ENGINEER HEAD, DESIGN SECTION	APPROVAL RECOMMENDED: <i>P.C. Hancock</i> PRINCIPAL ENGINEER CHIEF, C.E. ENGINEERING DIV.	APPROVED: <i>P.C. Hancock</i> COL. COMMANDER OF ENGINEERS DISTRICT ENGINEER
DESIGNED: <i>P.C. Hancock</i> SENIOR ENGINEER	DRAWN: J.D.B. & E.E. TRACED: R.S.S. CHECKED: _____	FISCAL YEAR 1940 FILE NO. CT-4-2332



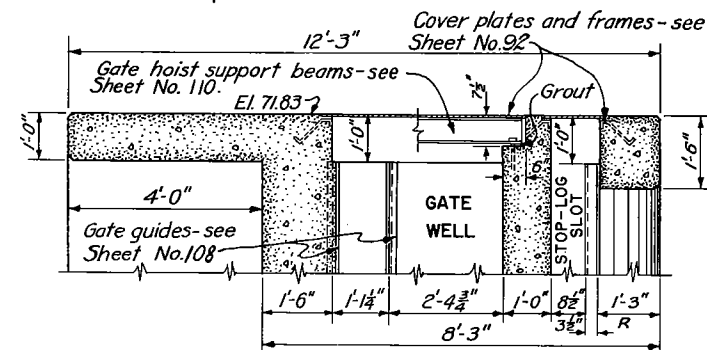
SECTION B
34

SCALE $\frac{1}{4}'' = 1'-0''$



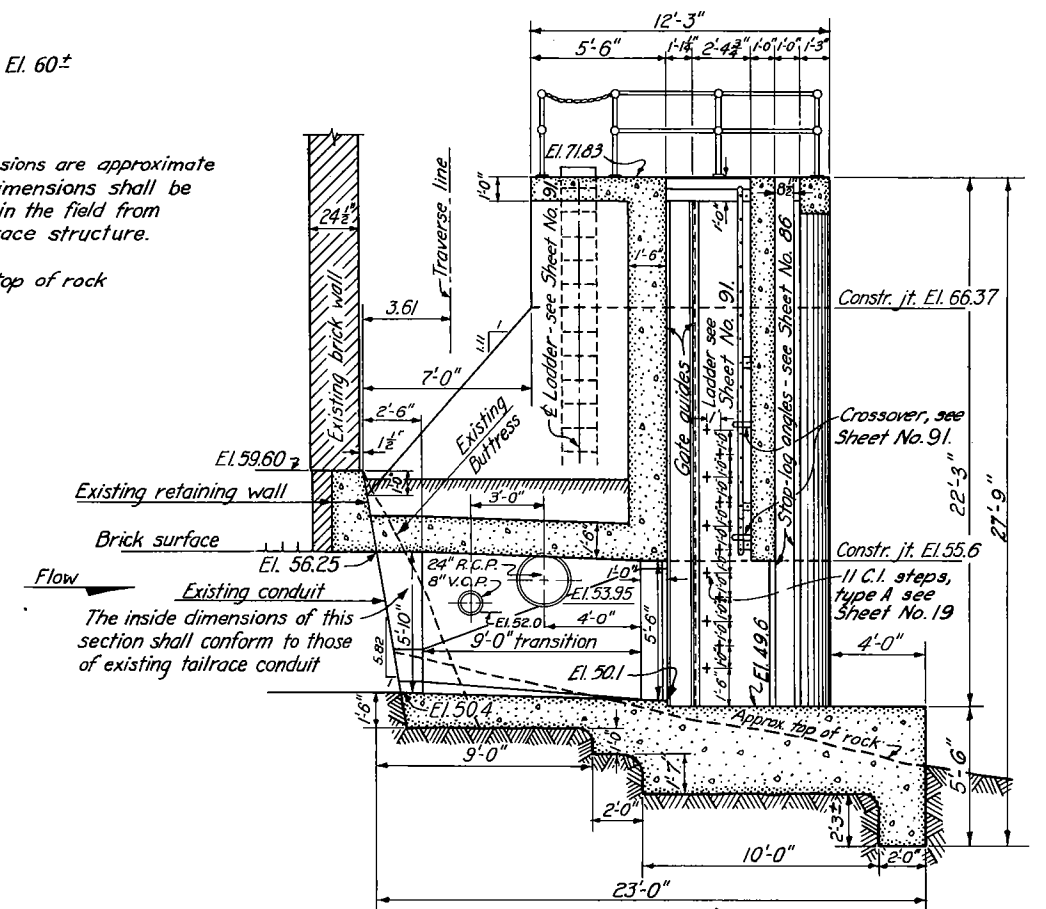
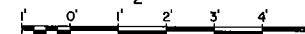
SECTION **C**
34

SCALE $\frac{1}{4}'' = 1'-0''$



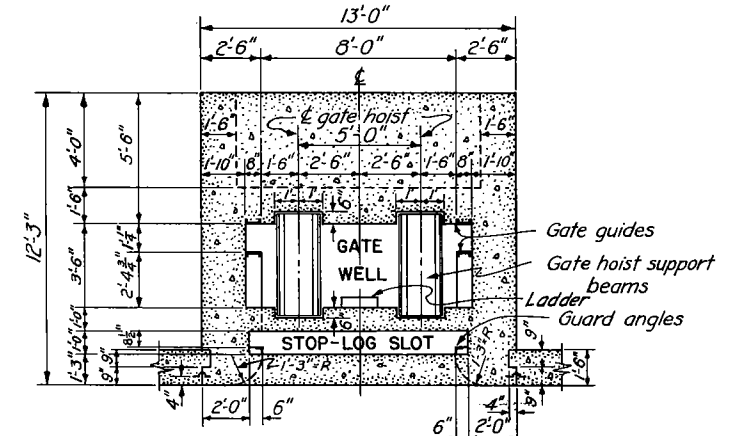
SECTION $\frac{D}{34}$

SCALE $\frac{1}{2}'' = 1'-0''$



SECTION $\frac{A}{34}$

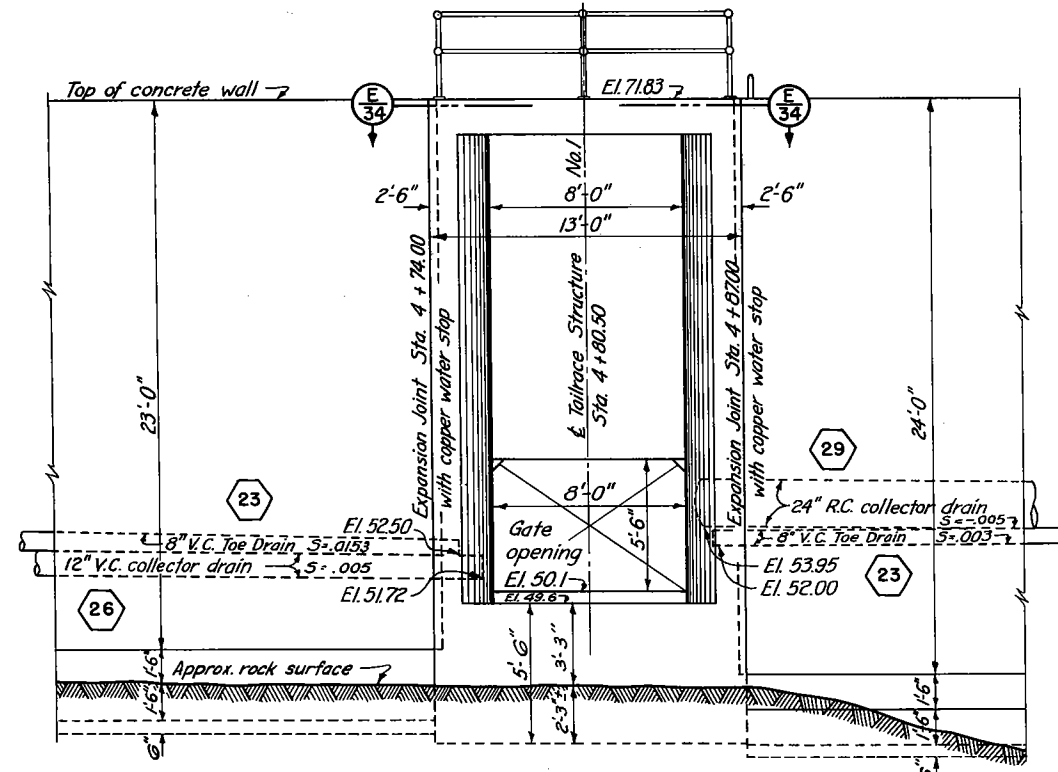
SCALE $\frac{1}{4}'' = 1'-0''$



SECTION $\frac{E}{34}$

SCALE $\frac{1}{4}'' = 1'-0''$

*Elevations refer to Mean Sea Level Datum.
Exposed corners of concrete shall be chamfered
as directed by the contracting officer.
All concrete on this sheet shall be paid class "A"
and will be paid for under Item No. 43.
Numbers in hexagons indicate items under which
payment will be made.*

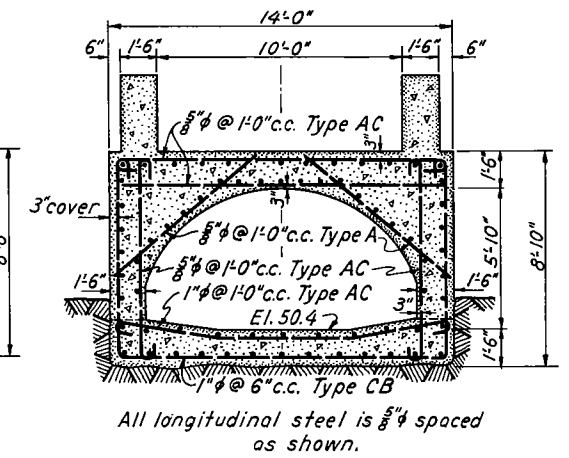


ELEVATION

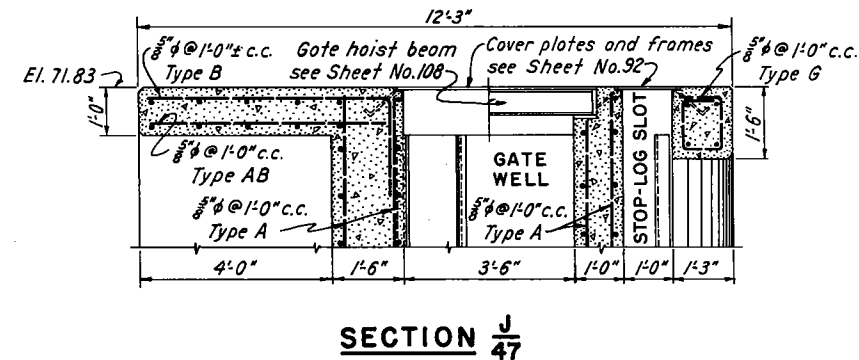
SCALE $\frac{1''}{4} = 1'-0''$

KEY	DATE	REVISION (indicated by Δ)	REV. BY	CK. BY	AP. B

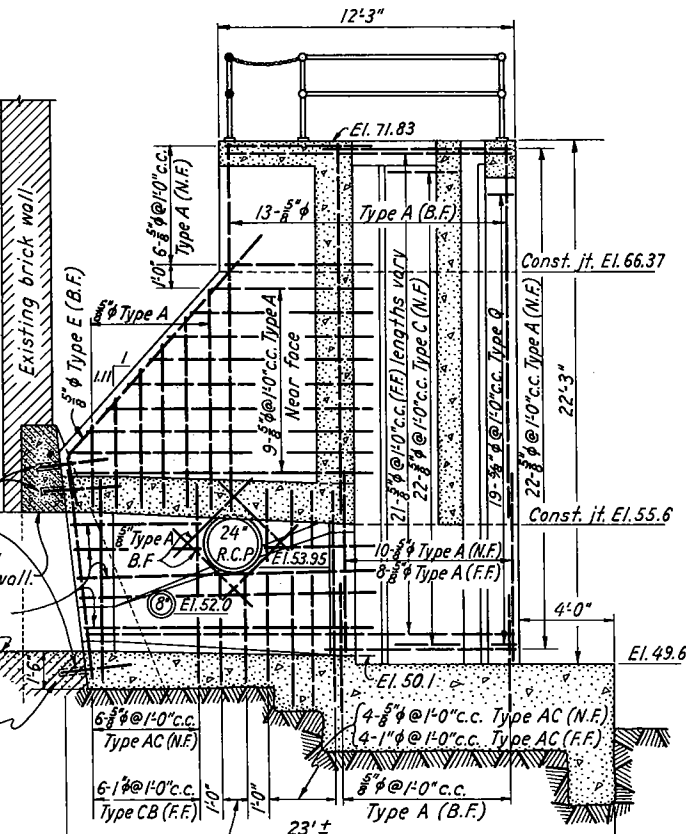
CONNECTICUT RIVER			FLOOD CONTROL		
DIKE-SOUTH BANK CHICOPEE RIVER AND DWIGHT PUMPING STATION					
TAILRACE NO. 1					
GATE STRUCTURE DETAILS					
CONNECTICUT RIVER			CHICOPEE, MASS.		
IN 110 SHEETS		SCALE: 1/4 IN. = 1 FT.		SHEET NO. 34	
U.S. ENGINEERING OFFICE, PROVIDENCE, R.I.,				MAY 1940	
DESIGNED BY: <i>Samuel B. Wilson</i> SENIOR ENGINEER HEAD, DESIGN SECTION		APPROVAL RECOMMENDED: <i>W. B. Brown</i> PRINCIPAL ENGINEER CHIEF, F.C. ENGINEERING DIV.		APPROVED: <i>W. B. Brown</i> LT COL., CORPS OF ENGINEERS DISTRICT ENGINEER	
DESIGNED BY: <i>P. C. Hancock</i> ASSIST. ENGINEER		DRAWN: W.S.B. TRACED: J.C. CHECKED: <i>W.B.</i>		FISCAL YEAR 1940 FILE NO. CT-4-2347	



SECTION $\frac{H}{47}$



SECTION $\frac{J}{47}$



SECTION C

- For concrete details see Sheet No.34
The minimum cover for main steel reinforcement shall be 3" except where concrete is poured against earth in which case it shall be 4".
Payment for furnishing, bending, and placing of steel reinforcement will be made under Item No.45
For bar type diagrams see Sheet No.13
Any reinforcement uncovered in 24" R.C. pipe shall be bent into transition wall.
N.F. designates near face; F.F. designates far face; and B.F. designates both faces.

[illegible]

APPENDIX E

Intercepting Sewer Plans

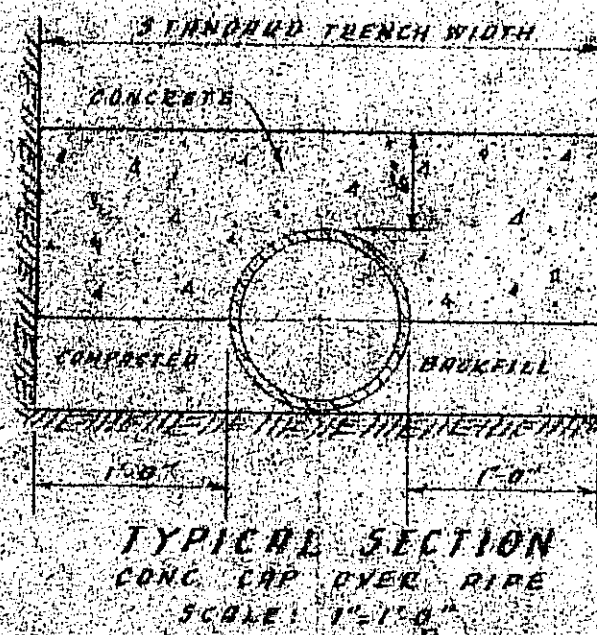
T.B.M. EL. 61.92
HYD. SPINDLE
BOOK NO. 16 PGE NO. 105

NOTE:
FULL UNDERGROUND ROOM
PROVIDE MANHOLE FOR
ELEC. SERVICE

PROPERTY OF
BERNARD M. CROSBY
JAMES R. CROWE

MH-CC-11
STA. 9+88

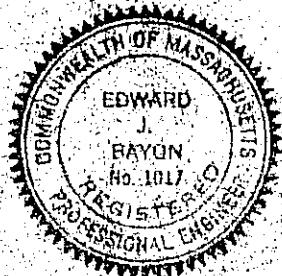
T.B.M. EL. 76.00
TOP OF PILLAR
BK. NO. 16 PGE NO. 104



INDUSTRIAL
FLOW DATA @ M.H. 12
TRIBUTARY AREA = 13.7 ACRES
FUTURE PEAK WET WEATHER FLOW = 136 MGD
PRESENT AVERAGE DRY WEATHER FLOW = 0.43 MGD

AREA
FLOW DATA @ M.H. 13
TRIBUTARY AREA = 16.1 ACRES
FUTURE PEAK WET WEATHER FLOW = 149 MGD
PRESENT AVERAGE DRY WEATHER FLOW = 1.55 MGD

RECORD PLAN



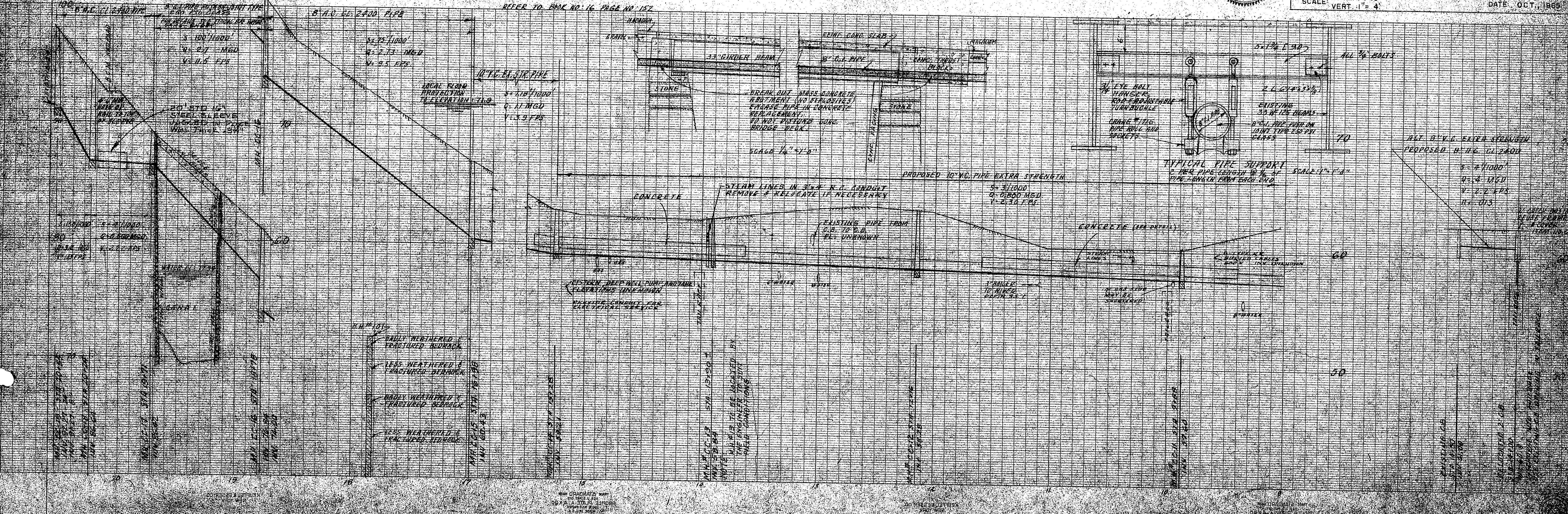
CHICOPEE CENTER INDUSTRIAL AREA
EAST OF PUMPING STATION
STA. 9+00 TO 15+70

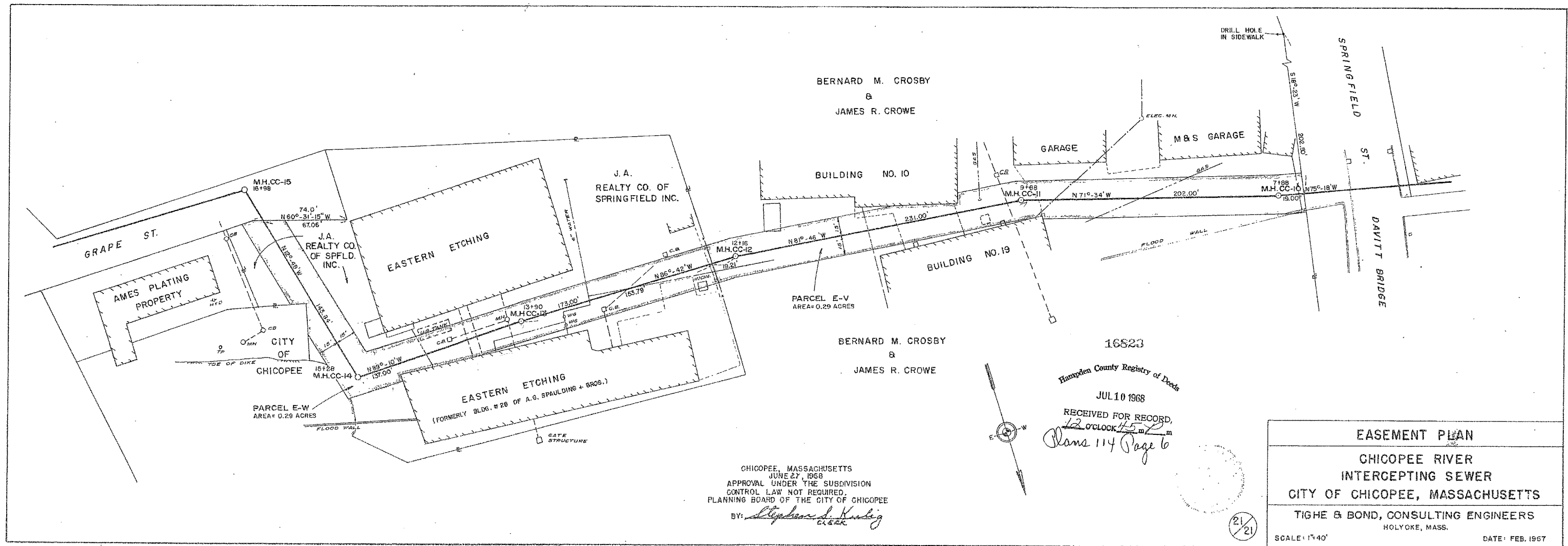
CHICOPEE RIVER
INTERCEPTING SEWER
CITY OF CHICOPEE, MASS

TIGHE & BOND, CONSULTING ENGINEERS
HOLYOKE, MASS

SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'

DATE: OCT. 1965





APPENDIX F

Correspondence from City of Chicopee

From: joe.lavallee
To: [Joe Kietner](mailto:Joe.Kietner)
Cc: lwitten@ohiengineering.com; ed.lewis@enlewis.com
Subject: Re: Eastern Etching Soils
Date: Monday, November 9, 2015 12:00:24 PM

Joe,

Thank you for the info. This was a surprise and we take anything of this nature with all seriousness as you know.

Lyons Witten, P.G., L.S.P. from Amherst, Ma (OHI Engineering and Environmental Science) will be contacting you this week to help us in this matter. There will be much info needed and collected as we look into this. Please assist him with necessary information as he is working with us so we do not expend the 120 days in any unnecessary manner.

Also, Ed Lewis will also be assisting in this as well. Ed is well versed with our facility and will be coordinating with Lyons.

Sincerely,

Joe Lavallee
Eastern Etching & Mfg. Co

On Fri, Nov 6, 2015 at 2:53 PM, Joe Kietner <jkietner@chicopeema.gov> wrote:

Mr. Lavallee,

I am writing to inform you that the City of Chicopee's contractor recently began work to make repairs and modifications to the flood control tailrace gate chamber on the abandoned tailrace at Eastern Etching and encountered compacted soil materials. The City of Chicopee (City) has tested the soils within the tailrace and flood control gate structure on the Eastern Etching property and found that the soils contain Reportable Concentrations (RC's) under 310 CMR 40.0000 (the Massachusetts Contingency Plan (MCP)), the state regulations for the cleanup of releases of oil and hazardous materials (OHM) to the environment.

The contractor initially entered the chamber and vacuumed the water and soil materials within the chamber, then sandbagged the upstream side where the tailrace enters the chamber from under the Eastern Etching building. The City and the contractor had performed sampling and analysis of materials collected within the chamber before starting the project, but those results indicated that the materials did not exceed RC's under the MCP for the constituents tested. The contractor reported that the sandbags were not completely containing new solid materials and that a strong odor was present after the initial cleanout of the chamber. Because the City also needs to clean the solid materials from the drain pipes

entering the chamber once the gate modification work is done, three samples of these soil materials were collected for laboratory analysis: One from the downstream toe drain, one from the upstream toe drain, and one from the tailrace behind the sandbags. The laboratory analysis results are summarized in Table 1, attached.

As shown in the table, there are concentrations of parameters in these materials above the Soil Category 2 RC's (the RCS-2 standards) and Upper Concentration Limits (UCL's) under the MCP. The upstream toe drain has total chromium, the downstream toe drain has total lead, and the tailrace has benzo(a)pyrene, total chromium, total lead, and C₉-C₃₆ total petroleum hydrocarbons (TPH) all in concentrations exceeding the RCS-2 standards. In addition, the tailrace sediment exceeded the UCL for total chromium.

The City has been advised by its consultant that the property owner should report this to the Massachusetts Department of Environmental Protection (MA DEP). Because of this discovery, the City will not be able to continue with the repair work until Eastern Etching notifies the MA DEP of the contaminated soils. In order to comply with the MCP, Eastern Etching should report these RSC-2 standard exceedances to MA DEP within 120 days.

Joe Kietner

Chief Operator

Chicopee DPW-WPC

[\(413\)-594-3585](tel:(413)-594-3585)

TABLE 1

CHICOPEE FLOOD CONTROL
CHICOPEE, MASSACHUSETTS

SOIL ANALYTICAL RESULTS - EASTERN ETCHING TAILRACE GATE STRUCTURE

ANALYTE	Laboratory Sample ID		E509X47	E509X46-01	E509X48
	Sample Name		E1 0928	E2 0928	E3 0928
	Sample Date		9/28/2015	9/28/2015	9/28/2015
	MCP UCLs	MCP RCS-2 Standards			
Volatile Organic Compounds (VOCs) by 8260C					
Chlorobenzene	10000	3	<0.130	<0.083	0.670
Semi-Volatile Organic Compounds (SVOCs) by 8270D					
Benzo(a)anthracene	3,000	40	<3.60	1.90	7.30
Benzo(a)pyrene	300	7	<3.60	1.90	7.50
Benzo(b)fluoranthene	3,000	40	1.80	2.20	12.0
Benzo(g,h,i)perylene	10,000	3,000	<3.60	<2.60	2.60
Benzo(k)fluoranthene	10,000	400	<3.60	<2.60	4.20
Bis(2-ethylhexyl)phthalate	10,000	600	<3.60	<2.60	25.0
Chrysene	10,000	400	<3.60	2.10	8.10
Fluoranthene	10,000	3,000	2.30	3.80	14.0
Indeno(1,2,3-cd)Pyrene	3,000	40	<3.60	<2.60	3.0
Phenanthrene	10,000	1,000	3.30	5.40	16.0
Pyrene	10,000	3,000	4.30	5.60	20.0
Polychlorinated Biphenyls (PCBs) by 8082A					
Aroclor-1016	100	4	<0.830	<0.640	<1.20
Aroclor-1221	100	4	<0.830	<0.640	<1.20
Aroclor-1232	100	4	<0.830	<0.640	<1.20
Aroclor-1242	100	4	<0.830	<0.640	<1.20
Aroclor-1248	100	4	<0.830	<0.640	<1.20
Aroclor-1254	100	4	<0.830	<0.640	<1.20
Aroclor 1268	100	4	<0.830	<0.640	<1.20
PCBs, total	100	4	<0.830	<0.640	<1.20
Total Petroleum Hydrocarbons by 8100					
C ₉ -C ₃₆ Total Petroleum Hydrocarbons (TPH)	10,000	3,000	1,000	1,400	5,800
Trace Metals by 6010C					
Arsenic	500	20	2.6	6.8	13
Barium	10,000	3,000	56	87	210
Cadmium	1,000	100	8.4	15	19
Chromium (Total)	2,000	200	490	170	3,400
Lead	6,000	600	63	1,600	2,200
Selenium	7,000	700	<0.23	<0.33	<0.63
Silver	2,000	200	1.8	1	22
Mercury by 7471B					
Mercury	300	30	0.096	0.065	0.54
Chemistry					
Reactive Cyanide (mg/kg)	NA	NA	<0.25	<0.25	<0.30
Reactive Sulfide (mg/kg)	NA	NA	<0.60	<35.0	<35.0
Ignitability (°F)	NA	NA	>160	>160	>160
pH (standard units)	NA	NA	7.1	7.7	7.2
TCLP					
Lead (mg/L)	NA	NA	0.047	0.062	0.16

Notes:

1) All units are mg/kg

2) <0.640 = Result was less than the indicated laboratory reporting limit.

3) Both, highlighted values exceed the applicable Reportable Concentration (RCS-2)

4) Both, red values exceed the applicable Upper Concentration Limit (UCL)



Annino Draper & Moore, P.C.

Calvin W. Annino, Jr.
Mark E. Draper
Louis S. Moore
M. Trant Campbell
Tracie M. Kester*

*Also admitted in CT

Annino, Draper & Moore, P.C. Attorneys at Law

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Springfield, MA 01115-5428
(413) 732-6400
Fax (413) 732-3339

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Westfield, MA 01085
(413) 562-9829

Northampton Office
16 Armory Street
Northampton, MA 01060
(413) 587-0730

www.admlawfirm.com

lmoore@admlawfirm.com

January 20, 2016

CERTIFIED MAIL/RETURN RECEIPT REQUESTED

Mr. Joseph A. Lavallee, President
The Eastern Etching and Manufacturing Company
35 Lower Grape Street
Chicopee, MA 01013

Re: Reportable Concentrations of Soil Contamination at The Eastern Etching and Manufacturing Company ("Eastern Etching") Property

Dear Mr. Lavallee:

Please be advised that this office represents the City of Chicopee (the "City") with respect to the matter set forth herein. As you know, the City is holder of an easement to maintain a flood protection dike and wall system, a portion of which is located on Eastern Etching's property.

The City notified you by email on November 6, 2015 that the City's contractor recently began work to repair and modify the flood gates at Flood Control Tailrace Gate Chamber No. 1 at the Eastern Etching property and encountered environmentally-impacted soil materials at this location within the City's easement. Laboratory analyses indicate the soil sampled from Gate Chamber No. 1 at Eastern Etching's property exceeds Massachusetts Department of Environmental Protection ("MassDEP") Reportable Concentrations for applicable soil standards, including lead, chromium and total petroleum hydrocarbons and also exceeds the Upper Concentration Limit for total chromium. Similar soil contamination was also encountered at Flood Control Tailrace Gate Chamber No. 2 at the abutting Ames Privilege Condominium property. I enclose herewith correspondence from the City's environmental consultants concerning this matter with supporting data results and plans showing sampling locations. This appears to be a reportable release or threat of release of oil and/or hazardous materials under Massachusetts General Laws, Chapter 21E and the Massachusetts Contingency Plan regulations, 310 CMR 40.0000 ("MCP").

As a result of this condition, the City cannot proceed with the repair and maintenance work on the flood control system until the soil contamination is properly addressed, including any notification to MassDEP. We believe that Eastern Etching is a responsible party under M.G.L. c. 21E, § 5 (a) (1) as owner of a property at or from which there has been a release or

Joseph A. Lavallee, President
The Eastern Etching and Manufacturing Company
January 20, 2016
Page 2

threat of release of oil and/or hazardous materials. On behalf of the City, I am contacting you and requesting that Eastern Etching:

(i) Agree to undertake timely response actions under the MCP, including any notification to MassDEP, and

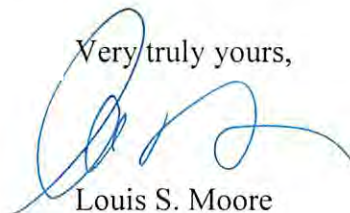
(ii) Coordinate with the City on all plans and work to address this matter including but not limited to scheduling and evaluating potential impacts of any such work on the City's flood control and storm water systems.

It is our understanding that Eastern Etching has retained Mr. Lyons Witten, a Licensed Site Professional, concerning this matter.

Before the City contractor can return to work within this area, we will need confirmation that all contamination exceeding applicable standards is removed from within collector drain and toe drain pipes as well as the gate chamber and that any contaminated soil in the tailrace is not reintroduced into the flood control system. Since the City has had to suspend its repair and maintenance work, including replacing the flood control system Tailrace No. 1 gate, it is imperative that the contaminated soil be addressed as soon as possible to ensure the protection of property, including the Eastern Etching property, and public safety in the event of flood conditions. Consequently, I am requesting that you contact me no later than **February 2, 2016** to advise me how Eastern Etching will proceed in response to the City's request.

Thank you for your anticipated prompt attention to this urgent matter. I look forward to hearing from you.

Very truly yours,



Louis S. Moore

LSM/lw
Enclosures

cc: Marshall T. Moriarty, City Solicitor
Mr. Jeffrey Neece
Mr. Joe Kietner
Mr. Nathaniel Arai
(all via email)



Baystate
Environmental
Consultants
Inc.

AGZA Company

Civil Engineers
Environmental Scientists
Planners

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GZA Offices in Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, New York, New Jersey, Pennsylvania, Illinois, Michigan, Ohio, West Virginia, Wisconsin

www.gza.com

December 16, 2015
File No. 15.0702100.20

Mr. Joe Kietner
Chief Operator
City of Chicopee
Department of Public Works – Water Pollution Control
80 Medina Street
Chicopee, MA 01013-3530

Re: Notice of Reportable Concentrations under the Massachusetts Contingency Plan
Flood Control Tailrace No. 1 Gate Chamber, and
Flood Control Tailrace No. 2 Gate Chamber

Dear Joe:

I am writing to inform you that the recently sampled soils acquired from within the Flood Control Tailrace Gate Chambers on the South Bank of the Chicopee River have been tested at a State-certified laboratory and have been found to contain Reportable Concentrations (RCs) under 310 CMR 40.0000 the Massachusetts Contingency Plan (MCP), the state regulations for the cleanup of releases of oil and hazardous materials (OHM) to the environment. As you know, the City's contractor recently began work to make repairs and modifications to the gate chambers at Flood Control Tailrace No. 1 (at Eastern Etching and Manufacturing) and Flood Control Tailrace No. 2 (at Ames Privilege), and encountered the environmentally-impacted soil materials.

Before commencing the tailrace repairs, the City and the contractor had performed sampling and analysis of soil materials collected within the gate chambers; those results indicated that the materials did not exceed RCs under the MCP for the constituents tested. In July 2015, the contractor vacuumed the water and soil materials from within the gate chambers, then sandbagged the upstream side where each tailrace enters its respective gate chamber to retain the soils within the tailraces. Some time elapsed between the removal of the soils from the chambers and the contractor starting the work on the gates. In September 2015, upon reentering the chambers to begin work, the contractor reported that the sandbags were not completely retaining the soils within the tailraces (i.e., new soil materials were within the gate chambers) and that a strong chemical odor was present. Because the City also needs to clean the soil materials from the drain pipes entering the chamber once the gate modification work is done, new samples were collected from the upstream mouth of the gate chambers and the pipes entering the chambers. In both chambers, the sampled soils contained concentrations of parameters above the Soil Category 2 RCs (RCS-2 Standards) and Upper Concentration Limits (UCLs) under the MCP. Sample descriptions and exceedances are summarized in the following tables.

Tailrace Gate Chamber No. 1 (at Eastern Etching & Manufacturing)	
Sample Description / Location	Constituents Exceeding RCS-2 Standards
Downstream (west) toe drain	Total chromium
Upstream (east) toe drain	Total lead
Upstream mouth of the gate chamber	Benzo(a)pyrene, total chromium, total lead, and C ₉ -C ₃₆ total petroleum hydrocarbons (TPH) [sample also exceeded the UCL for total chromium]



Tailrace Gate Chamber No. 2 (at Ames Privilege)	
Sample Description / Location	Constituents Exceeding RCS-2 Standards
Upstream (east) collector drain	Total chromium
Downstream (west) toe drain	Total chromium and total lead
Upstream mouth of the gate chamber	Cis-1,2-Dichloroethene, benzo(a)pyrene, and total chromium [sample also exceeded the UCL for total chromium]
Gate chamber floor	C ₁₉ -C ₃₆ total petroleum hydrocarbons (TPH) and C ₁₁ -C ₂₂ total petroleum hydrocarbons (TPH)

Sample locations are indicated on Figure 1, and laboratory analysis results are summarized in Tables 1 and 2, attached.

The City's flood control system in these locations is located within easements on private property. Because of results of the soil sampling and analysis, the City will not be able to continue with the repair work until the responsibility for handling and disposal of these materials is determined. Ultimately, notification of the presence of these contaminated soils should be given to the Massachusetts Department of Environmental Protection by the property owner or the responsible party.

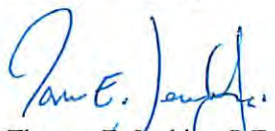
Please review these results and feel free to contact Nat Arai at (413) 726-2120.

Very truly yours,
BAYSTATE ENVIRONMENTAL CONSULTANTS, INC.

Very truly yours,
Baystate Environmental Consultants, Inc.


Nathaniel Y. Arai, P.E.
Sr. Project Manager


Gordon T. Brookman, LSP
Consultant / Reviewer

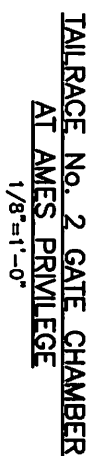

Thomas E. Jenkins, P.E.
Principal-in-Charge

Attachments: Figure 1 – Soil Sample Locations, Tailrace No. 1 & 2
Table 1 – Tailrace #1 Soil Analytical Results
Table 2 – Tailrace #2 Soil Analytical Results

Cc: Jeffrey Neece, City of Chicopee Department of Public Works



APPROX. LOCATION OF SOIL SAMPLES
ACQUIRED OCTOBER 26, 2015



PREPARED BY: DATE:		CITY OF CHICOOPEE DEPT. OF PUBLIC WORKS CHICOOPEE, MA	
PROJECT NO. REVISION NO.		CHICOOPEE FLOOD CONTROL WORKS CHICOOPEE, MA	
DRAWN BY: ERM CHECKED BY: DO		SOIL SAMPLE LOCATIONS TAILRACE NO. 1 & 2	
PROJECT NO. 15.0702100.20 REVISION NO.		FIGURE 1	

TABLE 1

CHICOPEE FLOOD CONTROL
CHICOPEE, MASSACHUSETTS

TAILRACE #1 GATE CHAMBER AT EASTERN ETCHING MANUFACTURING
SOIL ANALYTICAL RESULTS

ANALYTE	Laboratory Sample ID		E509X47	E509X46-01	E509X48
	Sample Name		E1 0928	E2 0928	E30928
	Sample Date		9/28/2015	9/28/2015	9/28/2015
	MCP UCLs	MCP RCS-2 Standards			
Volatile Organic Compounds (VOCs) by 8260C					
Chlorobenzene	10000	3	<0.130	<0.083	0.670
Semi-Volatile Organic Compounds (SVOCs) by 8270D					
Benzo(a)anthracene	3,000	40	<3.60	1.90	7.30
Benzo(a)pyrene	300	7	<3.60	1.90	7.50
Benzo(b)fluoranthene	3,000	40	1.80	2.20	12.0
Benzo(g,h,i)perylene	10,000	3,000	<3.60	<2.60	2.60
Benzo(k)fluoranthene	10,000	400	<3.60	<2.60	4.20
Bis(2-ethylhexyl)phthalate	10,000	600	<3.60	<2.60	25.0
Chrysene	10,000	400	<3.60	2.10	8.10
Fluoranthene	10,000	3,000	2.30	3.80	14.0
Indeno(1,2,3-cd)Pyrene	3,000	40	<3.60	<2.60	3.0
Phenanthrene	10,000	1,000	3.30	5.40	16.0
Pyrene	10,000	3,000	4.30	5.60	20.0
Polychlorinated Biphenyls (PCBs) by 8082A					
Aroclor-1016	100	4	<0.830	<0.640	<1.20
Aroclor-1221	100	4	<0.830	<0.640	<1.20
Aroclor-1232	100	4	<0.830	<0.640	<1.20
Aroclor-1242	100	4	<0.830	<0.640	<1.20
Aroclor-1248	100	4	<0.830	<0.640	<1.20
Aroclor-1254	100	4	<0.830	<0.640	<1.20
Aroclor 1268	100	4	<0.830	<0.640	<1.20
PCBs, total	100	4	<0.830	<0.640	<1.20
Total Petroleum Hydrocarbons by 8100					
C ₉ -C ₃₆ Total Petroleum Hydrocarbons (TPH)	10,000	3,000	1,000	1,400	5,800
Trace Metals by 6010C					
Arsenic	500	20	2.6	6.8	13
Barium	10,000	3,000	56	87	210
Cadmium	1,000	100	8.4	15	19
Chromium (Total)	2,000	200	490	170	3,400
Lead	6,000	600	63	1,600	2,200
Selenium	7,000	700	<0.23	<0.33	<0.63
Silver	2,000	200	1.8	1	22
Mercury by 7471B					
Mercury	300	30	0.096	0.065	0.54
Classical Chemistry					
Reactive Cyanide (mg/kg)	NA	NA	<0.25	<0.25	<0.30
Reactive Sulfide (mg/kg)	NA	NA	<0.60	<35.0	<35.0
Ignitability (°F)	NA	NA	>160	>160	>160
pH (standard units)	NA	NA	7.1	7.7	7.2
TCLP					
Lead (mg/L)	NA	NA	0.047	0.062	0.16

Notes:

1) All units are mg/kg

2) <0.640 = Result was less than the indicated laboratory reporting limit.

3) Bold, highlighted values exceed the applicable Reportable Concentration (RCS-2).

4) Bold, pink values exceed the applicable Upper Concentration Limit (UCL).

TABLE 2

CHICOPEE FLOOD CONTROL
CHICOPEE, MASSACHUSETTS

TAILRACE #2 GATE CHAMBER AT AMES PRIVILEGE
SOIL ANALYTICAL RESULTS

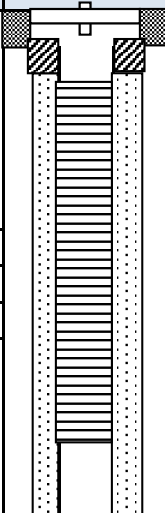
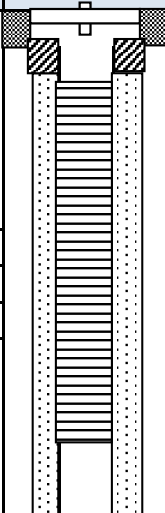
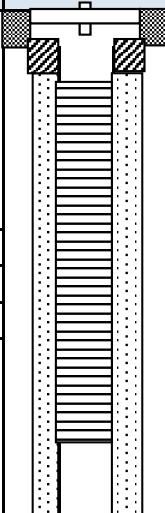
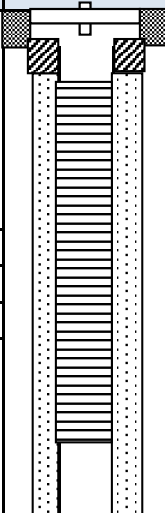
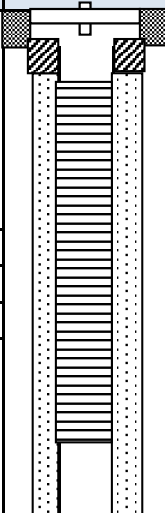
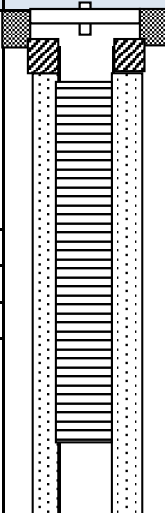
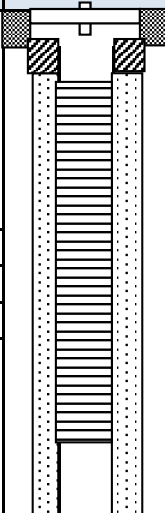
Laboratory Sample ID			E510P89 (1)	E510P89 (2)	E510P89 (4)	E510P89 (3)	E510P89 (5)
Sample Name			A1 1026 (30" Collector Upstream)	A2 1026 (Down Stream Toe Drain)	A4 1026 (Tailrace)	A3 1026 (Up Stream Toe Drain)	A5 1026 (Chamber Floor)
Sample Date			10/26/2015	10/26/2015	10/26/2015	10/26/2015	10/26/2015
ANALYTE	MCP UCLs	MCP RCS-2 Standards					
Volatile Organic Compounds (VOCs) by 8260C							
cis-1,2-Dichloroethene	5,000	0.1	<0.120	<0.120	2.20	NT	NT
trans-1,2-Dichloroethene	10,000	1	<0.120	<0.120	0.120	NT	NT
Trichloroethene	600	0.3	<0.120	<0.120	0.160	NT	NT
Semi-Volatile Organic Compounds (SVOCs) by 8270D							
Benzo(a)anthracene	3,000	40	<10.0	<10.0	11.0	NT	NT
Benzo(a)pyrene	300	7	<10.0	<10.0	11.0	NT	NT
Benzo(b)fluoranthene	3,000	40	16.0	<10.0	17.0	NT	NT
Bis(2-ethylhexyl)phthalate	10,000	600	<10.0	<10.0	36.0	NT	NT
Chrysene	10,000	400	11.0	<10.0	10.0	NT	NT
Fluoranthene	10,000	3,000	25.0	<10.0	21.0	NT	NT
Phenanthrene	10,000	1,000	18.0	<10.0	15.0	NT	NT
Pyrene	10,000	3,000	43.0	<10.0	32.0	NT	NT
Polychlorinated Biphenyls (PCBs) by 8082A							
Aroclor-1016	100	4	<0.860	<0.770	<0.530	NT	<4.50
Aroclor-1221	100	4	<0.860	<0.770	<0.530	NT	<4.50
Aroclor-1232	100	4	<0.860	<0.770	<0.530	NT	<4.50
Aroclor-1242	100	4	<0.860	<0.770	<0.530	NT	<4.50
Aroclor-1248	100	4	<0.860	<0.770	<0.530	NT	<4.50
Aroclor-1254	100	4	<0.860	<0.770	0.560	NT	<4.50
Aroclor 1260	100	4	<0.860	<0.770	<0.530	NT	<4.50
PCBs, total	100	4	<0.860	<0.770	0.560	NT	<4.50
Total Petroleum Hydrocarbons by 8100							
C ₉ -C ₃₆ Total Petroleum Hydrocarbons (TPH)	10,000	3,000	1,700	390	2,600	2,400	NT
Extractable Petroleum Hydrocarbons (EPH) by MADEP EPH 04-1.1							
C ₉ -C ₁₈ Aliphatic Hydrocarbons	20,000	3,000	NT	NT	NT	NT	1,670
C ₁₉ -C ₃₆ Aliphatic Hydrocarbons	20,000	5,000	NT	NT	NT	NT	13,900
C ₁₁ -C ₂₂ Aromatic Hydrocarbons	10,000	3,000	NT	NT	NT	NT	8,730
Trace Metals by 6010C							
Arsenic	500	20	3.6	21	8.1	NT	NT
Barium	10,000	3,000	90	770	100	NT	NT
Cadmium	1,000	100	6.7	15	2.5	NT	NT
Chromium (Total)	2,000	200	580	250	3,600	NT	NT
Lead	6,000	600	110	790	500	NT	NT
Selenium	7,000	700	<0.69	4.3	<0.44	NT	NT
Silver	2,000	200	<1.8	3.8	1.0	NT	NT
Mercury by 7471B							
Mercury	300	30	<0.092	1.9	0.20	NT	NT
Classical Chemistry							
Reactive Cyanide (mg/kg)	NA	NA	<0.40	<0.40	<0.40	NT	NT
Reactive Sulfide (mg/kg)	NA	NA	<75.0	<75.0	<75.0	NT	NT
Ignitability (*F)	NA	NA	>160	>160	>160	NT	NT
TCLP							
Lead (mg/L)	NA	NA	<0.082	<0.040	0.41	NT	NT

Notes:

- 1) All units are mg/kg
- 2) <0.640 = Result was less than the indicated laboratory reporting limit.
- 3) Bold, highlighted values exceed the applicable Reportable Concentration (RCS-2).
- 4) Bold, pink values exceed the applicable Upper Concentration Limit (UCL).
- 5) Orange values indicate that the laboratory reporting limit exceeded the applicable standard.
- 6) NT = Not Tested

APPENDIX G

Boring Logs

OHI Engineering, Inc. 110 Pulpit Hill Road Amherst, MA 01002 (413) 835-0780						PROJECT: Eastern Etching & Mfg, Inc. LOCATION: 35 Lower Grape St, Chicopee MA Project No.: 15-1700 Drilling Co.: Martin GeoEnvironmental		BORING NO.: OHI-1 SHEET NO.: 1 of 1 DATE: 4/15/2016 OHI Engineer/Geolo: WLW	
GROUNDWATER READINGS				CASING		SAMPLER		CORE BARREL	
DATE		TIME		DEPTH		TYPE & I.D.		GeoProbe	
4/15/16		1:30p		7.54'		HAMMER WT.		Jeremy & Rob	
						HAMMER FALL			
D E P T H	C B A L S O I W N S G	SAMPLE COLLECTION DATA				SAMPLE DESCRIPTION		WELL CONSTRUCTION	STRATUM DESCRIPTION
		PID	PEN/ REC	DEPTH (ft)					
5						Asphalt Sand, silt, brick, gravel			Fill Material
	0.0	33/48"		S-1					
10						Brown F-M SAND, wet. C SAND wet. Brown, dense FS and SILT moist Tan/brown SILT and CLAY, dense, dry			Glacial Till
	0.0	32/48"		S-2					
15						EOB/Refusal at 14' S-2 8:20 to lab for EPH & metals			
20									
25									
30									
35									

LEGEND
 2" PVC WELL SCREEN - 0.01" SLOTS
 SILICA SAND FILTER PACK
 BENTONITE SEAL
 CONCRETE SEAL

REMARKS:
 Set 10' 0.10" slot screen 12'-2', solid riser to grade; flush road box at grade set in concrete;
 sand 12'-1.5'; bentonite seal 1.5'-1'; cuttings to grade w/ 1' concrete seal.

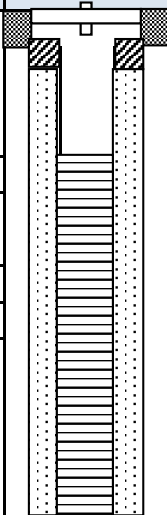
 PID screening with TEI 580B; no positive detections.

OHI-1

**110 Pulpit Hill Road
Amherst, MA 01002
(413) 835-0780**



BORING NO.:	OHI-2 / B-2A
SHEET NO.:	1 of 1
DATE:	4/15/2016 / 9/26/17
OHI Engineer/Geologist WLW	

GROUNDWATER READINGS				CASING	SAMPLER	CORE BARREL	G.S. ELEVATION:	
DATE	TIME	DEPTH		TYPE & I.D.	GeoProbe	Jeremy & Rob	DATUM:	
				HAMMER WT.				LOCATION: North side of O/W excavation
				HAMMER FALL				
DEPTH	C.B. ALLOWING	SAMPLE COLLECTION DATA				SAMPLE DESCRIPTION	WELL CONSTRUCTION	STRATUM DESCRIPTION
		PID	PEN/REC	DEPTH (ft)				
5						Asphalt		Fill Material
					Brown F-C SAND, some SILT, GRAVEL, dry			
		0.0	30/60"	S-1	Brown FS and SILT, compact, moist			
				Black, brown, gray, yellow, ash				
				Brown and red, GRAVEL & BRICK w/ SILT matrix				
10		698	54/60"	S-2	Black GRAVEL with FS & SILT matrix, soil sheen, strong odor oil & septic			
15		51	60/60"		Tip = Brown, olive FS & SILT, dense, EOB at 14'			

OHI Engineering, Inc.

110 Pulpit Hill Road
Amherst, MA 01002
(413) 835-0780



PROJECT: Eastern Etching & Mfg, Inc.
LOCATION: 35 Lower Grape St, Chicopee MA
Project No.: 15-1700
Drilling Co.: Martin GeoEnvironmental

BORING NO.: **OHI-3 / B-3A**
SHEET NO.: 1 of 1
DATE: 4/15/2016 / 9/26/17
OHI Engineer/Geolo: WLW

GROUNDWATER READINGS				CASING			SAMPLER		CORE BARREL		G.S. ELEVATION:	
DATE	TIME	DEPTH	TYPE & I.D.		GeoProbe	Jeremy & Rob					DATUM:	
			HAMMER WT.								LOCATION: North side of O/W excavation	
			HAMMER FALL									
DEPTH	C.B. ALLOWING	SAMPLE COLLECTION DATA				SAMPLE DESCRIPTION	WELL CONSTRUCTION	STRATUM DESCRIPTION				
		PID	PEN/ REC	DEPTH (ft)								
5						Asphalt						
						Brown F-C SAND, SILT, dry						
						Black, brown, orange, F-C SAND, SILT, brick, GRAVEL, ash, dry						
		4.0	36/60"		S-1							
10						Black F-C SAND, SILT, GRAVEL, oily, strong odor of oil & septic, wet						
		107	42/60"		S-2							
15						Concrete						
		142	56/60"		S-3	Black oily GRAVEL, wet						
		12			S-4	Tip = Brown, olive FS & SILT, compact, EOB at 14'						
20												
25												
30												
35												

LEGEND

2" PVC WELL SCREEN - 0.01" SLOTS

SILICA SAND FILTER PACK

BENTONITE SEAL

CONCRETE SEAL

REMARKS:

Set 10' 0.10" slot screen 14'-4', solid riser to grade; flush road box at grade set in concrete; sand 14'-3'; bentonite seal to 1.5'; cuttings to grade w/ 1' concrete seal.

OHI-3 S-2 9-10' 9:30am to lab for EPH & 14 MCP metals, VOCs, 8015 fingerprint (4/15/2016)

B-3A-4' 4-5' 11:20 for coal, ash, and 14 metals (9/26/2017)

OHI-3 water sample 3:25: EPH, 14 metals, 8015 fingerprint

OHI-3

OHI Engineering, Inc.

110 Pulpit Hill Road
Amherst, MA 01002
(413) 835-0780



PROJECT: Eastern Etching & Mfg, Inc.
LOCATION: 35 Lower Grape St, Chicopee MA
Project No.: 15-1700
Drilling Co.: Martin GeoEnvironmental

BORING NO.: **OHI-4 / B-4A**
SHEET NO.: 1 of 1
DATE: 4/15/2016 / 9/26/17
OHI Engineer/Geolo: WLW

GROUNDWATER READINGS						CASING	SAMPLER	CORE BARREL	G.S. ELEVATION:	
DATE	TIME	DEPTH	TYPE & I.D.			Drill	Jeremy & Rob		DATUM:	
			HAMMER WT.					LOCATION: E. of tail race, N. side alley behind corner of metal storage unit		
			HAMMER FALL							
DEPTH	C.B. AL. S.O. W.N.S.G.	SAMPLE COLLECTION DATA				SAMPLE DESCRIPTION	WELL CONSTRUCTION	STRATUM DESCRIPTION		
		PID	PEN/ REC	DEPTH (ft)						
5		1.4		3/24	0-2	4-3-1-1	Asphalt		Fill Material	
							Brown F-C SAND, brick fragments			
		1.0		2/24	2-4	6-4-3-2	Black ash, cinders, brick fragments, concrete			
				0/24	4-6	3-3-3-7				
		6.2		4/24	6-8	16-5-4-9				
10		4.4		7/24	8-10	S-2	Stone fragments, brick fragments			
		0.8		9/24	10-12	10-15-19-27	Brick fragments, crushed stone F-C SAND			
15							EOB at 12'			
20										
25										
30										
35										

LEGEND

- 2" PVC WELL SCREEN - 0.01" SLOTS
- SILICA SAND FILTER PACK
- BENTONITE SEAL
- CONCRETE SEAL

REMARKS:

Set 10' 0.10" slot screen 12'-2', solid riser to grade; flush road box at grade set in concrete; sand 12'-1.5'; bentonite seal to 1.5'; cuttings to grade w/ 1' concrete seal.

B-4 S-4 6-8' 2:00 pm to lab for EPH & 14 metals(4/15/2016)

B-4A-4' 4-6' 11:35 for coal, ash and metals

OHI-4

OHI Engineering, Inc.

110 Pulpit Hill Road
Amherst, MA 01002
(413) 835-0780



PROJECT: Eastern Etching & Mfg, Inc.
LOCATION: 35 Lower Grape St, Chicopee MA
Project No.: 15-1700
Drilling Co.: Martin GeoEnvironmental

BORING NO.: **OHI-5 / B-5A**
SHEET NO.: 1 of 1
DATE: 4/15/2016 / 9/26/2017
OHI Engineer/Geolo: WLW

GROUNDWATER READINGS				CASING			SAMPLER			CORE BARREL		
DATE	TIME	DEPTH	TYPE & I.D.			Mobile drill			Jeremy & Chris			
			HAMMER WT.									
			HAMMER FALL									
DEPTH	C.B.A.L.S.O.W.N.S.G.	SAMPLE COLLECTION DATA				SAMPLE DESCRIPTION	WELL CONSTRUCTION	STRATUM DESCRIPTION				
		PID	PEN/REC	DEPTH (ft)								
5						2" concrete pad						
						F-C SAND, and GRAVEL, brown						
						Black ash, cinders, brick fragments, concrete						
	1.7	2/24		2-1-2-2								
	0.2	6/24		4-9-16-16								
	56											
10	494	24/24		17-24-23-16	Silver/gray/blue sheen on S&G 7-7.5', some maroon matrix							
	10	7/24		16-25-48-50/4"	Brown F-C SAND & SILT							
					Gray with maroon hue, FS& SILT, some GRAVEL, dense, wet							
	50	9/18		23-68-71								
15						EOB at 11.5'						
20												
25												
30												
35												

LEGEND

2" PVC WELL SCREEN - 0.01" SLOTS

SILICA SAND FILTER PACK

BENTONITE SEAL

CONCRETE SEAL

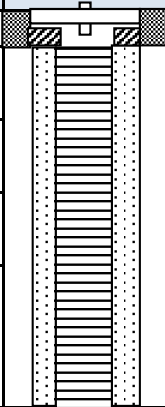
REMARKS:

Set 10' 0.10" slot screen 11.5'-1.5', solid riser to grade; flush road box at grade set in concrete. sand 11.5'-1.5'; bentonite seal to 1.5'; cuttings to grade w/ 1' concrete seal.

B-5 S-4 7-8' 9:30 am to lab for EPH & 14 metals (4/15/2016)

B-5A-3' 3-4' 3:25 for coal, ash, and metals (9/26/2017)

OHI-5

OHI Engineering, Inc. 110 Pulpit Hill Road Amherst, MA 01002 (413) 835-0780									PROJECT: Eastern Etching & Mfg, Inc. LOCATION: 35 Lower Grape St, Chicopee MA Project No.: 15-1700 Drilling Co.: Martin GeoEnvironmental			BORING NO.: OHI-6 SHEET NO.: 1 of 1 DATE: 5/10/2016 OHI Engineer/Geolo: WLW			
GROUNDWATER READINGS						CASING			SAMPLER			CORE BARREL			
DATE		TIME		DEPTH		TYPE & I.D.			GeoProbe			Jeremy & Chris			
						HAMMER WT.									
						HAMMER FALL									
D E P T H	C B A L S O W I N G	SAMPLE COLLECTION DATA					SAMPLE DESCRIPTION					WELL CONSTRUCTION		STRATUM DESCRIPTION	
		PID	PEN/REC	DEPTH (ft)											
5							2" concrete pad								
		18		5/24	0-2	3-1-0-1	dark gray SHALE, pulverized								
		12		14/24	2-4	8-11-3-2	F-C SAND & GRAVEL, brown								
		3		5/24	4-6	1-1-4-6	Brown/gray F-C SAND & GRAVEL								
10							Gray with maroon hue, FS& SILT, some GRAVEL, dense, wet					Glacial till			
		108		9/24	6-8										
							8-11-18-27								
							48-60								
							EOB at 11'								
15															
20															
25															
30															
35															

LEGEND


2" PVC WELL SCREEN - 0.01" SLOTS


SILICA SAND FILTER PACK


BENTONITE SEAL

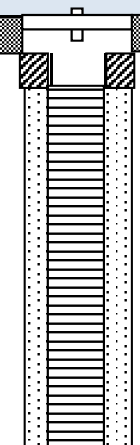

CONCRETE SEAL

REMARKS:

Set 10' 0.10" slot screen 11'-1', solid riser to grade; flush road box at grade set in concrete. sand 11'-1'; bentonite seal to 0.5'; cuttings to grade w/ 1' concrete seal.

B-6 S-4 8-10' 10:30 am to lab for EPH & 14 metals

OHI-6

OHI Engineering, Inc. 110 Pulpit Hill Road Amherst, MA 01002 (413) 835-0780									PROJECT: Eastern Etching & Mfg, Inc. LOCATION: 35 Lower Grape St, Chicopee MA Project No.: 15-1700 Drilling Co.: Martin GeoEnvironmental			BORING NO.: OHI-7 / B-7A SHEET NO.: 1 of 1 DATE: 5/10/2016 / 9/26/2017 OHI Engineer/Geolo: WLW													
GROUNDWATER READINGS						CASING			SAMPLER			CORE BARREL													
DATE		TIME		DEPTH		TYPE & I.D.			HSA mobile drill			Jeremy & Chris													
						HAMMER WT.																			
						HAMMER FALL																			
D E P T H		C B A L S O W I N G		SAMPLE COLLECTION DATA						SAMPLE DESCRIPTION						WELL CONSTRUCTION		STRATUM DESCRIPTION							
				PID		PEN/ REC		DEPTH (ft)																	
5										Asphalt								Fill material							
		1.7				10/24		0-2		4-5-6-4		Black F-C SAND, COAL and COAL ASH, some F-C SAND & GRAVEL													
		1.3				8/24		2-4		3-5-5-2		Brown & black FS and SILT, wet													
		2.0				11/24		4-6		5-5-3-3															
		4.3				16/24		6-8		3-2-1-1															
		0.0				6/24		8-10		4-1-1-4										Brown FS and SILT, some Clay, wet					
		0.0				22/24		10-12																	
		10										EOB at 12'													
15																									
20																									
25																									
30																									
35																									

LEGEND


2" PVC WELL SCREEN - 0.01" SLOTS


SILICA SAND FILTER PACK


BENTONITE SEAL


CONCRETE SEAL

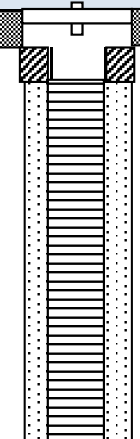
REMARKS:

Set 10' 0.10" slot screen 12'-2'; solid riser to grade; flush road box at grade set in concrete.
 sand 12-2'; bentonite seal to 1'; cuttings to grade w/ 1' concrete seal

B-7 S-4 6-8' 12:10 pm to lab for EPH & 14 metals (4/15/2016)

B-7A-3' 3-4' drilled to 5' 3:15 for coal, ash, and metals (9/26/2017)

OHI-7

OHI Engineering, Inc. 110 Pulpit Hill Road Amherst, MA 01002 (413) 835-0780						PROJECT: Eastern Etching & Mfg, Inc. LOCATION: 35 Lower Grape St, Chicopee MA Project No.: 15-1700 Drilling Co.: Martin GeoEnvironmental		BORING NO.: OHI-8 SHEET NO.: 1 of 1 DATE: 9/26/2017 OHI Engineer/Geolo: WLW	
GROUNDWATER READINGS				CASING		SAMPLER		CORE BARREL	
DATE		TIME		DEPTH		TYPE & I.D.		GeoProbe	
						HAMMER WT.		Jeremy & Chris	
						HAMMER FALL			
D E P T H	C B A L S O W I N G	SAMPLE COLLECTION DATA				SAMPLE DESCRIPTION		WELL CONSTRUCTION	STRATUM DESCRIPTION
		PID	PEN/ REC	DEPTH (ft)					
5						Asphalt			Fill material
		0.0		60/36		12" crushed brick			
						16" brown and black, F-C sand coal and ash			
		0.0			3-4	B-8-3'			
						C,M			
						Crushed brick			
				60/34		Brown F-C sand, some gravel, wet			
		0.0							
		0.0							
10									
		0.0							
				60/60					
		0				Red, brown, stilstone and sand			
15						EOB at 15'			
20									
25									
30									
35									

LEGEND


2" PVC WELL SCREEN - 0.01" SLOTS


SILICA SAND FILTER PACK


BENTONITE SEAL

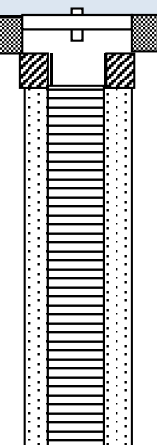

CONCRETE SEAL

REMARKS:

Set 10' 0.10" slot screen 12'-2'; solid riser to grade; flush road box at grade set in concrete.
 sand 12-2'; bentonite seal to 1'; cuttings to grade w/ 1' concrete seal

B-8-3 3-4' 2:45 coal, and 14 metals (9/26/2017)

OHI-8

OHI Engineering, Inc. 110 Pulpit Hill Road Amherst, MA 01002 (413) 835-0780						PROJECT: Eastern Etching & Mfg, Inc. LOCATION: 35 Lower Grape St, Chicopee MA Project No.: 15-1700 Drilling Co.: Martin GeoEnvironmental		BORING NO.: OHI-9 SHEET NO.: 1 of 1 DATE: 9/26/2017 OHI Engineer/Geolo: WLW	
GROUNDWATER READINGS				CASING		SAMPLER		CORE BARREL	
DATE		TIME		DEPTH		TYPE & I.D.		GeoProbe	
						HAMMER WT.		Jeremy & Chris	
						HAMMER FALL			
D E P T H	C B A L S O N I N G	SAMPLE COLLECTION DATA				SAMPLE DESCRIPTION		WELL CONSTRUCTION	STRATUM DESCRIPTION
		PID	PEN/REC	DEPTH (ft)					
5						Asphalt			Fill material
		0.0				Brown, tan, F-M sand and silt, brick fragments, ash			
10		0.0				Coal 2", Brown, dark brown, red, F-C sand, silt, gravel, brick fragments			
		1.0				6" F-M sand slag dark grey FS and silt			
						4" slag			
						8" brown and oragne F-S silt, gravel, wet			
						3" grey, oily, shale fragemnts and cal			
15						14" brown and red, M-CS, gravel, brick fragments			
						37" black, F-C sand, gravel, silty, coal fragments, some brick, oil odor			
		48				6" red, brown, silt, gravel, wet			
						B-9-12'			
						C,E,M			
		3							
20						EOB at 15'			
25									
30									
35									

LEGEND


2" PVC WELL SCREEN - 0.01" SLOTS


SILICA SAND FILTER PACK

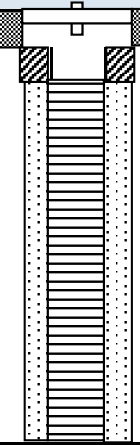

BENTONITE SEAL


CONCRETE SEAL

REMARKS:

Set 10' 0.10" slot screen 12'-2'; solid riser to grade; flush road box at grade set in concrete.
 sand 12-2'; bentonite seal to 1'; cuttings to grade w/ 1' concrete seal

OHI-9

OHI Engineering, Inc. 110 Pulpit Hill Road Amherst, MA 01002 (413) 835-0780									PROJECT: Eastern Etching & Mfg, Inc. LOCATION: 35 Lower Grape St, Chicopee MA Project No.: 15-1700 Drilling Co.: Martin GeoEnvironmental			BORING NO.: OHI-10 SHEET NO.: 1 of 1 DATE: 9/26/2017 OHI Engineer/Geolo: WLW			
GROUNDWATER READINGS						CASING			SAMPLER			CORE BARREL			
DATE		TIME		DEPTH		TYPE & I.D.			GeoProbe			Jeremy & Chris			
						HAMMER WT.									
						HAMMER FALL									
D E P T H	C B A L S O W I N G	SAMPLE COLLECTION DATA					SAMPLE DESCRIPTION					WELL CONSTRUCTION		STRATUM DESCRIPTION	
		PID	PEN/ REC	DEPTH (ft)											
5							Asphalt						Fill material		
							Tan, F-Sand (loose probe almost sunk under its own weight to 5')								
							Tan F-C sand, brick, and concrete, dry								
							Brown, orange F-C sand, wood, brick, concrete, spetic odor, wet								
							B-10-5' C,M								
10							B-10=7' E, M, F								
							Balck, F-C sand and gravel, pocket of gret grease, rest black and oily								
							B-10-12' E,M								
15							grey, brown, F-C sand and gravel, wet								
							EOB at 15'								
20															
25															
30															
35															

LEGEND


2" PVC WELL SCREEN - 0.01" SLOTS


SILICA SAND FILTER PACK


BENTONITE SEAL


CONCRETE SEAL

REMARKS:

Set 10' 0.10" slot screen 15'-5', solid riser to grade; flush road box at grade set in concrete.
 sand 15-4'; bentonite seal to 1'; cuttings to grade w/ 1' concrete seal

B-10 coal, and 14 metals (9/26/2017)

OHI-10

OHI Engineering, Inc.

110 Pulpit Hill Road
Amherst, MA 01002
(413) 835-0780



PROJECT: Eastern Etching & Mfg, Inc.
LOCATION: 35 Lower Grape St, Chicopee MA
Project No.: 15-1700
Drilling Co.: Martin GeoEnvironmental

BORING NO.: **OHI-11**
SHEET NO.: 1 of 1
DATE: 9/26/2017
OHI Engineer/Geolo: WLW

GROUNDWATER READINGS						CASING	SAMPLER	CORE BARREL	G.S. ELEVATION:		
DATE	TIME	DEPTH	TYPE & I.D.			GeoProbe	Jeremy & Chris	DATUM:			
			HAMMER WT.						LOCATION:		
			HAMMER FALL								
DEPTH	C.B.A.L.S.O.W.S.G.	SAMPLE COLLECTION DATA				SAMPLE DESCRIPTION	WELL CONSTRUCTION	STRATUM DESCRIPTION			
		PID	PEN/REC	DEPTH (ft)							
5						Asphalt		Fill material			
		0.0				12" crumbled asphalt and concrete F-C sand, brown, dry 2" crushed concrete					
						10" orange, brown, F-C sand, ash and cola fragments					
		0.0	60/42			12" brown, FS sand (5'6")					
						10" brown, FC sand, gravel, crushed slate and brickash, wet					
					5" black, FMS, oily odor						
	0.0										
		60/28									
10		85			10-11	5" F-M sand and gravel, gasoline odor, red/brown, wet					
		347			11-12	6" black, F-M sand and gravel, septic odor, oily					
		293	60/32		12-14	8" black F-C sand and gravel, septic odor					
						13" red, brown, gravel, 0 silt matrix, septic odor					
15						red brown gravel w/ silt matrix, septic odor					
						EOB at 15'					
20											
25											
30											
35											

LEGEND

2" PVC WELL SCREEN - 0.01" SLOTS

SILICA SAND FILTER PACK

BENTONITE SEAL

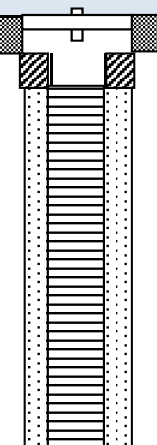
CONCRETE SEAL

REMARKS:

Set 10' 0.10" slot screen 12'-2', solid riser to grade; flush road box at grade set in concrete.
sand 12-2'; bentonite seal to 1'; cuttings to grade w/ 1' concrete seal

B-11-11' 11-12' 12:30 EPH & 14 metals (9/26/2017)

OHI-11

OHI Engineering, Inc. 110 Pulpit Hill Road Amherst, MA 01002 (413) 835-0780						PROJECT: Eastern Etching & Mfg, Inc. LOCATION: 35 Lower Grape St, Chicopee MA Project No.: 15-1700 Drilling Co.: Martin GeoEnvironmental		BORING NO.: OHI-12 SHEET NO.: 1 of 1 DATE: 9/26/2017 OHI Engineer/Geolo: WLW	
GROUNDWATER READINGS				CASING		SAMPLER		CORE BARREL	
DATE	TIME	DEPTH	TYPE & I.D.		GeoProbe	Jeremy & Chris		G.S. ELEVATION:	
			HAMMER WT.				DATUM:		
			HAMMER FALL				LOCATION:		
DEPTH	C.B. ALLOWING	SAMPLE COLLECTION DATA				SAMPLE DESCRIPTION	WELL CONSTRUCTION	STRATUM DESCRIPTION	
		PID	PEN/REC	DEPTH (ft)					
5						Asphalt		Fill material	
						14" tan, F Sand			
						3" concrete rubble			
	0.0	60/60			8" brown F-C sand and gravel				
					6" crushed brick				
					6" crushed concrete	To 7'			
0.0				14" red F-M sand, dry					
					9-8' brown F-M sand				
					8-12' black FS and silt, strong petrol odor				
					12-14' black F-CS and gravel, some ash and brick, strong petrol odor				
10						14-15' red brown gravel in matrix of silt, septic odor, wet			
15		308	60/54		B-12-12'	EOB at 15'			
					E,M				
		34							
20									
25									
30									
35									

LEGEND


2" PVC WELL SCREEN - 0.01" SLOTS


SILICA SAND FILTER PACK


BENTONITE SEAL

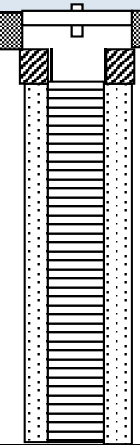
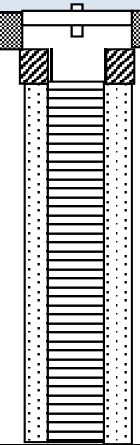
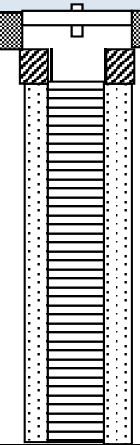
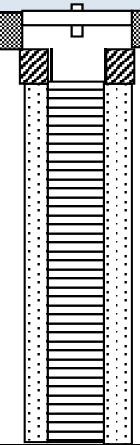
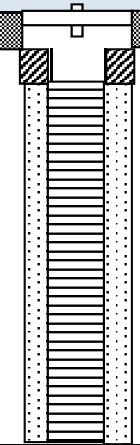
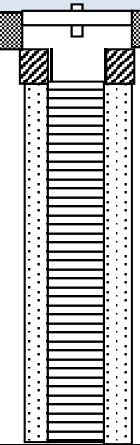
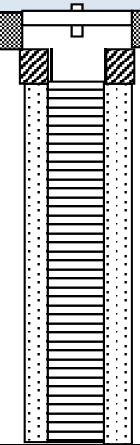

CONCRETE SEAL

REMARKS:

Set 10' 0.10" slot screen 12'-2'; solid riser to grade; flush road box at grade set in concrete.
 sand 12-2'; bentonite seal to 1'; cuttings to grade w/ 1' concrete seal

B-12-12' 12-14 2:00 EPH & 14 metals (9/26/2017)

OHI-12

OHI Engineering, Inc. 110 Pulpit Hill Road Amherst, MA 01002 (413) 835-0780						PROJECT: Eastern Etching & Mfg, Inc. LOCATION: 35 Lower Grape St, Chicopee MA Project No.: 15-1700 Drilling Co.: Martin GeoEnvironmental		BORING NO.: OHI-13 SHEET NO.: 1 of 1 DATE: 9/26/2017 OHI Engineer/Geolo: WLW	
GROUNDWATER READINGS				CASING		SAMPLER		CORE BARREL	
DATE	TIME	DEPTH	TYPE & I.D.		GeoProbe		Jeremy & Chris		G.S. ELEVATION: DATUM: LOCATION: SE of OHI 1-12 NW corner of machine shop
			HAMMER WT.						
			HAMMER FALL						
DEPTH	C.B. ALLOWING	SAMPLE COLLECTION DATA				SAMPLE DESCRIPTION		WELL CONSTRUCTION	STRATUM DESCRIPTION
		PID	PEN/REC	DEPTH (ft)					
5						Asphalt			Fill material
						Brown, F-C sand, gravel, ash, coal, loose, dry			
		0.0							
						B-13-4'			
						coal, M			
		0.0				brown, F-C sand and gravel, dry			
		2.0		7-9		Black, F-C sand, silt, wet, no odor, and brown			
						black F-C sand and gravel, petroleum odor			
10									Fill material
15						black, gravel, heavy petroleum odor, wet			Fill material
		50							
20						black, FC sand and gravel, some brick, heavy petrol odor			Fill material
25						EOB at 15'			Fill material
30									Fill material
35									Fill material

LEGEND


2" PVC WELL SCREEN - 0.01" SLOTS


SILICA SAND FILTER PACK


BENTONITE SEAL


CONCRETE SEAL

REMARKS:

Set 10' 0.10" slot screen 12'-2', solid riser to grade; flush road box at grade set in concrete. sand 12'-2'; bentonite seal to 1'; cuttings to grade w/ 1' concrete seal

B-12-12' 12-14 2:00 EPH & 14 metals (9/26/2017)

OHI-13

APPENDIX H

Laboratory Reports

October 11, 2017

Lyons Witten
OHI Engineering, Inc. - Amherst
110 Pulpit Hill Road
Amherst, MA 01002

Project Location: EEM-Chicopee
Client Job Number:
Project Number: 15-1700
Laboratory Work Order Number: 17I1251

Enclosed are results of analyses for samples received by the laboratory on September 27, 2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "James Georgantas". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

James M. Georgantas
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

OHI Engineering, Inc. - Amherst
110 Pulpit Hill Road
Amherst, MA 01002
ATTN: Lyons Witten

REPORT DATE: 10/11/2017

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 15-1700

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 1711251

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: EEM-Chicopee

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
B-10-5'	1711251-01	Soil		SM 2540G SW-846 6010C-D SW-846 7471B	
B-10-7'	1711251-02	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010C-D SW-846 7471B	
B-10-12'	1711251-03	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010C-D SW-846 7471B	
B-9-12'	1711251-04	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010C-D SW-846 7471B	
B-2A-5'	1711251-05	Soil		SM 2540G SW-846 6010C-D SW-846 7471B	
B-3A-4	1711251-06	Soil		SM 2540G SW-846 6010C-D SW-846 7471B	
B-4A-4'	1711251-07	Soil		SM 2540G SW-846 6010C-D SW-846 7471B	
B-11-11'	1711251-08	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010C-D SW-846 7471B	
B-12-12'	1711251-09	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010C-D SW-846 7471B	
B-8-3'	1711251-10	Soil		SM 2540G SW-846 6010C-D SW-846 7471B	
B-7A-3'	1711251-11	Soil		SM 2540G SW-846 6010C-D SW-846 7471B	
B-5A-3'	1711251-12	Soil		SM 2540G SW-846 6010C-D SW-846 7471B	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

OHI Engineering, Inc. - Amherst
110 Pulpit Hill Road
Amherst, MA 01002
ATTN: Lyons Witten

REPORT DATE: 10/11/2017

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 15-1700

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 1711251

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: EEM-Chicopee

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
B-13-4'	1711251-13	Soil		SM 2540G SW-846 6010C-D SW-846 7471B	
B-13-14'	1711251-14	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010C-D SW-846 7471B	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

MADEP-EPH-04-1.1**Qualifications:****L-07A**

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD outside of control limits. Reduced precision anticipated for any reported result for this compound.

Analyte & Samples(s) Qualified:**n-Decane**

B187543-BSD1

n-Nonane

B187543-BSD1

R-05

Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.

Analyte & Samples(s) Qualified:**n-Decane**

B187543-BLK1, B187543-BS1

n-Nonane

B187543-BLK1, B187543-BS1

S-15

Surrogate recovery outside of control limits due to suspected sample matrix interference. Chromatogram(s) is attached.

Analyte & Samples(s) Qualified:**2-Fluorobiphenyl**

1711251-08[B-11-11'], 1711251-09[B-12-12']

SW-846 6010C-D**Qualifications:****DL-04**

Elevated reporting limit due to high concentration of an interfering analyte(s).

Analyte & Samples(s) Qualified:**Silver**

1711251-02[B-10-7'], 1711251-04[B-9-12']

MS-07

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possibility of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:**Antimony**

1711251-01[B-10-5'], B187639-MS1

MS-19

Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.

Analyte & Samples(s) Qualified:**Barium**

1711251-01[B-10-5'], B187639-MS1

Lead

1711251-01[B-10-5'], B187639-MS1

Zinc

1711251-01[B-10-5'], B187639-MS1

R-02

Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.

Analyte & Samples(s) Qualified:**Cadmium**

1711251-01[B-10-5'], B187639-DUP1

Zinc

1711251-01[B-10-5'], B187639-DUP1

SW-846 7471B**Qualifications:**

MS-07

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possibility of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:**Mercury**

1711251-01[B-10-5'], B187640-MS1

MADEP-EPH-04-1.1

SPE cartridge contamination with non-petroleum compounds, if present, is verified by GC/MS in each method blank per extraction batch and excluded from C 11-C22 aromatic range fraction in all samples in the batch. No significant modifications were made to the method.

SW-846 6010C/D SW-846 6020A/B

For NC, Metals methods SW-846 6010D and SW-846 6020B are followed, and for all other states methods SW-846 6010C and SW-846 6020A are followed.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

A handwritten signature in black ink, appearing to read "Tod Kopycinski", with a stylized flourish at the end.

Tod E. Kopycinski
Laboratory Director

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-10-5'

Sampled: 9/26/2017 08:40

Sample ID: 1711251-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.6	mg/Kg dry	1	MS-07	SW-846 6010C-D	10/3/17	10/4/17 18:34	QNW
Arsenic	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:34	QNW
Barium	120	2.6	mg/Kg dry	1	MS-19	SW-846 6010C-D	10/3/17	10/4/17 18:34	QNW
Beryllium	ND	0.26	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:34	QNW
Cadmium	1.1	0.26	mg/Kg dry	1	R-02	SW-846 6010C-D	10/3/17	10/4/17 18:34	QNW
Chromium	23	0.52	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:34	QNW
Lead	120	0.79	mg/Kg dry	1	MS-19	SW-846 6010C-D	10/3/17	10/5/17 13:28	QNW
Mercury	0.22	0.027	mg/Kg dry	1	MS-07	SW-846 7471B	10/3/17	10/4/17 9:11	TJK
Nickel	14	0.52	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:34	QNW
Selenium	ND	5.2	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:34	QNW
Silver	ND	0.52	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:28	QNW
Thallium	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:28	QNW
Vanadium	18	1.0	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:34	QNW
Zinc	500	1.0	mg/Kg dry	1	R-02, MS-19	SW-846 6010C-D	10/3/17	10/4/17 18:34	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-10-5'

Sampled: 9/26/2017 08:40

Sample ID: 1711251-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	93.1		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-10-7'

Sampled: 9/26/2017 08:45

Sample ID: 1711251-02

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	8700	940	mg/Kg dry	80		MADEP-EPH-04-1.1	10/2/17	10/6/17 16:05	PJG
C19-C36 Aliphatics	950	120	mg/Kg dry	10		MADEP-EPH-04-1.1	10/2/17	10/6/17 16:25	PJG
Unadjusted C11-C22 Aromatics	1300	120	mg/Kg dry	10		MADEP-EPH-04-1.1	10/2/17	10/6/17 16:05	PJG
C11-C22 Aromatics	1300	120	mg/Kg dry	10		MADEP-EPH-04-1.1	10/2/17	10/6/17 16:05	PJG
Acenaphthene	3.8	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Acenaphthylene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Benzo(a)anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Benzo(a)pyrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Benzo(b)fluoranthene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Benzo(g,h,i)perylene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Benzo(k)fluoranthene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Chrysene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Dibenz(a,h)anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Fluoranthene	0.42	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Fluorene	6.3	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Indeno(1,2,3-cd)pyrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
2-Methylnaphthalene	4.3	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Naphthalene	3.1	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Phenanthrene	3.2	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Pyrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:35	PJG
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	67.3	40-140							
o-Terphenyl (OTP)	85.5	40-140							
2-Bromonaphthalene	66.5	40-140							
2-Fluorobiphenyl	73.5	40-140							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-10-7'

Sampled: 9/26/2017 08:45

Sample ID: 1711251-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	26	2.8	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:38	QNW
Arsenic	5.1	2.8	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:38	QNW
Barium	84	2.8	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:38	QNW
Beryllium	ND	0.28	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:38	QNW
Cadmium	0.84	0.28	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:38	QNW
Chromium	22	0.56	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:38	QNW
Lead	310	0.83	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:34	QNW
Mercury	0.25	0.029	mg/Kg dry	1		SW-846 7471B	10/3/17	10/4/17 9:12	TJK
Nickel	49	0.56	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:38	QNW
Selenium	ND	5.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:38	QNW
Silver	ND	2.8	mg/Kg dry	5	DL-04	SW-846 6010C-D	10/3/17	10/5/17 16:20	QNW
Thallium	ND	2.8	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:38	QNW
Vanadium	25	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:38	QNW
Zinc	200	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:38	QNW

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-10-7'

Sampled: 9/26/2017 08:45

Sample ID: 1711251-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	84.3		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-10-12'

Sampled: 9/26/2017 08:50

Sample ID: 1711251-03

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	480	110	mg/Kg dry	4		MADEP-EPH-04-1.1	10/2/17	10/6/17 16:45	PJG
C19-C36 Aliphatics	70	27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Unadjusted C11-C22 Aromatics	260	27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
C11-C22 Aromatics	250	27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Acenaphthene	0.75	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Acenaphthylene	ND	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Anthracene	ND	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Benzo(a)anthracene	ND	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Benzo(a)pyrene	ND	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Benzo(b)fluoranthene	ND	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Benzo(g,h,i)perylene	ND	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Benzo(k)fluoranthene	ND	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Chrysene	ND	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Dibenz(a,h)anthracene	ND	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Fluoranthene	ND	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Fluorene	1.4	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Indeno(1,2,3-cd)pyrene	ND	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
2-Methylnaphthalene	4.2	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Naphthalene	5.7	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Phenanthrene	0.87	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Pyrene	ND	0.27	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 16:55	PJG
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	43.7	40-140							
o-Terphenyl (OTP)	52.7	40-140							
2-Bromonaphthalene	64.6	40-140							
2-Fluorobiphenyl	83.0	40-140							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-10-12'

Sampled: 9/26/2017 08:50

Sample ID: 1711251-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	3.4	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:50	QNW
Arsenic	6.7	3.4	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:50	QNW
Barium	39	3.4	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:50	QNW
Beryllium	ND	0.34	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:50	QNW
Cadmium	0.58	0.34	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:50	QNW
Chromium	23	0.68	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:50	QNW
Lead	34	1.0	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:39	QNW
Mercury	0.35	0.034	mg/Kg dry	1		SW-846 7471B	10/3/17	10/4/17 9:14	TJK
Nickel	34	0.68	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:50	QNW
Selenium	ND	6.8	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:50	QNW
Silver	ND	0.68	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:39	QNW
Thallium	ND	3.4	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:39	QNW
Vanadium	16	1.4	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:50	QNW
Zinc	65	1.4	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:50	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-10-12'

Sampled: 9/26/2017 08:50

Sample ID: 1711251-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	73.3		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-9-12'

Sampled: 9/26/2017 10:15

Sample ID: 1711251-04

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	210	58	mg/Kg dry	5		MADEP-EPH-04-1.1	10/6/17	10/11/17 10:45	CJM
C19-C36 Aliphatics	34	12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Unadjusted C11-C22 Aromatics	65	12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
C11-C22 Aromatics	65	12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Acenaphthene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Acenaphthylene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Benzo(a)anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Benzo(a)pyrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Benzo(b)fluoranthene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Benzo(g,h,i)perylene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Benzo(k)fluoranthene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Chrysene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Dibenz(a,h)anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Fluoranthene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Fluorene	0.18	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Indeno(1,2,3-cd)pyrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
2-Methylnaphthalene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Naphthalene	0.27	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Phenanthrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Pyrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:27	CJM
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	57.2	40-140							
o-Terphenyl (OTP)	68.9	40-140							
2-Bromonaphthalene	90.5	40-140							
2-Fluorobiphenyl	104	40-140							

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-9-12'

Sampled: 9/26/2017 10:15

Sample ID: 1711251-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:53	QNW
Arsenic	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:53	QNW
Barium	34	2.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:53	QNW
Beryllium	ND	0.27	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:53	QNW
Cadmium	ND	0.27	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:53	QNW
Chromium	18	0.54	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:53	QNW
Lead	24	0.81	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:44	QNW
Mercury	ND	0.029	mg/Kg dry	1		SW-846 7471B	10/3/17	10/4/17 9:15	TJK
Nickel	18	0.54	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:53	QNW
Selenium	ND	5.4	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:53	QNW
Silver	ND	1.1	mg/Kg dry	2	DL-04	SW-846 6010C-D	10/3/17	10/5/17 16:25	QNW
Thallium	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:44	QNW
Vanadium	54	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:53	QNW
Zinc	33	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:53	QNW

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-9-12'

Sampled: 9/26/2017 10:15

Sample ID: 1711251-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.8		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-2A-5'

Sampled: 9/26/2017 11:15

Sample ID: 1711251-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:57	QNW
Arsenic	3.3	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:49	QNW
Barium	49	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:57	QNW
Beryllium	ND	0.26	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:57	QNW
Cadmium	ND	0.26	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:57	QNW
Chromium	21	0.52	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:57	QNW
Lead	31	0.78	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:49	QNW
Mercury	0.097	0.026	mg/Kg dry	1		SW-846 7471B	10/3/17	10/4/17 9:17	TJK
Nickel	20	0.52	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:57	QNW
Selenium	ND	5.2	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:57	QNW
Silver	ND	0.52	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:49	QNW
Thallium	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:49	QNW
Vanadium	34	1.0	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:57	QNW
Zinc	67	1.0	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 18:57	QNW

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-2A-5'

Sampled: 9/26/2017 11:15

Sample ID: 1711251-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.8		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-3A-4

Sampled: 9/26/2017 11:20

Sample ID: 1711251-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.9	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:00	QNW
Arsenic	12	2.9	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:00	QNW
Barium	130	2.9	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:00	QNW
Beryllium	ND	0.29	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:00	QNW
Cadmium	0.96	0.29	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:00	QNW
Chromium	12	0.57	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:00	QNW
Lead	180	0.86	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:55	QNW
Mercury	0.13	0.029	mg/Kg dry	1		SW-846 7471B	10/3/17	10/4/17 9:23	TJK
Nickel	32	0.57	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:00	QNW
Selenium	ND	5.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:00	QNW
Silver	ND	0.57	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 13:55	QNW
Thallium	ND	2.9	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:00	QNW
Vanadium	18	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:00	QNW
Zinc	190	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:00	QNW

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-3A-4

Sampled: 9/26/2017 11:20

Sample ID: 1711251-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	85.9		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-4A-4'

Sampled: 9/26/2017 11:35

Sample ID: 1711251-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:04	QNW
Arsenic	11	2.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:04	QNW
Barium	98	2.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:04	QNW
Beryllium	ND	0.27	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:04	QNW
Cadmium	0.97	0.27	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:04	QNW
Chromium	11	0.54	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:04	QNW
Lead	1000	0.80	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 14:00	QNW
Mercury	0.064	0.029	mg/Kg dry	1		SW-846 7471B	10/3/17	10/4/17 9:24	TJK
Nickel	27	0.54	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:04	QNW
Selenium	ND	5.4	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:04	QNW
Silver	ND	0.54	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 14:00	QNW
Thallium	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 14:00	QNW
Vanadium	20	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:04	QNW
Zinc	660	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:04	QNW

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Sampled: 9/26/2017 11:35

Field Sample #: B-4A-4'

Sample ID: 1711251-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	86.4		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-11-11'

Sampled: 9/26/2017 12:30

Sample ID: 1711251-08

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	1000	120	mg/Kg dry	10		MADEP-EPH-04-1.1	10/2/17	10/6/17 17:25	PJG
C19-C36 Aliphatics	110	12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Unadjusted C11-C22 Aromatics	350	12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
C11-C22 Aromatics	340	12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Acenaphthene	0.65	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Acenaphthylene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Benzo(a)anthracene	0.40	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Benzo(a)pyrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Benzo(b)fluoranthene	0.23	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Benzo(g,h,i)perylene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Benzo(k)fluoranthene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Chrysene	0.26	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Dibenz(a,h)anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Fluoranthene	0.46	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Fluorene	1.2	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Indeno(1,2,3-cd)pyrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
2-Methylnaphthalene	3.2	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Naphthalene	1.8	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Phenanthrene	1.0	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG
Pyrene	0.32	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:35	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	45.0	40-140	
o-Terphenyl (OTP)	57.5	40-140	
2-Bromonaphthalene	127	40-140	
2-Fluorobiphenyl	162 *	40-140	S-15

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-11-11'

Sampled: 9/26/2017 12:30

Sample ID: 1711251-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	3.0	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:07	QNW
Arsenic	ND	3.0	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:07	QNW
Barium	66	3.0	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:07	QNW
Beryllium	ND	0.30	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:07	QNW
Cadmium	3.3	0.30	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:07	QNW
Chromium	13	0.59	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:07	QNW
Lead	230	0.89	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 14:06	QNW
Mercury	0.89	0.12	mg/Kg dry	4		SW-846 7471B	10/3/17	10/4/17 11:03	TJK
Nickel	16	0.59	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:07	QNW
Selenium	ND	5.9	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:07	QNW
Silver	ND	0.59	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 14:06	QNW
Thallium	ND	3.0	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 14:06	QNW
Vanadium	20	1.2	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:07	QNW
Zinc	920	1.2	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:07	QNW

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-11-11'

Sampled: 9/26/2017 12:30

Sample ID: 1711251-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	82.8		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-12-12'

Sampled: 9/26/2017 14:00

Sample ID: 1711251-09

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	2200	260	mg/Kg dry	20		MADEP-EPH-04-1.1	10/2/17	10/6/17 17:45	PJG
C19-C36 Aliphatics	330	53	mg/Kg dry	4		MADEP-EPH-04-1.1	10/2/17	10/6/17 18:06	PJG
Unadjusted C11-C22 Aromatics	890	66	mg/Kg dry	5		MADEP-EPH-04-1.1	10/2/17	10/6/17 17:45	PJG
C11-C22 Aromatics	860	66	mg/Kg dry	5		MADEP-EPH-04-1.1	10/2/17	10/6/17 17:45	PJG
Acenaphthene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Acenaphthylene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Anthracene	0.55	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Benzo(a)anthracene	0.29	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Benzo(a)pyrene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Benzo(b)fluoranthene	1.1	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Benzo(g,h,i)perylene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Benzo(k)fluoranthene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Chrysene	0.36	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Dibenz(a,h)anthracene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Fluoranthene	0.76	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Fluorene	4.1	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Indeno(1,2,3-cd)pyrene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
2-Methylnaphthalene	12	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Naphthalene	3.4	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Phenanthrene	3.1	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Pyrene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	10/2/17	10/5/17 17:55	PJG
Surrogates	% Recovery		Recovery Limits		Flag/Qual				
Chlorooctadecane (COD)	53.0		40-140				10/5/17 17:55		
o-Terphenyl (OTP)	58.2		40-140				10/5/17 17:55		
2-Bromonaphthalene	111		40-140				10/5/17 17:55		
2-Fluorobiphenyl	168		40-140		S-15		10/5/17 17:55		

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-12-12'

Sampled: 9/26/2017 14:00

Sample ID: 1711251-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	130	3.2	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:10	QNW
Arsenic	ND	3.2	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:10	QNW
Barium	64	3.2	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:10	QNW
Beryllium	ND	0.32	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:10	QNW
Cadmium	0.82	0.32	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:10	QNW
Chromium	15	0.65	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:10	QNW
Lead	290	0.97	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 14:12	QNW
Mercury	3.1	0.33	mg/Kg dry	10		SW-846 7471B	10/3/17	10/4/17 11:05	TJK
Nickel	26	0.65	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:10	QNW
Selenium	ND	6.5	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:10	QNW
Silver	ND	0.65	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 14:12	QNW
Thallium	ND	3.2	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 14:12	QNW
Vanadium	23	1.3	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:10	QNW
Zinc	350	1.3	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:10	QNW

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-12-12'

Sampled: 9/26/2017 14:00

Sample ID: 1711251-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	75.5		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-8-3'

Sampled: 9/26/2017 14:45

Sample ID: 1711251-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:14	QNW
Arsenic	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:14	QNW
Barium	260	2.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:14	QNW
Beryllium	ND	0.27	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:14	QNW
Cadmium	0.74	0.27	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:14	QNW
Chromium	21	0.54	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:14	QNW
Lead	340	0.80	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 14:17	QNW
Mercury	1.4	0.14	mg/Kg dry	5		SW-846 7471B	10/3/17	10/4/17 11:06	TJK
Nickel	16	0.54	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:14	QNW
Selenium	ND	5.4	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:14	QNW
Silver	ND	0.54	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 14:17	QNW
Thallium	ND	2.7	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 14:17	QNW
Vanadium	29	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:14	QNW
Zinc	1200	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:14	QNW

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-8-3'

Sampled: 9/26/2017 14:45

Sample ID: 1711251-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.9		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-7A-3'

Sampled: 9/26/2017 15:15

Sample ID: 1711251-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.9	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:17	QNW
Arsenic	5.2	2.9	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:17	QNW
Barium	81	2.9	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:17	QNW
Beryllium	ND	0.29	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:17	QNW
Cadmium	0.51	0.29	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:17	QNW
Chromium	13	0.58	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:17	QNW
Lead	110	0.88	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:05	QNW
Mercury	0.18	0.030	mg/Kg dry	1		SW-846 7471B	10/3/17	10/4/17 9:31	TJK
Nickel	17	0.58	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:17	QNW
Selenium	ND	5.8	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:17	QNW
Silver	ND	0.58	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:05	QNW
Thallium	ND	2.9	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:17	QNW
Vanadium	23	1.2	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:17	QNW
Zinc	110	1.2	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:17	QNW

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Sampled: 9/26/2017 15:15

Field Sample #: B-7A-3'

Sample ID: 1711251-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	83.3		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-5A-3'

Sampled: 9/26/2017 15:25

Sample ID: 1711251-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:21	QNW
Arsenic	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:21	QNW
Barium	49	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:21	QNW
Beryllium	ND	0.26	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:21	QNW
Cadmium	ND	0.26	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:21	QNW
Chromium	12	0.53	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:21	QNW
Lead	37	0.79	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:10	QNW
Mercury	0.16	0.027	mg/Kg dry	1		SW-846 7471B	10/3/17	10/4/17 9:32	TJK
Nickel	9.1	0.53	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:21	QNW
Selenium	ND	5.3	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:21	QNW
Silver	ND	0.53	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:10	QNW
Thallium	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:21	QNW
Vanadium	14	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:21	QNW
Zinc	45	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:21	QNW

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-5A-3'

Sampled: 9/26/2017 15:25

Sample ID: 1711251-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	92.8		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-13-4'

Sampled: 9/26/2017 15:45

Sample ID: 1711251-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW
Arsenic	2.8	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW
Barium	53	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW
Beryllium	ND	0.26	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW
Cadmium	0.45	0.26	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW
Chromium	9.0	0.52	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW
Lead	59	0.78	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW
Mercury	0.082	0.028	mg/Kg dry	1		SW-846 7471B	10/3/17	10/4/17 9:34	TJK
Nickel	14	0.52	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW
Selenium	ND	5.2	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW
Silver	0.55	0.52	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW
Thallium	3.0	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW
Vanadium	16	1.0	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW
Zinc	420	1.0	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:16	QNW

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-13-4'

Sampled: 9/26/2017 15:45

Sample ID: 1711251-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.2		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-13-14'

Sampled: 9/26/2017 16:05

Sample ID: 1711251-14

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	20	11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
C19-C36 Aliphatics	25	11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Unadjusted C11-C22 Aromatics	14	11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
C11-C22 Aromatics	14	11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Benzo(b)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Phenanthrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	10/6/17	10/9/17 14:46	CJM
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	53.5	40-140							
o-Terphenyl (OTP)	62.1	40-140							
2-Bromonaphthalene	95.9	40-140							
2-Fluorobiphenyl	108	40-140							

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-13-14'

Sampled: 9/26/2017 16:05

Sample ID: 1711251-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/4/17 19:36	QNW
Arsenic	6.6	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:21	QNW
Barium	42	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:21	QNW
Beryllium	ND	0.26	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:21	QNW
Cadmium	ND	0.26	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:21	QNW
Chromium	14	0.53	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:21	QNW
Lead	210	0.79	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:21	QNW
Mercury	ND	0.028	mg/Kg dry	1		SW-846 7471B	10/3/17	10/4/17 9:36	TJK
Nickel	21	0.53	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:21	QNW
Selenium	ND	5.3	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:21	QNW
Silver	ND	0.53	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:21	QNW
Thallium	4.3	2.6	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:21	QNW
Vanadium	26	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:21	QNW
Zinc	99	1.1	mg/Kg dry	1		SW-846 6010C-D	10/3/17	10/5/17 15:21	QNW

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Project Location: EEM-Chicopee

Sample Description:

Work Order: 1711251

Date Received: 9/27/2017

Field Sample #: B-13-14'

Sampled: 9/26/2017 16:05

Sample ID: 1711251-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.2		% Wt	1		SM 2540G	9/29/17	10/2/17 8:31	MRL

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Sample Extraction Data

Prep Method: SW-846 3546-MADEP-EPH-04-1.1

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17I1251-02 [B-10-7']	B187543	20.1	2.00	10/02/17
17I1251-03 [B-10-12']	B187543	10.1	2.00	10/02/17
17I1251-08 [B-11-11']	B187543	20.1	2.00	10/02/17
17I1251-09 [B-12-12']	B187543	20.0	2.00	10/02/17

Prep Method: SW-846 3546-MADEP-EPH-04-1.1

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17I1251-04RE1 [B-9-12']	B187998	20.0	2.00	10/06/17
17I1251-14RE1 [B-13-14']	B187998	20.1	2.00	10/06/17

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
17I1251-01 [B-10-5']	B187377	09/29/17
17I1251-02 [B-10-7']	B187377	09/29/17
17I1251-03 [B-10-12']	B187377	09/29/17
17I1251-04 [B-9-12']	B187377	09/29/17
17I1251-05 [B-2A-5']	B187377	09/29/17
17I1251-06 [B-3A-4']	B187377	09/29/17
17I1251-07 [B-4A-4']	B187377	09/29/17
17I1251-08 [B-11-11']	B187377	09/29/17
17I1251-09 [B-12-12']	B187377	09/29/17
17I1251-10 [B-8-3']	B187377	09/29/17
17I1251-11 [B-7A-3']	B187377	09/29/17
17I1251-12 [B-5A-3']	B187377	09/29/17
17I1251-13 [B-13-4']	B187377	09/29/17
17I1251-14 [B-13-14']	B187377	09/29/17

Prep Method: SW-846 3050B-SW-846 6010C-D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17I1251-01 [B-10-5']	B187639	1.02	50.0	10/03/17
17I1251-02 [B-10-7']	B187639	1.07	50.0	10/03/17
17I1251-03 [B-10-12']	B187639	1.01	50.0	10/03/17
17I1251-04 [B-9-12']	B187639	1.08	50.0	10/03/17
17I1251-05 [B-2A-5']	B187639	1.05	50.0	10/03/17
17I1251-06 [B-3A-4']	B187639	1.02	50.0	10/03/17
17I1251-07 [B-4A-4']	B187639	1.08	50.0	10/03/17
17I1251-08 [B-11-11']	B187639	1.02	50.0	10/03/17
17I1251-09 [B-12-12']	B187639	1.03	50.0	10/03/17
17I1251-10 [B-8-3']	B187639	1.05	50.0	10/03/17
17I1251-11 [B-7A-3']	B187639	1.03	50.0	10/03/17
17I1251-12 [B-5A-3']	B187639	1.02	50.0	10/03/17
17I1251-13 [B-13-4']	B187639	1.07	50.0	10/03/17
17I1251-14 [B-13-14']	B187639	1.07	50.0	10/03/17

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332**Sample Extraction Data****Prep Method: SW-846 7471-SW-846 7471B**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17I1251-01 [B-10-5']	B187640	0.604	50.0	10/03/17
17I1251-02 [B-10-7']	B187640	0.609	50.0	10/03/17
17I1251-03 [B-10-12']	B187640	0.603	50.0	10/03/17
17I1251-04 [B-9-12']	B187640	0.612	50.0	10/03/17
17I1251-05 [B-2A-5']	B187640	0.619	50.0	10/03/17
17I1251-06 [B-3A-4']	B187640	0.610	50.0	10/03/17
17I1251-07 [B-4A-4']	B187640	0.601	50.0	10/03/17
17I1251-08 [B-11-11']	B187640	0.600	50.0	10/03/17
17I1251-09 [B-12-12']	B187640	0.602	50.0	10/03/17
17I1251-10 [B-8-3']	B187640	0.614	50.0	10/03/17
17I1251-11 [B-7A-3']	B187640	0.601	50.0	10/03/17
17I1251-12 [B-5A-3']	B187640	0.601	50.0	10/03/17
17I1251-13 [B-13-4']	B187640	0.600	50.0	10/03/17
17I1251-14 [B-13-14']	B187640	0.615	50.0	10/03/17

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QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B187543 - SW-846 3546
Blank (B187543-BLK1)

Prepared: 10/02/17 Analyzed: 10/05/17

C9-C18 Aliphatics	ND	10	mg/Kg wet							
C19-C36 Aliphatics	ND	10	mg/Kg wet							
Unadjusted C11-C22 Aromatics	ND	10	mg/Kg wet							
C11-C22 Aromatics	ND	10	mg/Kg wet							
Acenaphthene	ND	0.10	mg/Kg wet							
Acenaphthylene	ND	0.10	mg/Kg wet							
Anthracene	ND	0.10	mg/Kg wet							
Benzo(a)anthracene	ND	0.10	mg/Kg wet							
Benzo(a)pyrene	ND	0.10	mg/Kg wet							
Benzo(b)fluoranthene	ND	0.10	mg/Kg wet							
Benzo(g,h,i)perylene	ND	0.10	mg/Kg wet							
Benzo(k)fluoranthene	ND	0.10	mg/Kg wet							
Chrysene	ND	0.10	mg/Kg wet							
Dibenz(a,h)anthracene	ND	0.10	mg/Kg wet							
Fluoranthene	ND	0.10	mg/Kg wet							
Fluorene	ND	0.10	mg/Kg wet							
Indeno(1,2,3-cd)pyrene	ND	0.10	mg/Kg wet							
2-Methylnaphthalene	ND	0.10	mg/Kg wet							
Naphthalene	ND	0.10	mg/Kg wet							
Phenanthrene	ND	0.10	mg/Kg wet							
Pyrene	ND	0.10	mg/Kg wet							
n-Decane	ND	0.10	mg/Kg wet							R-05
n-Docosane	ND	0.10	mg/Kg wet							
n-Dodecane	ND	0.10	mg/Kg wet							
n-Eicosane	ND	0.10	mg/Kg wet							
n-Hexacosane	ND	0.10	mg/Kg wet							
n-Hexadecane	ND	0.10	mg/Kg wet							
n-Hexatriacontane	ND	0.10	mg/Kg wet							
n-Nonadecane	ND	0.10	mg/Kg wet							
n-Nonane	ND	0.10	mg/Kg wet							R-05
n-Octacosane	ND	0.10	mg/Kg wet							
n-Octadecane	ND	0.10	mg/Kg wet							
n-Tetracosane	ND	0.10	mg/Kg wet							
n-Tetradecane	ND	0.10	mg/Kg wet							
n-Triacontane	ND	0.10	mg/Kg wet							
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet							
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet							
Surrogate: Chlorooctadecane (COD)	2.43		mg/Kg wet	4.99		48.7	40-140			
Surrogate: o-Terphenyl (OTP)	2.82		mg/Kg wet	5.00		56.4	40-140			
Surrogate: 2-Bromonaphthalene	3.12		mg/Kg wet	5.00		62.4	40-140			
Surrogate: 2-Fluorobiphenyl	3.81		mg/Kg wet	5.00		76.1	40-140			

LCS (B187543-BS1)

Prepared: 10/02/17 Analyzed: 10/05/17

C9-C18 Aliphatics	25.7	10	mg/Kg wet	30.0		85.8	40-140			
C19-C36 Aliphatics	35.1	10	mg/Kg wet	40.0		87.7	40-140			
Acenaphthene	3.46	0.10	mg/Kg wet	5.00		69.2	40-140			
Acenaphthylene	3.22	0.10	mg/Kg wet	5.00		64.4	40-140			
Anthracene	3.54	0.10	mg/Kg wet	5.00		70.8	40-140			
Benzo(a)anthracene	3.47	0.10	mg/Kg wet	5.00		69.5	40-140			
Benzo(a)pyrene	3.35	0.10	mg/Kg wet	5.00		67.1	40-140			
Benzo(b)fluoranthene	3.45	0.10	mg/Kg wet	5.00		69.0	40-140			
Benzo(g,h,i)perylene	3.21	0.10	mg/Kg wet	5.00		64.1	40-140			

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QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B187543 - SW-846 3546										
LCS (B187543-BS1)										
					Prepared: 10/02/17 Analyzed: 10/05/17					
Benzo(k)fluoranthene	3.37	0.10	mg/Kg wet	5.00		67.4	40-140			
Chrysene	3.50	0.10	mg/Kg wet	5.00		70.0	40-140			
Dibenz(a,h)anthracene	3.28	0.10	mg/Kg wet	5.00		65.6	40-140			
Fluoranthene	3.51	0.10	mg/Kg wet	5.00		70.2	40-140			
Fluorene	3.46	0.10	mg/Kg wet	5.00		69.1	40-140			
Indeno(1,2,3-cd)pyrene	3.11	0.10	mg/Kg wet	5.00		62.1	40-140			
2-Methylnaphthalene	3.08	0.10	mg/Kg wet	5.00		61.6	40-140			
Naphthalene	2.99	0.10	mg/Kg wet	5.00		59.7	40-140			
Phenanthrene	3.44	0.10	mg/Kg wet	5.00		68.8	40-140			
Pyrene	3.53	0.10	mg/Kg wet	5.00		70.6	40-140			
n-Decane	2.46	0.10	mg/Kg wet	5.00		49.1	40-140			R-05
n-Docosane	3.34	0.10	mg/Kg wet	5.00		66.8	40-140			
n-Dodecane	2.98	0.10	mg/Kg wet	5.00		59.5	40-140			
n-Eicosane	3.37	0.10	mg/Kg wet	5.00		67.4	40-140			
n-Hexacosane	3.23	0.10	mg/Kg wet	5.00		64.6	40-140			
n-Hexadecane	3.53	0.10	mg/Kg wet	5.00		70.7	40-140			
n-Hexatriacontane	3.32	0.10	mg/Kg wet	5.00		66.4	40-140			
n-Nonadecane	3.34	0.10	mg/Kg wet	5.00		66.8	40-140			
n-Nonane	1.85	0.10	mg/Kg wet	5.00		37.1	30-140			R-05
n-Octacosane	3.14	0.10	mg/Kg wet	5.00		62.8	40-140			
n-Octadecane	3.69	0.10	mg/Kg wet	5.00		73.8	40-140			
n-Tetracosane	3.34	0.10	mg/Kg wet	5.00		66.9	40-140			
n-Tetradecane	3.40	0.10	mg/Kg wet	5.00		68.1	40-140			
n-Triacontane	3.20	0.10	mg/Kg wet	5.00		64.0	40-140			
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
Surrogate: Chlorooctadecane (COD)	2.92		mg/Kg wet	4.99		58.5	40-140			
Surrogate: o-Terphenyl (OTP)	3.56		mg/Kg wet	5.00		71.1	40-140			
Surrogate: 2-Bromonaphthalene	3.75		mg/Kg wet	5.00		74.9	40-140			
Surrogate: 2-Fluorobiphenyl	4.51		mg/Kg wet	5.00		90.2	40-140			
LCS Dup (B187543-BSD1)										
					Prepared: 10/02/17 Analyzed: 10/05/17					
C9-C18 Aliphatics	21.7	10	mg/Kg wet	30.0		72.4	40-140	17.0	25	
C19-C36 Aliphatics	30.8	10	mg/Kg wet	40.0		76.9	40-140	13.1	25	
Acenaphthene	2.99	0.10	mg/Kg wet	5.00		59.9	40-140	14.4	25	
Acenaphthylene	2.79	0.10	mg/Kg wet	5.00		55.9	40-140	14.3	25	
Anthracene	3.11	0.10	mg/Kg wet	5.00		62.2	40-140	13.0	25	
Benzo(a)anthracene	3.07	0.10	mg/Kg wet	5.00		61.4	40-140	12.3	25	
Benzo(a)pyrene	2.98	0.10	mg/Kg wet	5.00		59.5	40-140	11.9	25	
Benzo(b)fluoranthene	3.05	0.10	mg/Kg wet	5.00		61.0	40-140	12.4	25	
Benzo(g,h,i)perylene	2.82	0.10	mg/Kg wet	5.00		56.3	40-140	12.9	25	
Benzo(k)fluoranthene	3.01	0.10	mg/Kg wet	5.00		60.1	40-140	11.5	25	
Chrysene	3.11	0.10	mg/Kg wet	5.00		62.2	40-140	11.7	25	
Dibenz(a,h)anthracene	2.89	0.10	mg/Kg wet	5.00		57.9	40-140	12.6	25	
Fluoranthene	3.08	0.10	mg/Kg wet	5.00		61.6	40-140	13.0	25	
Fluorene	3.02	0.10	mg/Kg wet	5.00		60.4	40-140	13.5	25	
Indeno(1,2,3-cd)pyrene	2.72	0.10	mg/Kg wet	5.00		54.4	40-140	13.4	25	
2-Methylnaphthalene	2.66	0.10	mg/Kg wet	5.00		53.2	40-140	14.7	25	
Naphthalene	2.57	0.10	mg/Kg wet	5.00		51.4	40-140	15.0	25	
Phenanthrene	3.02	0.10	mg/Kg wet	5.00		60.4	40-140	13.1	25	
Pyrene	3.09	0.10	mg/Kg wet	5.00		61.9	40-140	13.1	25	
n-Decane	1.79	0.10	mg/Kg wet	5.00		35.8	* 40-140	31.4	* 25	L-07A

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QUALITY CONTROL

Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B187543 - SW-846 3546

LCS Dup (B187543-BSD1)

Prepared: 10/02/17 Analyzed: 10/05/17

n-Docosane	2.88	0.10	mg/Kg wet	5.00		57.5	40-140	14.8	25	
n-Dodecane	2.49	0.10	mg/Kg wet	5.00		49.9	40-140	17.6	25	
n-Eicosane	2.92	0.10	mg/Kg wet	5.00		58.3	40-140	14.5	25	
n-Hexacosane	2.76	0.10	mg/Kg wet	5.00		55.3	40-140	15.5	25	
n-Hexadecane	3.11	0.10	mg/Kg wet	5.00		62.3	40-140	12.7	25	
n-Hexatriacontane	2.84	0.10	mg/Kg wet	5.00		56.8	40-140	15.7	25	
n-Nonadecane	2.88	0.10	mg/Kg wet	5.00		57.5	40-140	14.8	25	
n-Nonane	1.12	0.10	mg/Kg wet	5.00		22.5	* 30-140	49.0	* 25	L-07A
n-Octacosane	2.69	0.10	mg/Kg wet	5.00		53.8	40-140	15.4	25	
n-Octadecane	3.19	0.10	mg/Kg wet	5.00		63.9	40-140	14.4	25	
n-Tetracosane	2.87	0.10	mg/Kg wet	5.00		57.3	40-140	15.3	25	
n-Tetradecane	2.92	0.10	mg/Kg wet	5.00		58.4	40-140	15.3	25	
n-Triacontane	2.75	0.10	mg/Kg wet	5.00		55.0	40-140	15.1	25	
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
Surrogate: Chlorooctadecane (COD)	2.47		mg/Kg wet	4.99		49.5	40-140			
Surrogate: o-Terphenyl (OTP)	3.00		mg/Kg wet	5.00		59.9	40-140			
Surrogate: 2-Bromonaphthalene	3.54		mg/Kg wet	5.00		70.7	40-140			
Surrogate: 2-Fluorobiphenyl	4.29		mg/Kg wet	5.00		85.7	40-140			

Batch B187998 - SW-846 3546

Blank (B187998-BLK1)

Prepared: 10/06/17 Analyzed: 10/09/17

C9-C18 Aliphatics	ND	10	mg/Kg wet							
C19-C36 Aliphatics	ND	10	mg/Kg wet							
Unadjusted C11-C22 Aromatics	ND	10	mg/Kg wet							
C11-C22 Aromatics	ND	10	mg/Kg wet							
Acenaphthene	ND	0.10	mg/Kg wet							
Acenaphthylene	ND	0.10	mg/Kg wet							
Anthracene	ND	0.10	mg/Kg wet							
Benzo(a)anthracene	ND	0.10	mg/Kg wet							
Benzo(a)pyrene	ND	0.10	mg/Kg wet							
Benzo(b)fluoranthene	ND	0.10	mg/Kg wet							
Benzo(g,h,i)perylene	ND	0.10	mg/Kg wet							
Benzo(k)fluoranthene	ND	0.10	mg/Kg wet							
Chrysene	ND	0.10	mg/Kg wet							
Dibenz(a,h)anthracene	ND	0.10	mg/Kg wet							
Fluoranthene	ND	0.10	mg/Kg wet							
Fluorene	ND	0.10	mg/Kg wet							
Indeno(1,2,3-cd)pyrene	ND	0.10	mg/Kg wet							
2-Methylnaphthalene	ND	0.10	mg/Kg wet							
Naphthalene	ND	0.10	mg/Kg wet							
Phenanthrene	ND	0.10	mg/Kg wet							
Pyrene	ND	0.10	mg/Kg wet							
n-Decane	ND	0.10	mg/Kg wet							
n-Docosane	ND	0.10	mg/Kg wet							
n-Dodecane	ND	0.10	mg/Kg wet							
n-Eicosane	ND	0.10	mg/Kg wet							
n-Hexacosane	ND	0.10	mg/Kg wet							
n-Hexadecane	ND	0.10	mg/Kg wet							
n-Hexatriacontane	ND	0.10	mg/Kg wet							
n-Nonadecane	ND	0.10	mg/Kg wet							
n-Nonane	ND	0.10	mg/Kg wet							

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QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B187998 - SW-846 3546										
Blank (B187998-BLK1)										
Prepared: 10/06/17 Analyzed: 10/09/17										
n-Octacosane	ND	0.10	mg/Kg wet							
n-Octadecane	ND	0.10	mg/Kg wet							
n-Tetracosane	ND	0.10	mg/Kg wet							
n-Tetradecane	ND	0.10	mg/Kg wet							
n-Triacontane	ND	0.10	mg/Kg wet							
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet							
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet							
Surrogate: Chlorooctadecane (COD)	3.42		mg/Kg wet	4.99		68.6	40-140			
Surrogate: o-Terphenyl (OTP)	3.77		mg/Kg wet	5.00		75.5	40-140			
Surrogate: 2-Bromonaphthalene	4.28		mg/Kg wet	5.00		85.7	40-140			
Surrogate: 2-Fluorobiphenyl	5.03		mg/Kg wet	5.00		101	40-140			
LCS (B187998-BS1)										
Prepared: 10/06/17 Analyzed: 10/09/17										
C9-C18 Aliphatics	22.5	10	mg/Kg wet	30.0		75.0	40-140			
C19-C36 Aliphatics	29.5	10	mg/Kg wet	40.0		73.7	40-140			
Acenaphthene	3.49	0.10	mg/Kg wet	5.00		69.9	40-140			
Acenaphthylene	3.40	0.10	mg/Kg wet	5.00		68.0	40-140			
Anthracene	3.29	0.10	mg/Kg wet	5.00		65.8	40-140			
Benzo(a)anthracene	3.38	0.10	mg/Kg wet	5.00		67.6	40-140			
Benzo(a)pyrene	3.42	0.10	mg/Kg wet	5.00		68.3	40-140			
Benzo(b)fluoranthene	3.46	0.10	mg/Kg wet	5.00		69.2	40-140			
Benzo(g,h,i)perylene	3.48	0.10	mg/Kg wet	5.00		69.6	40-140			
Benzo(k)fluoranthene	3.24	0.10	mg/Kg wet	5.00		64.8	40-140			
Chrysene	3.25	0.10	mg/Kg wet	5.00		65.1	40-140			
Dibenz(a,h)anthracene	3.66	0.10	mg/Kg wet	5.00		73.2	40-140			
Fluoranthene	3.28	0.10	mg/Kg wet	5.00		65.6	40-140			
Fluorene	3.40	0.10	mg/Kg wet	5.00		68.1	40-140			
Indeno(1,2,3-cd)pyrene	3.50	0.10	mg/Kg wet	5.00		70.1	40-140			
2-Methylnaphthalene	3.58	0.10	mg/Kg wet	5.00		71.6	40-140			
Naphthalene	3.18	0.10	mg/Kg wet	5.00		63.7	40-140			
Phenanthrene	3.35	0.10	mg/Kg wet	5.00		67.0	40-140			
Pyrene	3.33	0.10	mg/Kg wet	5.00		66.7	40-140			
n-Decane	2.69	0.10	mg/Kg wet	5.00		53.7	40-140			
n-Docosane	3.19	0.10	mg/Kg wet	5.00		63.9	40-140			
n-Dodecane	3.09	0.10	mg/Kg wet	5.00		61.8	40-140			
n-Eicosane	3.29	0.10	mg/Kg wet	5.00		65.7	40-140			
n-Hexacosane	3.19	0.10	mg/Kg wet	5.00		63.9	40-140			
n-Hexadecane	3.26	0.10	mg/Kg wet	5.00		65.3	40-140			
n-Hexatriacontane	3.52	0.10	mg/Kg wet	5.00		70.5	40-140			
n-Nonadecane	3.20	0.10	mg/Kg wet	5.00		63.9	40-140			
n-Nonane	2.11	0.10	mg/Kg wet	5.00		42.2	30-140			
n-Octacosane	3.18	0.10	mg/Kg wet	5.00		63.6	40-140			
n-Octadecane	3.32	0.10	mg/Kg wet	5.00		66.4	40-140			
n-Tetracosane	3.23	0.10	mg/Kg wet	5.00		64.5	40-140			
n-Tetradecane	3.21	0.10	mg/Kg wet	5.00		64.2	40-140			
n-Triacontane	3.28	0.10	mg/Kg wet	5.00		65.6	40-140			
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
Surrogate: Chlorooctadecane (COD)	3.19		mg/Kg wet	4.99		63.9	40-140			
Surrogate: o-Terphenyl (OTP)	3.68		mg/Kg wet	5.00		73.6	40-140			
Surrogate: 2-Bromonaphthalene	4.30		mg/Kg wet	5.00		85.9	40-140			
Surrogate: 2-Fluorobiphenyl	5.26		mg/Kg wet	5.00		105	40-140			

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QUALITY CONTROL

Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B187998 - SW-846 3546										
LCS Dup (B187998-BSD1)										
					Prepared: 10/06/17 Analyzed: 10/09/17					
C9-C18 Aliphatics	23.6	10	mg/Kg wet	30.0		78.7	40-140	4.84	25	
C19-C36 Aliphatics	33.6	10	mg/Kg wet	40.0		83.9	40-140	12.9	25	
Acenaphthene	3.96	0.10	mg/Kg wet	5.00		79.3	40-140	12.6	25	
Acenaphthylene	3.81	0.10	mg/Kg wet	5.00		76.1	40-140	11.3	25	
Anthracene	3.95	0.10	mg/Kg wet	5.00		79.0	40-140	18.1	25	
Benzo(a)anthracene	4.07	0.10	mg/Kg wet	5.00		81.3	40-140	18.4	25	
Benzo(a)pyrene	4.10	0.10	mg/Kg wet	5.00		82.0	40-140	18.1	25	
Benzo(b)fluoranthene	4.18	0.10	mg/Kg wet	5.00		83.5	40-140	18.8	25	
Benzo(g,h,i)perylene	4.11	0.10	mg/Kg wet	5.00		82.2	40-140	16.5	25	
Benzo(k)fluoranthene	3.87	0.10	mg/Kg wet	5.00		77.3	40-140	17.7	25	
Chrysene	3.88	0.10	mg/Kg wet	5.00		77.5	40-140	17.5	25	
Dibenz(a,h)anthracene	4.31	0.10	mg/Kg wet	5.00		86.2	40-140	16.4	25	
Fluoranthene	3.95	0.10	mg/Kg wet	5.00		79.0	40-140	18.5	25	
Fluorene	3.97	0.10	mg/Kg wet	5.00		79.4	40-140	15.4	25	
Indeno(1,2,3-cd)pyrene	4.22	0.10	mg/Kg wet	5.00		84.4	40-140	18.5	25	
2-Methylnaphthalene	3.88	0.10	mg/Kg wet	5.00		77.6	40-140	8.13	25	
Naphthalene	3.42	0.10	mg/Kg wet	5.00		68.4	40-140	7.08	25	
Phenanthrene	4.01	0.10	mg/Kg wet	5.00		80.1	40-140	17.9	25	
Pyrene	4.02	0.10	mg/Kg wet	5.00		80.4	40-140	18.6	25	
n-Decane	2.72	0.10	mg/Kg wet	5.00		54.4	40-140	1.27	25	
n-Docosane	3.64	0.10	mg/Kg wet	5.00		72.8	40-140	13.1	25	
n-Dodecane	3.17	0.10	mg/Kg wet	5.00		63.4	40-140	2.66	25	
n-Eicosane	3.74	0.10	mg/Kg wet	5.00		74.8	40-140	13.0	25	
n-Hexacosane	3.63	0.10	mg/Kg wet	5.00		72.7	40-140	12.8	25	
n-Hexadecane	3.71	0.10	mg/Kg wet	5.00		74.1	40-140	12.7	25	
n-Hexatriacontane	3.99	0.10	mg/Kg wet	5.00		79.7	40-140	12.3	25	
n-Nonadecane	3.65	0.10	mg/Kg wet	5.00		73.1	40-140	13.4	25	
n-Nonane	2.08	0.10	mg/Kg wet	5.00		41.6	30-140	1.53	25	
n-Octacosane	3.60	0.10	mg/Kg wet	5.00		72.1	40-140	12.5	25	
n-Octadecane	3.79	0.10	mg/Kg wet	5.00		75.8	40-140	13.2	25	
n-Tetracosane	3.68	0.10	mg/Kg wet	5.00		73.5	40-140	13.0	25	
n-Tetradecane	3.50	0.10	mg/Kg wet	5.00		69.9	40-140	8.63	25	
n-Triacontane	3.70	0.10	mg/Kg wet	5.00		74.0	40-140	12.1	25	
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
Surrogate: Chlorooctadecane (COD)	3.34		mg/Kg wet	4.99		67.0	40-140			
Surrogate: o-Terphenyl (OTP)	4.05		mg/Kg wet	5.00		81.1	40-140			
Surrogate: 2-Bromonaphthalene	4.76		mg/Kg wet	5.00		95.2	40-140			
Surrogate: 2-Fluorobiphenyl	5.61		mg/Kg wet	5.00		112	40-140			

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QUALITY CONTROL
Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B187639 - SW-846 3050B
Blank (B187639-BLK1)

Prepared: 10/03/17 Analyzed: 10/04/17

Antimony	ND	2.5	mg/Kg wet							
Arsenic	ND	2.5	mg/Kg wet							
Barium	ND	2.5	mg/Kg wet							
Beryllium	ND	0.25	mg/Kg wet							
Cadmium	ND	0.25	mg/Kg wet							
Chromium	ND	0.50	mg/Kg wet							
Lead	ND	0.75	mg/Kg wet							
Nickel	ND	0.50	mg/Kg wet							
Selenium	ND	5.0	mg/Kg wet							
Silver	ND	0.50	mg/Kg wet							
Thallium	ND	2.5	mg/Kg wet							
Vanadium	ND	1.0	mg/Kg wet							
Zinc	ND	1.0	mg/Kg wet							

LCS (B187639-BS1)

Prepared: 10/03/17 Analyzed: 10/04/17

Antimony	73.4	4.9	mg/Kg wet	146		50.3	0-210.3			
Arsenic	129	4.9	mg/Kg wet	157		82.0	77.8-122.1			
Barium	305	4.9	mg/Kg wet	339		90.0	82-117.4			
Beryllium	53.4	0.49	mg/Kg wet	58.3		91.7	82.3-117.7			
Cadmium	195	0.49	mg/Kg wet	216		90.2	81.9-118.2			
Chromium	77.1	0.98	mg/Kg wet	88.9		86.8	78.7-120.6			
Lead	80.3	1.5	mg/Kg wet	94.3		85.2	82.4-117.8			
Nickel	143	0.98	mg/Kg wet	154		92.9	82.2-117.8			
Selenium	175	9.8	mg/Kg wet	207		84.7	77.1-122.3			
Silver	36.2	0.98	mg/Kg wet	43.8		82.6	74.3-125.4			
Thallium	138	4.9	mg/Kg wet	167		82.8	78.2-121.6			
Vanadium	93.3	2.0	mg/Kg wet	100		93.3	64.8-135.2			
Zinc	198	2.0	mg/Kg wet	209		94.6	79.7-120.8			

LCS Dup (B187639-BSD1)

Prepared: 10/03/17 Analyzed: 10/04/17

Antimony	65.3	5.0	mg/Kg wet	146		44.7	0-210.3	11.7	30	
Arsenic	127	5.0	mg/Kg wet	157		80.9	77.8-122.1	1.35	30	
Barium	301	5.0	mg/Kg wet	339		88.8	82-117.4	1.42	30	
Beryllium	50.6	0.50	mg/Kg wet	58.3		86.8	82.3-117.7	5.48	30	
Cadmium	183	0.50	mg/Kg wet	216		84.9	81.9-118.2	6.03	30	
Chromium	75.2	1.0	mg/Kg wet	88.9		84.6	78.7-120.6	2.52	30	
Lead	78.9	1.5	mg/Kg wet	94.3		83.7	82.4-117.8	1.79	30	
Nickel	134	1.0	mg/Kg wet	154		87.2	82.2-117.8	6.34	30	
Selenium	169	10	mg/Kg wet	207		81.9	77.1-122.3	3.38	30	
Silver	34.6	1.0	mg/Kg wet	43.8		79.1	74.3-125.4	4.38	30	
Thallium	140	5.0	mg/Kg wet	167		83.7	78.2-121.6	0.990	30	
Vanadium	87.1	2.0	mg/Kg wet	100		87.1	64.8-135.2	6.88	30	
Zinc	188	2.0	mg/Kg wet	209		89.9	79.7-120.8	5.11	30	

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QUALITY CONTROL
Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B187639 - SW-846 3050B

Duplicate (B187639-DUP1)		Source: 17I1251-01		Prepared: 10/03/17 Analyzed: 10/04/17						
Antimony	ND	2.7	mg/Kg dry		ND			NC	35	
Arsenic	ND	2.7	mg/Kg dry		ND			NC	35	
Barium	120	2.7	mg/Kg dry		124			2.97	35	
Beryllium	ND	0.27	mg/Kg dry		ND			NC	35	
Cadmium	1.66	0.27	mg/Kg dry		1.06			44.2 *	35	R-02
Chromium	26.5	0.53	mg/Kg dry		23.1			13.5	35	
Lead	113	0.80	mg/Kg dry		124			10.0	35	
Nickel	15.5	0.53	mg/Kg dry		13.6			12.9	35	
Selenium	ND	5.3	mg/Kg dry		ND			NC	35	
Silver	ND	0.53	mg/Kg dry		ND			NC	35	
Thallium	ND	2.7	mg/Kg dry		ND			NC	35	
Vanadium	20.2	1.1	mg/Kg dry		17.9			11.7	35	
Zinc	911	1.1	mg/Kg dry		501			58.0 *	35	R-02

MRL Check (B187639-MRL1)

Prepared: 10/03/17 Analyzed: 10/05/17

Lead	0.762	0.72	mg/Kg wet	0.718	106	80-120				
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Matrix Spike (B187639-MS1)
Source: 17I1251-01

Prepared: 10/03/17 Analyzed: 10/04/17

Antimony	14.9	2.6	mg/Kg dry	26.4	2.59	46.7 *	75-125			MS-07
Arsenic	24.3	2.6	mg/Kg dry	26.4	ND	92.2	75-125			
Barium	118	2.6	mg/Kg dry	26.4	124	-21.7 *	75-125			MS-19
Beryllium	24.7	0.26	mg/Kg dry	26.4	ND	93.7	75-125			
Cadmium	25.6	0.26	mg/Kg dry	26.4	1.06	93.1	75-125			
Chromium	51.1	0.53	mg/Kg dry	26.4	23.1	106	75-125			
Lead	123	0.79	mg/Kg dry	26.4	124	-5.62 *	75-125			MS-19
Nickel	37.8	0.53	mg/Kg dry	26.4	13.6	91.7	75-125			
Selenium	23.0	5.3	mg/Kg dry	26.4	ND	87.1	75-125			
Silver	24.6	0.53	mg/Kg dry	26.4	ND	93.1	75-125			
Thallium	27.1	2.6	mg/Kg dry	26.4	ND	103	75-125			
Vanadium	47.2	1.1	mg/Kg dry	26.4	17.9	111	75-125			
Zinc	420	1.1	mg/Kg dry	26.4	501	-308 *	75-125			MS-19

Batch B187640 - SW-846 7471
Blank (B187640-BLK1)

Prepared: 10/03/17 Analyzed: 10/04/17

Mercury	ND	0.025	mg/Kg wet							
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LCS (B187640-BS1)

Prepared: 10/03/17 Analyzed: 10/04/17

Mercury	10.7	2.0	mg/Kg wet	9.36	114	73.7-126.3				
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LCS Dup (B187640-BSD1)

Prepared: 10/03/17 Analyzed: 10/04/17

Mercury	9.07	1.9	mg/Kg wet	9.36	97.0	73.7-126.3	16.0	30		
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QUALITY CONTROL
Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B187640 - SW-846 7471										
Duplicate (B187640-DUP1)	Source: 1711251-01				Prepared: 10/03/17 Analyzed: 10/04/17					
Mercury	0.291	0.027	mg/Kg dry		0.222			26.8	35	
Matrix Spike (B187640-MS1)	Source: 1711251-01				Prepared: 10/03/17 Analyzed: 10/04/17					
Mercury	0.354	0.027	mg/Kg dry	0.178	0.222	74.2	* 75-125			MS-07

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QUALITY CONTROL
Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B187377 - % Solids
Duplicate (B187377-DUP1)
Source: 1711251-01

Prepared: 09/29/17 Analyzed: 10/02/17

% Solids	89.8		% Wt		93.1			3.61	20	
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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit
DL	Method Detection Limit
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
DL-04	Elevated reporting limit due to high concentration of an interfering analyte(s).
L-07A	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD outside of control limits. Reduced precision anticipated for any reported result for this compound.
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possibility of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-19	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated.
R-02	Duplicate RPD is outside of control limits. Outlier can be attributed to sample non-homogeneity encountered during sample prep.
R-05	Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.
S-15	Surrogate recovery outside of control limits due to suspected sample matrix interference. Chromatogram(s) is attached.

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>MADEP-EPH-04-1.1 in Soil</i>	
C9-C18 Aliphatics	CT,NC,ME,NH-P
C19-C36 Aliphatics	CT,NC,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,ME,NH-P
C11-C22 Aromatics	CT,NC,ME,NH-P
Acenaphthene	CT,NC,ME,NH-P
Acenaphthylene	CT,NC,ME,NH-P
Anthracene	CT,NC,ME,NH-P
Benzo(a)anthracene	CT,NC,ME,NH-P
Benzo(a)pyrene	CT,NC,ME,NH-P
Benzo(b)fluoranthene	CT,NC,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,ME,NH-P
Benzo(k)fluoranthene	CT,NC,ME,NH-P
Chrysene	CT,NC,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,ME,NH-P
Fluoranthene	CT,NC,ME,NH-P
Fluorene	CT,NC,ME
Indeno(1,2,3-cd)pyrene	CT,NC,ME,NH-P
2-Methylnaphthalene	CT,NC
Naphthalene	CT,NC,ME,NH-P
Phenanthrene	CT,NC,ME,NH-P
Pyrene	CT,NC,ME,NH-P
<i>SW-846 6010C-D in Soil</i>	
Antimony	CT,NH,NY,ME,VA,NC
Arsenic	CT,NH,NY,ME,VA,NC
Barium	CT,NH,NY,ME,VA,NC
Beryllium	CT,NH,NY,ME,VA,NC
Cadmium	CT,NH,NY,ME,VA,NC
Chromium	CT,NH,NY,ME,VA,NC
Lead	CT,NH,NY,AIHA,ME,VA,NC
Nickel	CT,NH,NY,ME,VA,NC
Selenium	CT,NH,NY,ME,VA,NC
Silver	CT,NH,NY,ME,VA,NC
Thallium	CT,NH,NY,ME,VA,NC
Vanadium	CT,NH,NY,ME,VA,NC
Zinc	CT,NH,NY,ME,VA,NC
<i>SW-846 7471B in Soil</i>	
Mercury	CT,NH,NY,NC,ME,VA

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The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	02/1/2018
MA	Massachusetts DEP	M-MA100	06/30/2018
CT	Connecticut Department of Public Health	PH-0567	09/30/2019
NY	New York State Department of Health	10899 NELAP	04/1/2018
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2018
RI	Rhode Island Department of Health	LAO00112	12/30/2017
NC	North Carolina Div. of Water Quality	652	12/31/2017
NJ	New Jersey DEP	MA007 NELAP	06/30/2018
FL	Florida Department of Health	E871027 NELAP	06/30/2018
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2018
ME	State of Maine	2011028	06/9/2019
VA	Commonwealth of Virginia	460217	12/14/2017
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2018
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2018
NC-DW	North Carolina Department of Health	25703	07/31/2018

[illegible]

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
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www.contestlabs.com



con-test®
ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client OTT Engineering Inc

Received By RAP Date 9/27/17 Time 11:15

How were the samples received? In Cooler T No Cooler On Ice T No Ice
Direct from Sampling Ambient Melted Ice

Were samples within Temperature? 2-6°C T By Gun # 1 Actual Temp - 5.2° C
By Blank # Actual Temp -

Was Custody Seal Intact? N/A Were Samples Tampered with? F
Was COC Relinquished? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all pertinent Information? Client T Analysis T Sampler Name T
Project T ID's T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified?

Are there Rushes? F Who was notified?

Are there Short Holds? F Who was notified?

Is there enough Volume? T

Is there Headspace where applicable? F

Proper Media/Containers Used? T MS/MSD? F

Were trip blanks received? F Is splitting samples required? F

Do all samples have the proper pH? N/A On COC? F

Acid Base

Vials	#	Containers:	#	#	#	#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear
DI-		Other Plastic		Other Glass		Encore
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:
Sulfuric-		Perchlorate		Ziplock		

Unused Media

Vials	#	Containers:	#	#	#	#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear
DI-		Other Plastic		Other Glass		Encore
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:
Sulfuric-		Perchlorate		Ziplock		

Comments:

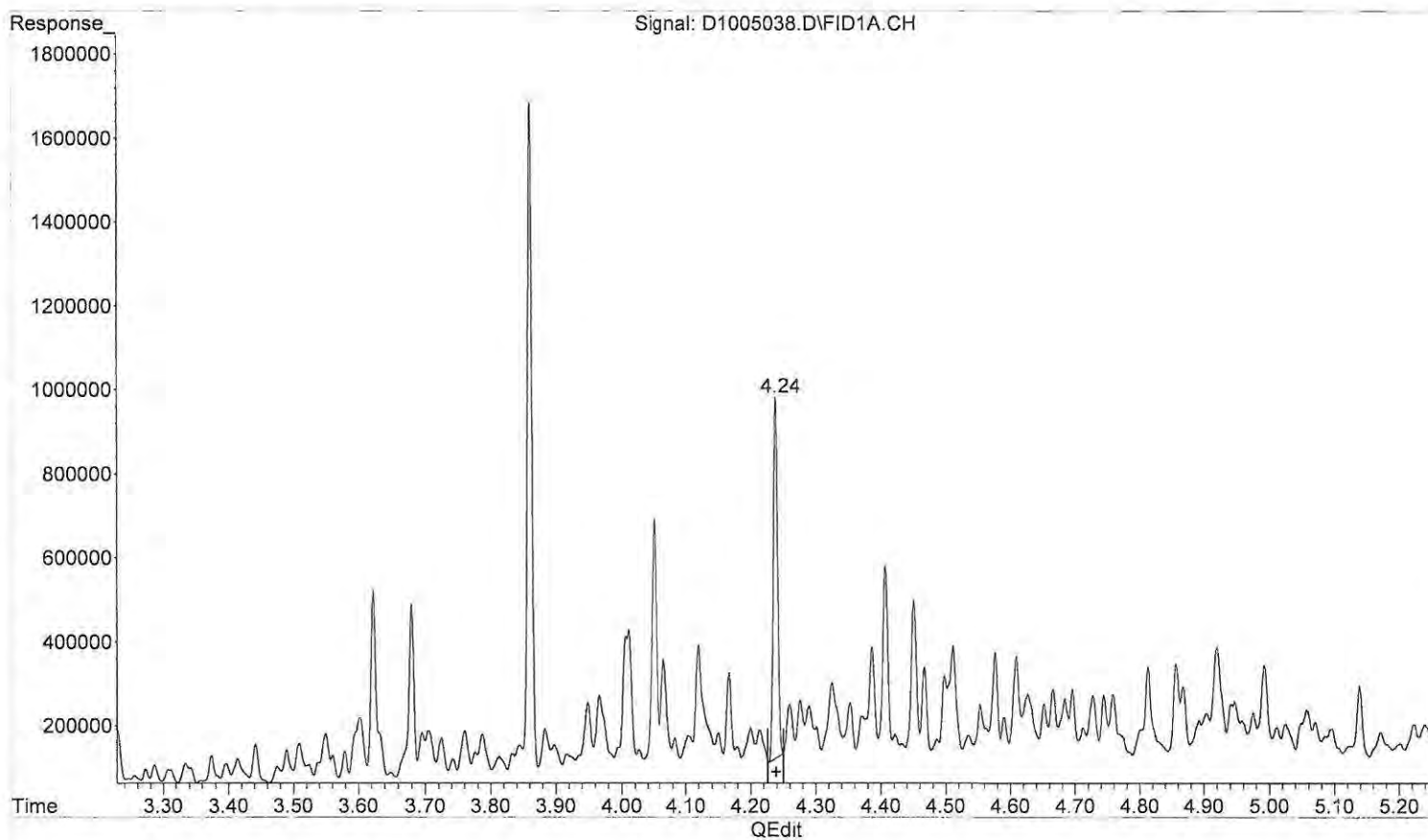
Quantitation Report (Qedit)

Data Path : C:\MSDCHEM\4\DATA\D100517\
Data File : D1005038.D
Signal(s) : FID1A.CH
Acq On : 05 Oct 2017 5:35 pm
Operator : CJM
Sample : 17I1251-08
Misc :
ALS Vial : 38 Sample Multiplier: 1

Inst : GCFID4

Integration File: AROM.E
Quant Time: Oct 06 11:32:19 2017
DataAcq Meth:EPH11D.M
Quant Method : C:\MSDCHEM\4\METHODS\AR101016M.M
Quant Title : MA EPH Aromatic GCFID4
QLast Update : Tue Sep 19 14:24:39 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1 uL
Signal Phase : Rtx-5Sil MS w/Integra-Guard
Signal Info : 0.25 mm



(5) 2-Bromonaphthalene (S)

4.24min 63.490ug/mL

response 4024939

Matrix Interference

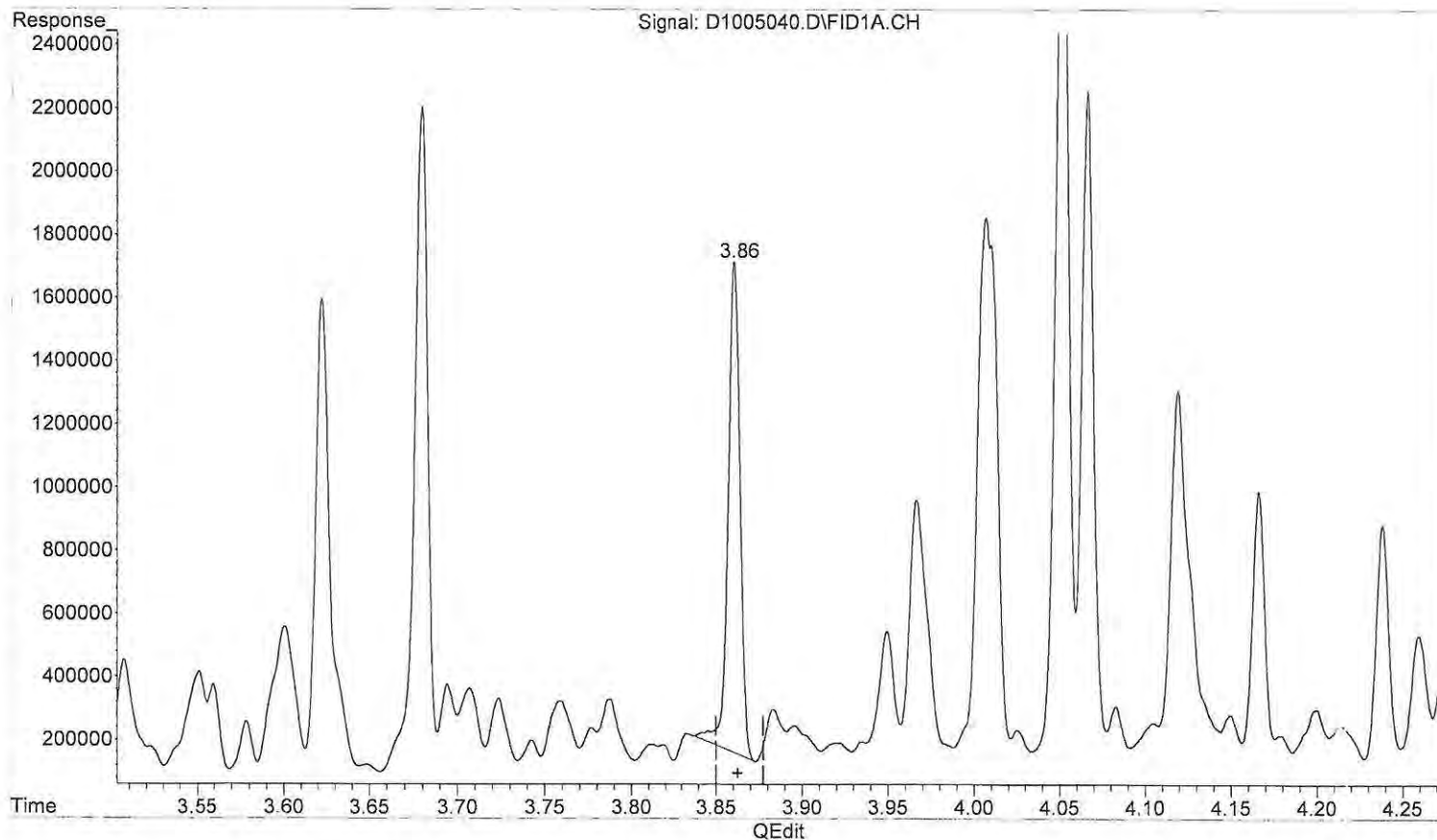
Quantitation Report (Qedit)

Data Path : C:\MSDCHEM\4\DATA\D100517\
Data File : D1005040.D
Signal(s) : FID1A.CH
Acq On : 05 Oct 2017 5:55 pm
Operator : CJM
Sample : 17I1251-09
Misc :
ALS Vial : 40 Sample Multiplier: 1

Inst : GCFID4

Integration File: AROM.E
Quant Time: Oct 06 10:59:41 2017
DataAcq Meth:EPH11D.M
Quant Method : C:\MSDCHEM\4\METHODS\AR101016M.M
Quant Title : MA EPH Aromatic GCFID4
QLast Update : Tue Sep 19 14:24:39 2017
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. : 1 uL
Signal Phase : Rtx-5Sil MS w/Integra-Guard
Signal Info : 0.25 mm



(3) 2-Fluorobiphenyl (S)

3.86min 83.834ug/mL

response 7507751

Matrix Interference

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory	Project #: 1711251				
Project Location: EEM-Chicopee	RTN:				
This Form provides certifications for the following data set: [list Laboratory Sample ID Number(s)] 1711251-01 thru 1711251-14					
Matrices: Soil					
CAM Protocol (check all that below)					
8260 VOC CAM II A ()	7470/7471 Hg CAM IIIB (X)	MassDEP VPH CAM IV A ()	8081 Pesticides CAM V B ()	7196 Hex Cr CAM VI B ()	MassDEP APH CAM IX A ()
8270 SVOC CAM II B ()	7010 Metals CAM III C ()	MassDEP EPH CAM IV A (X)	8151 Herbicides CAM V C ()	8330 Explosives CAM VIII A ()	TO-15 VOC CAM IX B ()
6010 Metals CAM III A (X)	6020 Metals CAM III D ()	8082 PCB CAM V A ()	9014 Total Cyanide/PAC CAM VI A ()	6860 Perchlorate CAM VIII B ()	
Affirmative response to Questions A through F is required for "Presumptive Certainty" status					
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?				☒ Yes ☐ No ¹
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?				☒ Yes ☐ No ¹
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?				☒ Yes ☐ No ¹
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?				☒ Yes ☐ No ¹
E a	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).				☒ Yes ☐ No ¹
E b	APH and TO-15 Methods only: Was the complete analyte list reported for each method?				☐ Yes ☐ No ¹
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all No responses to Questions A through E)?				☒ Yes ☐ No ¹
A response to questions G, H and I below is required for "Presumptive Certainty" status					
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?				☒ Yes ☐ No ¹
Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.					
H	Were all QC performance standards specified in the CAM protocol(s) achieved?				☐ Yes ☒ No ¹
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?				☒ Yes ☐ No ¹
¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.					
I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.					
Signature: 		Position: Laboratory Director			
Printed Name: Tod E. Kopyscinski		Date: 10/11/17			

QA/QC Worksheet for Laboratory Results

-- Data Usability & Presumptive Certainty Analysis --



110 Pulpit Hill Road
Amherst, MA 01002
(413) 835-0780 Phone
(413) 549-7918 Fax

Job No & Site Name: **15-1700**

Client: **Eastern Etching & Manufacturing**

Location: **35 Lower Grape Street, Chicopee, MA**

OHI Sampler(s): **WLW**

Sampling Date: **September 26, 2017**

Laboratory: **Con-Test Analytical Laboratory, Inc., E. Longmeadow, MA**

Lab Sample ID: **1711251**

Sample Matrix: **Soil**

Analytical methods performed:		<u>MADEP-EPH-04-1.1</u>	
		<u>14 MCP total metals</u>	
Sample(s)		Notes	
Was the sample collected in the appropriate container?	<u>Yes</u>		
Was the correct preservative used for the method?	<u>Yes</u>		
Chain of Custody (COC)			
Are the date(s) and sample time(s) recorded on the COC?	<u>Yes</u>		
Was a CAM report requested from the lab?	<u>Yes</u>		
Was the sample temperature recorded on the COC?	<u>Yes</u>		
Is the "chain" of signatures unbroken?	<u>Yes</u>		
Methods			
Are all methods acceptable by MA-DEP?	<u>Yes</u>		
Were all analytes reported for each method?	<u>Yes</u>		
Laboratory			
Were the sample(s) analyzed within the appropriate holding time?	<u>Yes</u>		
Are the surrogate recoveries within the CAM acceptable range(s)?	<u>No</u>	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD outside of control limits. Reduced precision anticipated for any reported result for this compound (n-Decane, n-Nonane).	
If surrogate recoveries were exceeded, was the batch accepted?	<u>No</u>	Surrogate recovery outside of control limits due to suspected sample matrix interference. Chromatogram(s) is attached for 2-Fluorobiphenyl in [B-11-11], [B-12-12].	
Were Reporting Limits elevated for any reason?	<u>Yes</u>	Elevated reporting limit due to high concentration of an interfering analyte(s) (Silver in B-10-7, B-9-12).	
For analytes not detected, are lab PQLs $\leq$ applicable standards?	<u>Yes</u>		
Are other issues raised in the Case Narrative?	<u>Yes</u>	Sample to spike ratio is greater than or equal to 4:1. Spiked amount is not representative of the native amount in the sample. Appropriate or meaningful recoveries cannot be calculated for Barium, Lead and Zinc in B-10-5'.	
QC Sample(s)			
Was a Field Duplicate submitted and analyzed?	<u>No</u>		
Was a matrix spike performed?	<u>Yes</u>		
Was a Trip Blank submitted and analyzed?	<u>No</u>		
MA-DEP Analytical Protocol Certification Form			
Were "Affirmative Responses" obtained for questions A - F?	<u>Yes</u>	Affirmative responses to questions A-F are required for "Presumptive Certainty" status.	
Were "responses" obtained for questions G, H, and I?	<u>Yes</u>	Responses to questions G, H, and I are required for "Presumptive Certainty" status.	
QA/QC Review			
Reviewed by: <u>Lyons Witten, PG, LSP</u>		Signature: <u>Lyons Witten</u>	
		Date: <u>10/18/2017</u>	

October 11, 2017

Lyons Witten
OHI Engineering, Inc. - Amherst
110 Pulpit Hill Road
Amherst, MA 01002

Project Location: Chicopee, MA
Client Job Number:
Project Number: 15-1679
Laboratory Work Order Number: 17J0115

Enclosed are results of analyses for samples received by the laboratory on October 3, 2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "James Georgantas". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

James M. Georgantas
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

OHI Engineering, Inc. - Amherst
110 Pulpit Hill Road
Amherst, MA 01002
ATTN: Lyons Witten

REPORT DATE: 10/11/2017

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 15-1679

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 17J0115

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Chicopee, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
MW-7	17J0115-01	Ground Water		SW-846 6020A-B SW-846 7470A	
MW-8	17J0115-02	Ground Water		MADEP-EPH-04-1.1 SW-846 6020A-B SW-846 7470A	
MW-9	17J0115-03	Ground Water		MADEP-EPH-04-1.1 SW-846 6020A-B SW-846 7470A	
MW-10	17J0115-04	Ground Water		MADEP-EPH-04-1.1 SW-846 6020A-B SW-846 7470A	
MW-11	17J0115-05	Ground Water		MADEP-EPH-04-1.1 SW-846 6020A-B SW-846 7470A	
MW-12	17J0115-06	Ground Water		MADEP-EPH-04-1.1 SW-846 6020A-B SW-846 7470A	
MW-13	17J0115-07	Ground Water		MADEP-EPH-04-1.1 SW-846 6020A-B SW-846 7470A	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SW-846 6020A-B

Qualifications:

B

Analyte is found in the associated blank as well as in the sample.

Analyte & Samples(s) Qualified:

Chromium

B187978-BS1, B187978-BSD1

B-05

Data is not affected by elevated level in blank since sample(s) result is "Not Detected".

Analyte & Samples(s) Qualified:

Chromium

17J0115-01[MW-7], 17J0115-02[MW-8], 17J0115-03[MW-9], 17J0115-04[MW-10], 17J0115-05[MW-11], 17J0115-06[MW-12], 17J0115-07[MW-13], B187978-BLK1

MADEP-EPH-04-1.1

SPE cartridge contamination with non-petroleum compounds, if present, is verified by GC/MS in each method blank per extraction batch and excluded from C11-C22 aromatic range fraction in all samples in the batch. No significant modifications were made to the method.

SW-846 6010C/D SW-846 6020A/B

For NC, Metals methods SW-846 6010D and SW-846 6020B are followed, and for all other states methods SW-846 6010C and SW-846 6020A are followed.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Tod E. Kopyscinski
Laboratory Director

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-7

Sampled: 10/3/2017 11:53

Sample ID: 17J0115-01

Sample Matrix: Ground Water

Metals Analyses (Dissolved)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH
Arsenic	ND	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH
Barium	47	10	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH
Beryllium	ND	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH
Cadmium	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH
Chromium	ND	1.0	µg/L	1	B-05	SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH
Lead	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH
Mercury	ND	0.00010	mg/L	1		SW-846 7470A	10/9/17	10/10/17 9:44	TJK
Nickel	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH
Selenium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH
Silver	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH
Thallium	ND	0.20	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH
Vanadium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH
Zinc	ND	10	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:24	MJH

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Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-8

Sampled: 10/3/2017 13:00

Sample ID: 17J0115-02

Sample Matrix: Ground Water

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
C19-C36 Aliphatics	ND	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Unadjusted C11-C22 Aromatics	ND	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
C11-C22 Aromatics	ND	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Acenaphthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Acenaphthylene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Benzo(a)anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Benzo(a)pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Benzo(b)fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Benzo(g,h,i)perylene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Benzo(k)fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Chrysene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Dibenz(a,h)anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Fluorene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Indeno(1,2,3-cd)pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
2-Methylnaphthalene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Naphthalene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Phenanthrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM
Pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:02	CJM

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	61.9	40-140	
o-Terphenyl (OTP)	84.1	40-140	
2-Bromonaphthalene	82.8	40-140	
2-Fluorobiphenyl	93.5	40-140	

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Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-8

Sampled: 10/3/2017 13:00

Sample ID: 17J0115-02

Sample Matrix: Ground Water

Metals Analyses (Dissolved)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH
Arsenic	ND	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH
Barium	78	10	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH
Beryllium	ND	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH
Cadmium	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH
Chromium	ND	1.0	µg/L	1	B-05	SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH
Lead	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH
Mercury	ND	0.00010	mg/L	1		SW-846 7470A	10/9/17	10/10/17 9:45	TJK
Nickel	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH
Selenium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH
Silver	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH
Thallium	ND	0.20	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH
Vanadium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH
Zinc	14	10	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:28	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-9

Sampled: 10/3/2017 14:00

Sample ID: 17J0115-03

Sample Matrix: Ground Water

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	100	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
C19-C36 Aliphatics	ND	100	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Unadjusted C11-C22 Aromatics	ND	100	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
C11-C22 Aromatics	ND	100	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Acenaphthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Acenaphthylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Benzo(a)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Benzo(a)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Benzo(b)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Benzo(g,h,i)perylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Benzo(k)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Chrysene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Dibenz(a,h)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Fluorene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
2-Methylnaphthalene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Naphthalene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Phenanthrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM
Pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:21	CJM

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	62.8	40-140	
o-Terphenyl (OTP)	89.2	40-140	
2-Bromonaphthalene	86.4	40-140	
2-Fluorobiphenyl	96.7	40-140	

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Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-9

Sampled: 10/3/2017 14:00

Sample ID: 17J0115-03

Sample Matrix: Ground Water

Metals Analyses (Dissolved)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH
Arsenic	ND	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH
Barium	75	10	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH
Beryllium	ND	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH
Cadmium	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH
Chromium	ND	1.0	µg/L	1	B-05	SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH
Lead	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH
Mercury	ND	0.00010	mg/L	1		SW-846 7470A	10/9/17	10/10/17 9:47	TJK
Nickel	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH
Selenium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH
Silver	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH
Thallium	ND	0.20	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH
Vanadium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH
Zinc	ND	10	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:38	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-10

Sampled: 10/3/2017 14:40

Sample ID: 17J0115-04

Sample Matrix: Ground Water

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	1000	100	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
C19-C36 Aliphatics	250	100	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Unadjusted C11-C22 Aromatics	750	100	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
C11-C22 Aromatics	720	100	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Acenaphthene	3.1	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Acenaphthylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Benzo(a)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Benzo(a)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Benzo(b)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Benzo(g,h,i)perylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Benzo(k)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Chrysene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Dibenz(a,h)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Fluorene	4.7	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
2-Methylnaphthalene	12	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Naphthalene	15	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Phenanthrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:40	CJM
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	62.5	40-140							
o-Terphenyl (OTP)	81.2	40-140							
2-Bromonaphthalene	81.7	40-140							
2-Fluorobiphenyl	92.9	40-140							

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Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-10

Sampled: 10/3/2017 14:40

Sample ID: 17J0115-04

Sample Matrix: Ground Water

Metals Analyses (Dissolved)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:41	MJH
Arsenic	1.1	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:41	MJH
Barium	180	50	µg/L	5		SW-846 6020A-B	10/6/17	10/10/17 3:23	MJH
Beryllium	ND	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:41	MJH
Cadmium	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:41	MJH
Chromium	ND	1.0	µg/L	1	B-05	SW-846 6020A-B	10/6/17	10/9/17 7:41	MJH
Lead	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:41	MJH
Mercury	ND	0.00010	mg/L	1		SW-846 7470A	10/9/17	10/10/17 9:48	TJK
Nickel	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:41	MJH
Selenium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:41	MJH
Silver	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:41	MJH
Thallium	ND	0.20	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:41	MJH
Vanadium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:41	MJH
Zinc	ND	10	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:41	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-11

Sampled: 10/3/2017 16:30

Sample ID: 17J0115-05

Sample Matrix: Ground Water

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	160	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
C19-C36 Aliphatics	140	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Unadjusted C11-C22 Aromatics	220	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
C11-C22 Aromatics	210	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Acenaphthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Acenaphthylene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Benzo(a)anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Benzo(a)pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Benzo(b)fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Benzo(g,h,i)perylene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Benzo(k)fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Chrysene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Dibenz(a,h)anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Fluorene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Indeno(1,2,3-cd)pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
2-Methylnaphthalene	4.9	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Naphthalene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Phenanthrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 20:59	CJM
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	63.7	40-140							
o-Terphenyl (OTP)	81.1	40-140							
2-Bromonaphthalene	80.4	40-140							
2-Fluorobiphenyl	94.5	40-140							

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Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-11

Sampled: 10/3/2017 16:30

Sample ID: 17J0115-05

Sample Matrix: Ground Water

Metals Analyses (Dissolved)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:45	MJH
Arsenic	ND	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:45	MJH
Barium	280	50	µg/L	5		SW-846 6020A-B	10/6/17	10/10/17 3:27	MJH
Beryllium	ND	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:45	MJH
Cadmium	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:45	MJH
Chromium	ND	1.0	µg/L	1	B-05	SW-846 6020A-B	10/6/17	10/9/17 7:45	MJH
Lead	6.6	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:45	MJH
Mercury	ND	0.00010	mg/L	1		SW-846 7470A	10/9/17	10/10/17 9:54	TJK
Nickel	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:45	MJH
Selenium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:45	MJH
Silver	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:45	MJH
Thallium	ND	0.20	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:45	MJH
Vanadium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:45	MJH
Zinc	50	10	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:45	MJH

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Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-12

Sampled: 10/3/2017 15:10

Sample ID: 17J0115-06

Sample Matrix: Ground Water

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	3800	480	µg/L	5		MADEP-EPH-04-1.1	10/9/17	10/11/17 11:04	CJM
C19-C36 Aliphatics	700	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Unadjusted C11-C22 Aromatics	1600	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
C11-C22 Aromatics	1600	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Acenaphthene	2.4	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Acenaphthylene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Benzo(a)anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Benzo(a)pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Benzo(b)fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Benzo(g,h,i)perylene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Benzo(k)fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Chrysene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Dibenz(a,h)anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Fluorene	3.7	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Indeno(1,2,3-cd)pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
2-Methylnaphthalene	4.2	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Naphthalene	3.4	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Phenanthrene	3.0	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:18	CJM
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	60.5	40-140							
o-Terphenyl (OTP)	88.0	40-140							
2-Bromonaphthalene	86.6	40-140							
2-Fluorobiphenyl	92.9	40-140							

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Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-12

Sampled: 10/3/2017 15:10

Sample ID: 17J0115-06

Sample Matrix: Ground Water

Metals Analyses (Dissolved)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:48	MJH
Arsenic	0.59	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:48	MJH
Barium	220	50	µg/L	5		SW-846 6020A-B	10/6/17	10/10/17 3:30	MJH
Beryllium	ND	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:48	MJH
Cadmium	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:48	MJH
Chromium	ND	1.0	µg/L	1	B-05	SW-846 6020A-B	10/6/17	10/9/17 7:48	MJH
Lead	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:48	MJH
Mercury	ND	0.00010	mg/L	1		SW-846 7470A	10/9/17	10/10/17 9:56	TJK
Nickel	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:48	MJH
Selenium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:48	MJH
Silver	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:48	MJH
Thallium	ND	0.20	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:48	MJH
Vanadium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:48	MJH
Zinc	ND	10	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:48	MJH

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Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-13

Sampled: 10/3/2017 14:05

Sample ID: 17J0115-07

Sample Matrix: Ground Water

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	5600	480	µg/L	5		MADEP-EPH-04-1.1	10/9/17	10/11/17 11:23	CJM
C19-C36 Aliphatics	1000	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Unadjusted C11-C22 Aromatics	1900	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
C11-C22 Aromatics	1900	97	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Acenaphthene	4.8	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Acenaphthylene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Benzo(a)anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Benzo(a)pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Benzo(b)fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Benzo(g,h,i)perylene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Benzo(k)fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Chrysene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Dibenz(a,h)anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Fluorene	8.9	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Indeno(1,2,3-cd)pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
2-Methylnaphthalene	8.4	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Naphthalene	6.6	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Phenanthrene	3.0	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	10/9/17	10/10/17 21:37	CJM
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	61.9	40-140							
o-Terphenyl (OTP)	83.6	40-140							
2-Bromonaphthalene	64.9	40-140							
2-Fluorobiphenyl	83.4	40-140							

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Project Location: Chicopee, MA

Sample Description:

Work Order: 17J0115

Date Received: 10/3/2017

Field Sample #: MW-13

Sampled: 10/3/2017 14:05

Sample ID: 17J0115-07

Sample Matrix: Ground Water

Metals Analyses (Dissolved)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Antimony	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:51	MJH
Arsenic	ND	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:51	MJH
Barium	110	50	µg/L	5		SW-846 6020A-B	10/6/17	10/10/17 3:33	MJH
Beryllium	ND	0.40	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:51	MJH
Cadmium	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:51	MJH
Chromium	ND	1.0	µg/L	1	B-05	SW-846 6020A-B	10/6/17	10/9/17 7:51	MJH
Lead	ND	1.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:51	MJH
Mercury	ND	0.00010	mg/L	1		SW-846 7470A	10/9/17	10/10/17 9:58	TJK
Nickel	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:51	MJH
Selenium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:51	MJH
Silver	ND	0.50	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:51	MJH
Thallium	ND	0.20	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:51	MJH
Vanadium	ND	5.0	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:51	MJH
Zinc	ND	10	µg/L	1		SW-846 6020A-B	10/6/17	10/9/17 7:51	MJH

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Sample Extraction Data**Prep Method: SW-846 3510C-MADEP-EPH-04-1.1**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17J0115-02 [MW-8]	B188150	980	1.90	10/09/17
17J0115-03 [MW-9]	B188150	950	1.90	10/09/17
17J0115-04 [MW-10]	B188150	950	1.90	10/09/17
17J0115-05 [MW-11]	B188150	980	1.90	10/09/17
17J0115-06 [MW-12]	B188150	980	1.90	10/09/17
17J0115-07 [MW-13]	B188150	980	1.90	10/09/17

Prep Method: SW-846 3005A Dissolved-SW-846 6020A-B

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17J0115-01 [MW-7]	B187978	50.0	50.0	10/06/17
17J0115-02 [MW-8]	B187978	50.0	50.0	10/06/17
17J0115-03 [MW-9]	B187978	50.0	50.0	10/06/17
17J0115-04 [MW-10]	B187978	50.0	50.0	10/06/17
17J0115-05 [MW-11]	B187978	50.0	50.0	10/06/17
17J0115-06 [MW-12]	B187978	50.0	50.0	10/06/17
17J0115-07 [MW-13]	B187978	50.0	50.0	10/06/17

Prep Method: SW-846 7470A Prep-SW-846 7470A

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17J0115-01 [MW-7]	B188144	6.00	6.00	10/09/17
17J0115-02 [MW-8]	B188144	6.00	6.00	10/09/17
17J0115-03 [MW-9]	B188144	6.00	6.00	10/09/17
17J0115-04 [MW-10]	B188144	6.00	6.00	10/09/17
17J0115-05 [MW-11]	B188144	6.00	6.00	10/09/17
17J0115-06 [MW-12]	B188144	6.00	6.00	10/09/17
17J0115-07 [MW-13]	B188144	6.00	6.00	10/09/17

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QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B188150 - SW-846 3510C
Blank (B188150-BLK1)

Prepared: 10/09/17 Analyzed: 10/10/17

C9-C18 Aliphatics	ND	100	µg/L							
C19-C36 Aliphatics	ND	100	µg/L							
Unadjusted C11-C22 Aromatics	ND	100	µg/L							
C11-C22 Aromatics	ND	100	µg/L							
Acenaphthene	ND	2.0	µg/L							
Acenaphthylene	ND	2.0	µg/L							
Anthracene	ND	2.0	µg/L							
Benzo(a)anthracene	ND	2.0	µg/L							
Benzo(a)pyrene	ND	2.0	µg/L							
Benzo(b)fluoranthene	ND	2.0	µg/L							
Benzo(g,h,i)perylene	ND	2.0	µg/L							
Benzo(k)fluoranthene	ND	2.0	µg/L							
Chrysene	ND	2.0	µg/L							
Dibenz(a,h)anthracene	ND	2.0	µg/L							
Fluoranthene	ND	2.0	µg/L							
Fluorene	ND	2.0	µg/L							
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L							
2-Methylnaphthalene	ND	2.0	µg/L							
Naphthalene	ND	2.0	µg/L							
Phenanthrene	ND	2.0	µg/L							
Pyrene	ND	2.0	µg/L							
n-Decane	ND	2.0	µg/L							
n-Docosane	ND	2.0	µg/L							
n-Dodecane	ND	2.0	µg/L							
n-Eicosane	ND	2.0	µg/L							
n-Hexacosane	ND	2.0	µg/L							
n-Hexadecane	ND	2.0	µg/L							
n-Hexatriacontane	ND	2.0	µg/L							
n-Nonadecane	ND	2.0	µg/L							
n-Nonane	ND	2.0	µg/L							
n-Octacosane	ND	2.0	µg/L							
n-Octadecane	ND	2.0	µg/L							
n-Tetracosane	ND	2.0	µg/L							
n-Tetradecane	ND	2.0	µg/L							
n-Triacontane	ND	2.0	µg/L							
Naphthalene-aliphatic fraction	ND	2.0	µg/L							
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L							
Surrogate: Chlorooctadecane (COD)	62.7		µg/L	99.8		62.8	40-140			
Surrogate: o-Terphenyl (OTP)	83.2		µg/L	100		83.2	40-140			
Surrogate: 2-Bromonaphthalene	83.7		µg/L	100		83.7	40-140			
Surrogate: 2-Fluorobiphenyl	91.2		µg/L	100		91.2	40-140			

LCS (B188150-BS1)

Prepared: 10/09/17 Analyzed: 10/10/17

C9-C18 Aliphatics	434	100	µg/L	600		72.4	0-200			
C19-C36 Aliphatics	712	100	µg/L	800		89.0	0-200			
Acenaphthene	76.5	2.0	µg/L	100		76.5	40-140			
Acenaphthylene	72.2	2.0	µg/L	100		72.2	40-140			
Anthracene	79.2	2.0	µg/L	100		79.2	40-140			
Benzo(a)anthracene	81.0	2.0	µg/L	100		81.0	40-140			
Benzo(a)pyrene	79.8	2.0	µg/L	100		79.8	40-140			
Benzo(b)fluoranthene	82.6	2.0	µg/L	100		82.6	40-140			
Benzo(g,h,i)perylene	81.4	2.0	µg/L	100		81.4	40-140			

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QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B188150 - SW-846 3510C
LCS (B188150-BS1)

Prepared: 10/09/17 Analyzed: 10/10/17

Benzo(k)fluoranthene	76.1	2.0	µg/L	100		76.1	40-140			
Chrysene	77.2	2.0	µg/L	100		77.2	40-140			
Dibenz(a,h)anthracene	84.5	2.0	µg/L	100		84.5	40-140			
Fluoranthene	79.8	2.0	µg/L	100		79.8	40-140			
Fluorene	79.5	2.0	µg/L	100		79.5	40-140			
Indeno(1,2,3-cd)pyrene	80.6	2.0	µg/L	100		80.6	40-140			
2-Methylnaphthalene	71.4	2.0	µg/L	100		71.4	40-140			
Naphthalene	62.1	2.0	µg/L	100		62.1	40-140			
Phenanthrene	81.6	2.0	µg/L	100		81.6	40-140			
Pyrene	80.9	2.0	µg/L	100		80.9	40-140			
n-Decane	48.1	2.0	µg/L	100		48.1	40-140			
n-Docosane	68.9	2.0	µg/L	100		68.9	40-140			
n-Dodecane	58.1	2.0	µg/L	100		58.1	40-140			
n-Eicosane	71.4	2.0	µg/L	100		71.4	40-140			
n-Hexacosane	68.5	2.0	µg/L	100		68.5	40-140			
n-Hexadecane	72.6	2.0	µg/L	100		72.6	40-140			
n-Hexatriacontane	84.9	2.0	µg/L	100		84.9	40-140			
n-Nonadecane	70.9	2.0	µg/L	100		70.9	40-140			
n-Nonane	37.9	2.0	µg/L	100		37.9	30-140			
n-Octacosane	69.4	2.0	µg/L	100		69.4	40-140			
n-Octadecane	74.0	2.0	µg/L	100		74.0	40-140			
n-Tetracosane	68.9	2.0	µg/L	100		68.9	40-140			
n-Tetradecane	68.4	2.0	µg/L	100		68.4	40-140			
n-Triacontane	73.6	2.0	µg/L	100		73.6	40-140			
Naphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
Surrogate: Chlorooctadecane (COD)	60.5		µg/L	99.8		60.6	40-140			
Surrogate: o-Terphenyl (OTP)	82.8		µg/L	100		82.8	40-140			
Surrogate: 2-Bromonaphthalene	84.1		µg/L	100		84.1	40-140			
Surrogate: 2-Fluorobiphenyl	90.5		µg/L	100		90.5	40-140			

LCS Dup (B188150-BS1)

Prepared: 10/09/17 Analyzed: 10/10/17

C9-C18 Aliphatics	455	100	µg/L	600		75.9	0-200	4.70		
C19-C36 Aliphatics	735	100	µg/L	800		91.9	0-200	3.16		
Acenaphthene	78.1	2.0	µg/L	100		78.1	40-140	1.97	25	
Acenaphthylene	74.0	2.0	µg/L	100		74.0	40-140	2.42	25	
Anthracene	82.1	2.0	µg/L	100		82.1	40-140	3.56	25	
Benzo(a)anthracene	84.6	2.0	µg/L	100		84.6	40-140	4.28	25	
Benzo(a)pyrene	83.3	2.0	µg/L	100		83.3	40-140	4.29	25	
Benzo(b)fluoranthene	86.1	2.0	µg/L	100		86.1	40-140	4.14	25	
Benzo(g,h,i)perylene	83.3	2.0	µg/L	100		83.3	40-140	2.26	25	
Benzo(k)fluoranthene	79.5	2.0	µg/L	100		79.5	40-140	4.32	25	
Chrysene	80.5	2.0	µg/L	100		80.5	40-140	4.07	25	
Dibenz(a,h)anthracene	84.9	2.0	µg/L	100		84.9	40-140	0.515	25	
Fluoranthene	82.9	2.0	µg/L	100		82.9	40-140	3.87	25	
Fluorene	81.8	2.0	µg/L	100		81.8	40-140	2.94	25	
Indeno(1,2,3-cd)pyrene	84.0	2.0	µg/L	100		84.0	40-140	4.19	25	
2-Methylnaphthalene	74.8	2.0	µg/L	100		74.8	40-140	4.59	25	
Naphthalene	66.1	2.0	µg/L	100		66.1	40-140	6.29	25	
Phenanthrene	85.0	2.0	µg/L	100		85.0	40-140	4.11	25	
Pyrene	84.0	2.0	µg/L	100		84.0	40-140	3.78	25	
n-Decane	52.3	2.0	µg/L	100		52.3	40-140	8.31	25	

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QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B188150 - SW-846 3510C
LCS Dup (B188150-BSD1)

Prepared: 10/09/17 Analyzed: 10/10/17

n-Docosane	74.3	2.0	µg/L	100		74.3	40-140	7.65	25	
n-Dodecane	60.1	2.0	µg/L	100		60.1	40-140	3.38	25	
n-Eicosane	77.1	2.0	µg/L	100		77.1	40-140	7.63	25	
n-Hexacosane	73.9	2.0	µg/L	100		73.9	40-140	7.55	25	
n-Hexadecane	76.5	2.0	µg/L	100		76.5	40-140	5.13	25	
n-Hexatriacontane	91.0	2.0	µg/L	100		91.0	40-140	6.94	25	
n-Nonadecane	76.2	2.0	µg/L	100		76.2	40-140	7.14	25	
n-Nonane	42.1	2.0	µg/L	100		42.1	30-140	10.3	25	
n-Octacosane	74.7	2.0	µg/L	100		74.7	40-140	7.33	25	
n-Octadecane	79.2	2.0	µg/L	100		79.2	40-140	6.80	25	
n-Tetracosane	74.3	2.0	µg/L	100		74.3	40-140	7.57	25	
n-Tetradecane	69.8	2.0	µg/L	100		69.8	40-140	1.99	25	
n-Triacontane	78.8	2.0	µg/L	100		78.8	40-140	6.87	25	
Naphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
Surrogate: Chlorooctadecane (COD)	62.3		µg/L	99.8		62.4	40-140			
Surrogate: o-Terphenyl (OTP)	84.0		µg/L	100		84.0	40-140			
Surrogate: 2-Bromonaphthalene	85.8		µg/L	100		85.8	40-140			
Surrogate: 2-Fluorobiphenyl	91.7		µg/L	100		91.7	40-140			

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QUALITY CONTROL
Metals Analyses (Dissolved) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B187978 - SW-846 3005A Dissolved
Blank (B187978-BLK1)

Prepared: 10/06/17 Analyzed: 10/09/17

Antimony	ND	1.0	µg/L							
Arsenic	ND	0.40	µg/L							
Barium	ND	10	µg/L							
Beryllium	ND	0.40	µg/L							
Cadmium	ND	0.50	µg/L							
Chromium	1.0	1.0	µg/L							B-05
Lead	ND	1.0	µg/L							
Nickel	ND	5.0	µg/L							
Selenium	ND	5.0	µg/L							
Silver	ND	0.50	µg/L							
Thallium	ND	0.20	µg/L							
Vanadium	ND	5.0	µg/L							
Zinc	ND	10	µg/L							

LCS (B187978-BS1)

Prepared: 10/06/17 Analyzed: 10/09/17

Antimony	501	10	µg/L	500		100	80-120			
Arsenic	504	4.0	µg/L	500		101	80-120			
Barium	494	100	µg/L	500		98.8	80-120			
Beryllium	504	4.0	µg/L	500		101	80-120			
Cadmium	495	5.0	µg/L	500		99.1	80-120			
Chromium	483	10	µg/L	500		96.5	80-120			B
Lead	498	10	µg/L	500		99.6	80-120			
Nickel	484	50	µg/L	500		96.7	80-120			
Selenium	514	50	µg/L	500		103	80-120			
Silver	470	5.0	µg/L	500		93.9	80-120			
Thallium	478	2.0	µg/L	500		95.6	80-120			
Vanadium	487	50	µg/L	500		97.4	80-120			
Zinc	1040	100	µg/L	1000		104	80-120			

LCS Dup (B187978-BSD1)

Prepared: 10/06/17 Analyzed: 10/09/17

Antimony	511	10	µg/L	500		102	80-120	1.84	20	
Arsenic	517	4.0	µg/L	500		103	80-120	2.44	20	
Barium	504	100	µg/L	500		101	80-120	1.88	20	
Beryllium	508	4.0	µg/L	500		102	80-120	0.819	20	
Cadmium	509	5.0	µg/L	500		102	80-120	2.76	20	
Chromium	496	10	µg/L	500		99.2	80-120	2.71	20	B
Lead	513	10	µg/L	500		103	80-120	2.89	20	
Nickel	497	50	µg/L	500		99.4	80-120	2.79	20	
Selenium	525	50	µg/L	500		105	80-120	2.11	20	
Silver	480	5.0	µg/L	500		96.0	80-120	2.15	20	
Thallium	493	2.0	µg/L	500		98.5	80-120	2.98	20	
Vanadium	501	50	µg/L	500		100	80-120	2.88	20	
Zinc	1070	100	µg/L	1000		107	80-120	2.97	20	

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QUALITY CONTROL
Metals Analyses (Dissolved) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B188144 - SW-846 7470A Prep
Blank (B188144-BLK1)

Prepared: 10/09/17 Analyzed: 10/10/17

Mercury	ND	0.00010	mg/L							
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LCS (B188144-BS1)

Prepared: 10/09/17 Analyzed: 10/10/17

Mercury	0.00178	0.00010	mg/L	0.00200		89.0	80-120			
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LCS Dup (B188144-BSD1)

Prepared: 10/09/17 Analyzed: 10/10/17

Mercury	0.00169	0.00010	mg/L	0.00200		84.5	80-120	5.27	20	
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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit
DL	Method Detection Limit
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
B	Analyte is found in the associated blank as well as in the sample.
B-05	Data is not affected by elevated level in blank since sample(s) result is "Not Detected".

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>MADEP-EPH-04-1.1 in Water</i>	
C9-C18 Aliphatics	CT,NC,ME,NH-P
C19-C36 Aliphatics	CT,NC,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,ME,NH-P
C11-C22 Aromatics	CT,NC,ME,NH-P
Acenaphthene	CT,NC,ME,NH-P
Acenaphthylene	CT,NC,ME,NH-P
Anthracene	CT,NC,ME,NH-P
Benzo(a)anthracene	CT,NC,ME,NH-P
Benzo(a)pyrene	CT,NC,ME,NH-P
Benzo(b)fluoranthene	CT,NC,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,ME,NH-P
Benzo(k)fluoranthene	CT,NC,ME,NH-P
Chrysene	CT,NC,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,ME,NH-P
Fluoranthene	CT,NC,ME,NH-P
Fluorene	CT,NC,ME
Indeno(1,2,3-cd)pyrene	CT,NC,ME,NH-P
2-Methylnaphthalene	CT,NC
Naphthalene	CT,NC,ME,NH-P
Phenanthrene	CT,NC,ME,NH-P
Pyrene	CT,NC,ME,NH-P
<i>SW-846 6020A-B in Water</i>	
Antimony	CT,NH,NY,ME,VA,NC
Arsenic	CT,NH,NY,NC,ME,VA
Barium	MA,NY,CT,NC,NH,ME,VA
Beryllium	CT,NH,NY,NC,ME,VA
Cadmium	CT,NH,NY,NC,ME,VA
Chromium	CT,NH,NY,NC,ME,VA
Lead	CT,NH,NY,NC,ME,VA
Nickel	CT,NH,NY,NC,ME,VA
Selenium	CT,NH,NY,NC,ME,VA
Silver	CT,NC,NH,NY,ME,VA
Thallium	CT,NH,NY,NC,ME,VA
Vanadium	CT,NH,NY,NC,ME,VA
Zinc	CT,NH,NY,NC,ME,VA
<i>SW-846 7470A in Water</i>	
Mercury	CT,NH,NY,NC,ME,VA

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The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	02/1/2018
MA	Massachusetts DEP	M-MA100	06/30/2018
CT	Connecticut Department of Public Health	PH-0567	09/30/2019
NY	New York State Department of Health	10899 NELAP	04/1/2018
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2018
RI	Rhode Island Department of Health	LAO00112	12/30/2017
NC	North Carolina Div. of Water Quality	652	12/31/2017
NJ	New Jersey DEP	MA007 NELAP	06/30/2018
FL	Florida Department of Health	E871027 NELAP	06/30/2018
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2018
ME	State of Maine	2011028	06/9/2019
VA	Commonwealth of Virginia	460217	12/14/2017
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2018
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2018
NC-DW	North Carolina Department of Health	25703	07/31/2018

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.contestlabs.com



con-test®
ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client OHI Eng.
Received By JM Date 10/3/17 Time 1725

How were the samples received? In Cooler T No Cooler On Ice No Ice T
Direct from Sampling T Ambient Melted Ice

Were samples within Temperature? 2-6°C F By Gun # 1 Actual Temp - 20.3
By Blank # Actual Temp -

Was Custody Seal Intact? N/A Were Samples Tampered with? N/A
Was COC Relinquished? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T
Did COC include all Client T Analysis T Sampler Name T
pertinent Information? Project T ID's T Collection Dates/Times T

Are Sample labels filled out and legible? T
Are there Lab to Filters? T Who was notified? Emily
Are there Rushes? N/A Who was notified?
Are there Short Holds? N/A Who was notified?

Is there enough Volume? T
Is there Headspace where applicable? N/A MS/MSD? N/A
Proper Media/Containers Used? T Is splitting samples required? N/A
Were trip blanks received? N/A On COC? N/A
Do all samples have the proper pH? Acid T Base

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.	<u>12</u>	1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic	<u>7</u>	4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory	Project #: 17J0115
Project Location: Chicopee, MA	RTN:

This Form provides certifications for the following data set: [list Laboratory Sample ID Number(s)]
17J0115-01 thru 17J0115-07

Matrices: Water

CAM Protocol (check all that below)

8260 VOC CAM II A ()	7470/7471 Hg CAM IIIB (X)	MassDEP VPH CAM IV A ()	8081 Pesticides CAM V B ()	7196 Hex Cr CAM VI B ()	MassDEP APH CAM IX A ()
8270 SVOC CAM II B ()	7010 Metals CAM III C ()	MassDEP EPH CAM IV A (X)	8151 Herbicides CAM V C ()	8330 Explosives CAM VIII A ()	TO-15 VOC CAM IX B ()
6010 Metals CAM III A ()	6020 Metals CAM III D (X)	8082 PCB CAM V A ()	9014 Total Cyanide/PAC CAM VI A ()	6860 Perchlorate CAM VIII B ()	

Affirmative response to Questions A through F is required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No ¹
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No ¹
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☒ Yes ☐ No ¹
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?	☒ Yes ☐ No ¹
E a	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	☒ Yes ☐ No ¹
E b	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ¹
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all No responses to Questions A through E)?	☒ Yes ☐ No ¹

A response to questions G, H and I below is required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☒ Yes ☐ No ¹
----------	---	--

Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.

H	Were all QC performance standards specified in the CAM protocol(s) achieved?	☐ Yes ☒ No ¹
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☒ Yes ☐ No ¹

¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: <u>Tod Kopyscinski</u>	Position: Laboratory Director
Printed Name: <u>Tod E. Kopyscinski</u>	Date: <u>10/11/17</u>

QA/QC Worksheet for Laboratory Results

-- Data Usability & Presumptive Certainty Analysis --



110 Pulpit Hill Road
Amherst, MA 01002
(413) 835-0780 Phone
(413) 549-7918 Fax

Job No & Site Name: 15-1700

Client: Eastern Etching & Manufacturing

Location: 35 Lower Grape Street, Chicopee, MA

OHI Sampler(s): WLW

Sampling Date: October 3, 2017

Laboratory: Con-Test Analytical Laboratory, Inc., E. Longmeadow, MA

Lab Sample ID: 17J0115

Sample Matrix: Groundwater

Analytical methods performed:		<u>MADEP-EPH-04-1.1</u>	
		<u>14 MCP total metals</u>	
Sample(s)		Notes	
Was the sample collected in the appropriate container?	<u>Yes</u>		
Was the correct preservative used for the method?	<u>Yes</u>		
Chain of Custody (COC)			
Are the date(s) and sample time(s) recorded on the COC?	<u>Yes</u>		
Was a CAM report requested from the lab?	<u>Yes</u>		
Was the sample temperature recorded on the COC?	<u>Yes</u>		
Is the "chain" of signatures unbroken?	<u>Yes</u>		
Methods			
Are all methods acceptable by MA-DEP?	<u>Yes</u>		
Were all analytes reported for each method?	<u>Yes</u>		
Laboratory			
Were the sample(s) analyzed within the appropriate holding time?	<u>Yes</u>		
Are the surrogate recoveries within the CAM acceptable range(s)?	<u>Yes</u>		
If surrogate recoveries were exceeded, was the batch accepted?	<u>Yes</u>		
Were Reporting Limits elevated for any reason?	<u>No</u>		
For analytes not detected, are lab PQLs ≤ applicable standards?	<u>Yes</u>		
Are other issues raised in the Case Narrative?	<u>Yes</u>	Chromium is found in the associated blank as well as in the sample. Data is not affected by elevated level in blank since sample(s) result is "Not Detected".	
QC Sample(s)			
Was a Field Duplicate submitted and analyzed?	<u>No</u>		
Was a matrix spike performed?	<u>No</u>		
Was a Trip Blank submitted and analyzed?	<u>No</u>		
MA-DEP Analytical Protocol Certification Form			
Were "Affirmative Responses" obtained for questions A - F?	<u>Yes</u>	Affirmative responses to questions A-F are required for "Presumptive Certainty" status.	
Were "responses" obtained for questions G, H, and I?	<u>Yes</u>	Responses to questions G, H, and I are required for "Presumptive Certainty" status.	
QA/QC Review			
Reviewed by: <u>Lyons Witten, PG, LSP</u>		Signature: <u>Lyons Witten</u>	
		Date: <u>10/25/2017</u>	

June 14, 2018

Lyons Witten
OHI Engineering, Inc. - Amherst
110 Pulpit Hill Road
Amherst, MA 01002

Project Location: EEM-Chicopee
Client Job Number:
Project Number: 15-1679
Laboratory Work Order Number: 18F0317

Enclosed are results of analyses for samples received by the laboratory on June 7, 2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Jessica Hoffman", is displayed on a light blue rectangular background.

Jessica L. Hoffman
Project Manager

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OHI Engineering, Inc. - Amherst
110 Pulpit Hill Road
Amherst, MA 01002
ATTN: Lyons Witten

REPORT DATE: 6/14/2018

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 15-1679

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 18F0317

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: EEM-Chicopee

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
OHI-13	18F0317-01	Ground Water		MADEP-EPH-04-1.1	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

MADEP-EPH-04-1.1

SPE cartridge contamination with non-petroleum compounds, if present, is verified by GC/MS in each method blank per extraction batch and excluded from C11-C22 aromatic range fraction in all samples in the batch. No significant modifications were made to the method.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

A handwritten signature in black ink, appearing to read "Lisa Worthington", is written over a light gray rectangular background.

Lisa A. Worthington
Project Manager

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: EEM-Chicopee

Sample Description:

Work Order: 18F0317

Date Received: 6/7/2018

Field Sample #: OHI-13

Sampled: 6/4/2018 16:20

Sample ID: 18F0317-01

Sample Matrix: Ground Water

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	200	100	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
C19-C36 Aliphatics	ND	100	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Unadjusted C11-C22 Aromatics	290	100	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
C11-C22 Aromatics	280	100	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Acenaphthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Acenaphthylene	4.0	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Benzo(a)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Benzo(a)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Benzo(b)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Benzo(g,h,i)perylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Benzo(k)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Chrysene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Dibenz(a,h)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Fluorene	2.2	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
2-Methylnaphthalene	2.6	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Naphthalene	2.4	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Phenanthrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW
Pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	6/11/18	6/13/18 0:21	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	64.2	40-140	
o-Terphenyl (OTP)	69.2	40-140	
2-Bromonaphthalene	81.6	40-140	
2-Fluorobiphenyl	86.5	40-140	

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Sample Extraction Data

Prep Method: SW-846 3510C-MADEP-EPH-04-1.1

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
18F0317-01 [OHI-13]	B205371	1000	2.00	06/11/18

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QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch B205371 - SW-846 3510C
Blank (B205371-BLK1)

Prepared: 06/11/18 Analyzed: 06/12/18

C9-C18 Aliphatics	ND	100	µg/L							
C19-C36 Aliphatics	ND	100	µg/L							
Unadjusted C11-C22 Aromatics	ND	100	µg/L							
C11-C22 Aromatics	ND	100	µg/L							
Acenaphthene	ND	2.0	µg/L							
Acenaphthylene	ND	2.0	µg/L							
Anthracene	ND	2.0	µg/L							
Benzo(a)anthracene	ND	2.0	µg/L							
Benzo(a)pyrene	ND	2.0	µg/L							
Benzo(b)fluoranthene	ND	2.0	µg/L							
Benzo(g,h,i)perylene	ND	2.0	µg/L							
Benzo(k)fluoranthene	ND	2.0	µg/L							
Chrysene	ND	2.0	µg/L							
Dibenz(a,h)anthracene	ND	2.0	µg/L							
Fluoranthene	ND	2.0	µg/L							
Fluorene	ND	2.0	µg/L							
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L							
2-Methylnaphthalene	ND	2.0	µg/L							
Naphthalene	ND	2.0	µg/L							
Phenanthrene	ND	2.0	µg/L							
Pyrene	ND	2.0	µg/L							
n-Decane	ND	2.0	µg/L							
n-Docosane	ND	2.0	µg/L							
n-Dodecane	ND	2.0	µg/L							
n-Eicosane	ND	2.0	µg/L							
n-Hexacosane	ND	2.0	µg/L							
n-Hexadecane	ND	2.0	µg/L							
n-Hexatriacontane	ND	2.0	µg/L							
n-Nonadecane	ND	2.0	µg/L							
n-Nonane	ND	2.0	µg/L							
n-Octacosane	ND	2.0	µg/L							
n-Octadecane	ND	2.0	µg/L							
n-Tetracosane	ND	2.0	µg/L							
n-Tetradecane	ND	2.0	µg/L							
n-Triacontane	ND	2.0	µg/L							
Naphthalene-aliphatic fraction	ND	2.0	µg/L							
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L							
Surrogate: Chlorooctadecane (COD)	79.5		µg/L	101		78.8	40-140			
Surrogate: o-Terphenyl (OTP)	81.5		µg/L	100		81.5	40-140			
Surrogate: 2-Bromonaphthalene	90.2		µg/L	100		89.9	40-140			
Surrogate: 2-Fluorobiphenyl	93.8		µg/L	101		93.0	40-140			

LCS (B205371-BS1)

Prepared: 06/11/18 Analyzed: 06/12/18

C9-C18 Aliphatics	427	100	µg/L	600		71.2	0-200			
C19-C36 Aliphatics	588	100	µg/L	800		73.5	0-200			
Acenaphthene	77.0	2.0	µg/L	100		77.0	40-140			
Acenaphthylene	74.7	2.0	µg/L	100		74.7	40-140			
Anthracene	84.9	2.0	µg/L	100		84.9	40-140			
Benzo(a)anthracene	88.3	2.0	µg/L	100		88.3	40-140			
Benzo(a)pyrene	84.5	2.0	µg/L	100		84.5	40-140			
Benzo(b)fluoranthene	85.6	2.0	µg/L	100		85.6	40-140			
Benzo(g,h,i)perylene	85.1	2.0	µg/L	100		85.1	40-140			

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QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B205371 - SW-846 3510C
LCS (B205371-BS1)

Prepared: 06/11/18 Analyzed: 06/12/18

Benzo(k)fluoranthene	85.1	2.0	µg/L	100		85.1	40-140			
Chrysene	88.3	2.0	µg/L	100		88.3	40-140			
Dibenz(a,h)anthracene	88.1	2.0	µg/L	100		88.1	40-140			
Fluoranthene	87.6	2.0	µg/L	100		87.6	40-140			
Fluorene	81.6	2.0	µg/L	100		81.6	40-140			
Indeno(1,2,3-cd)pyrene	79.7	2.0	µg/L	100		79.7	40-140			
2-Methylnaphthalene	73.8	2.0	µg/L	100		73.8	40-140			
Naphthalene	60.9	2.0	µg/L	100		60.9	40-140			
Phenanthrene	85.8	2.0	µg/L	100		85.8	40-140			
Pyrene	88.5	2.0	µg/L	100		88.5	40-140			
n-Decane	44.5	2.0	µg/L	100		44.5	40-140			
n-Docosane	78.5	2.0	µg/L	100		78.5	40-140			
n-Dodecane	60.6	2.0	µg/L	100		60.6	40-140			
n-Eicosane	76.7	2.0	µg/L	100		76.7	40-140			
n-Hexacosane	78.3	2.0	µg/L	100		78.3	40-140			
n-Hexadecane	76.3	2.0	µg/L	100		76.3	40-140			
n-Hexatriacontane	72.9	2.0	µg/L	100		72.9	40-140			
n-Nonadecane	76.8	2.0	µg/L	100		76.8	40-140			
n-Nonane	33.0	2.0	µg/L	100		33.0	30-140			
n-Octacosane	77.5	2.0	µg/L	100		77.5	40-140			
n-Octadecane	80.3	2.0	µg/L	100		80.3	40-140			
n-Tetracosane	78.1	2.0	µg/L	100		78.1	40-140			
n-Tetradecane	72.3	2.0	µg/L	100		72.3	40-140			
n-Triacontane	75.8	2.0	µg/L	100		75.8	40-140			
Naphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
Surrogate: Chlorooctadecane (COD)	79.6		µg/L	101		78.8	40-140			
Surrogate: o-Terphenyl (OTP)	81.1		µg/L	100		81.1	40-140			
Surrogate: 2-Bromonaphthalene	85.4		µg/L	100		85.0	40-140			
Surrogate: 2-Fluorobiphenyl	95.7		µg/L	101		94.9	40-140			

LCS Dup (B205371-BSD1)

Prepared: 06/11/18 Analyzed: 06/12/18

C9-C18 Aliphatics	436	100	µg/L	600		72.6	0-200	1.91		
C19-C36 Aliphatics	598	100	µg/L	800		74.8	0-200	1.72		
Acenaphthene	75.4	2.0	µg/L	100		75.4	40-140	2.09	25	
Acenaphthylene	73.1	2.0	µg/L	100		73.1	40-140	2.22	25	
Anthracene	84.1	2.0	µg/L	100		84.1	40-140	1.00	25	
Benzo(a)anthracene	87.1	2.0	µg/L	100		87.1	40-140	1.31	25	
Benzo(a)pyrene	83.1	2.0	µg/L	100		83.1	40-140	1.73	25	
Benzo(b)fluoranthene	84.4	2.0	µg/L	100		84.4	40-140	1.39	25	
Benzo(g,h,i)perylene	83.5	2.0	µg/L	100		83.5	40-140	1.94	25	
Benzo(k)fluoranthene	83.7	2.0	µg/L	100		83.7	40-140	1.68	25	
Chrysene	87.1	2.0	µg/L	100		87.1	40-140	1.42	25	
Dibenz(a,h)anthracene	86.3	2.0	µg/L	100		86.3	40-140	2.09	25	
Fluoranthene	86.1	2.0	µg/L	100		86.1	40-140	1.73	25	
Fluorene	80.0	2.0	µg/L	100		80.0	40-140	2.00	25	
Indeno(1,2,3-cd)pyrene	78.3	2.0	µg/L	100		78.3	40-140	1.76	25	
2-Methylnaphthalene	72.2	2.0	µg/L	100		72.2	40-140	2.19	25	
Naphthalene	61.5	2.0	µg/L	100		61.5	40-140	1.04	25	
Phenanthrene	84.8	2.0	µg/L	100		84.8	40-140	1.21	25	
Pyrene	87.4	2.0	µg/L	100		87.4	40-140	1.28	25	
n-Decane	48.2	2.0	µg/L	100		48.2	40-140	7.88	25	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch B205371 - SW-846 3510C
LCS Dup (B205371-BSD1)

Prepared: 06/11/18 Analyzed: 06/12/18

n-Docosane	78.8	2.0	µg/L	100		78.8	40-140	0.297	25	
n-Dodecane	61.0	2.0	µg/L	100		61.0	40-140	0.667	25	
n-Eicosane	76.5	2.0	µg/L	100		76.5	40-140	0.217	25	
n-Hexacosane	78.8	2.0	µg/L	100		78.8	40-140	0.550	25	
n-Hexadecane	75.5	2.0	µg/L	100		75.5	40-140	0.988	25	
n-Hexatriacontane	73.9	2.0	µg/L	100		73.9	40-140	1.41	25	
n-Nonadecane	76.9	2.0	µg/L	100		76.9	40-140	0.128	25	
n-Nonane	36.4	2.0	µg/L	100		36.4	30-140	9.54	25	
n-Octacosane	77.9	2.0	µg/L	100		77.9	40-140	0.469	25	
n-Octadecane	80.3	2.0	µg/L	100		80.3	40-140	0.0448	25	
n-Tetracosane	78.4	2.0	µg/L	100		78.4	40-140	0.427	25	
n-Tetradecane	71.2	2.0	µg/L	100		71.2	40-140	1.50	25	
n-Triacontane	76.4	2.0	µg/L	100		76.4	40-140	0.757	25	
Naphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
Surrogate: Chlorooctadecane (COD)	79.8		µg/L	101		79.0	40-140			
Surrogate: o-Terphenyl (OTP)	79.8		µg/L	100		79.8	40-140			
Surrogate: 2-Bromonaphthalene	83.9		µg/L	100		83.5	40-140			
Surrogate: 2-Fluorobiphenyl	92.7		µg/L	101		92.0	40-140			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>MADEP-EPH-04-1.1 in Soil</i>	
C9-C18 Aliphatics	CT,NC,ME,NH-P
C19-C36 Aliphatics	CT,NC,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,ME,NH-P
C11-C22 Aromatics	CT,NC,ME,NH-P
Acenaphthene	CT,NC,ME,NH-P
Acenaphthylene	CT,NC,ME,NH-P
Anthracene	CT,NC,ME,NH-P
Benzo(a)anthracene	CT,NC,ME,NH-P
Benzo(a)pyrene	CT,NC,ME,NH-P
Benzo(b)fluoranthene	CT,NC,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,ME,NH-P
Benzo(k)fluoranthene	CT,NC,ME,NH-P
Chrysene	CT,NC,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,ME,NH-P
Fluoranthene	CT,NC,ME,NH-P
Fluorene	CT,NC,ME
Indeno(1,2,3-cd)pyrene	CT,NC,ME,NH-P
2-Methylnaphthalene	CT,NC
Naphthalene	CT,NC,ME,NH-P
Phenanthrene	CT,NC,ME,NH-P
Pyrene	CT,NC,ME,NH-P
<i>MADEP-EPH-04-1.1 in Water</i>	
C9-C18 Aliphatics	CT,NC,ME,NH-P
C19-C36 Aliphatics	CT,NC,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,ME,NH-P
C11-C22 Aromatics	CT,NC,ME,NH-P
Acenaphthene	CT,NC,ME,NH-P
Acenaphthylene	CT,NC,ME,NH-P
Anthracene	CT,NC,ME,NH-P
Benzo(a)anthracene	CT,NC,ME,NH-P
Benzo(a)pyrene	CT,NC,ME,NH-P
Benzo(b)fluoranthene	CT,NC,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,ME,NH-P
Benzo(k)fluoranthene	CT,NC,ME,NH-P
Chrysene	CT,NC,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,ME,NH-P
Fluoranthene	CT,NC,ME,NH-P
Fluorene	CT,NC,ME
Indeno(1,2,3-cd)pyrene	CT,NC,ME,NH-P
2-Methylnaphthalene	CT,NC
Naphthalene	CT,NC,ME,NH-P
Phenanthrene	CT,NC,ME,NH-P
Pyrene	CT,NC,ME,NH-P

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	03/1/2020
MA	Massachusetts DEP	M-MA100	06/30/2018
CT	Connecticut Department of Public Health	PH-0567	09/30/2019
NY	New York State Department of Health	10899 NELAP	04/1/2019
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2019
RI	Rhode Island Department of Health	LAO00112	12/30/2018
NC	North Carolina Div. of Water Quality	652	12/31/2018
NJ	New Jersey DEP	MA007 NELAP	06/30/2018
FL	Florida Department of Health	E871027 NELAP	06/30/2018
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2018
ME	State of Maine	2011028	06/9/2019
VA	Commonwealth of Virginia	460217	12/14/2018
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2018
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2019
NC-DW	North Carolina Department of Health	25703	07/31/2018



Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com
www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Page 1 of 1

Company Name: OMA Engineering

Telephone: 413-835-0780

Project # #15-1700

Client PO# 15-1700

DATA DELIVERY (check all that apply)

☐ FAX ☒ EMAIL ☒ WEBSITE

Fax #

Attention: ROSS WITTEN, LSP

Email: written@shinyway.com

Format: ☒ EXCEL ☐ GIS

Project Location: EDM, CHICPEE

Sampled By: (Witten)

Project Proposal Provided? (for billing purposes)
☐ yes ☐ no

proposals date

Con-Test Lab ID (laboratory use only)

Client Sample ID / Description

Beginning Date/Time

Ending Date/Time

Collection

Matrix Conc Code

Grab

Con-Test Lab ID (laboratory use only)

Client Sample ID / Description

Beginning Date/Time

Ending Date/Time

Collection

Matrix Conc Code

Grab

Con-Test Lab ID (laboratory use only)

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Matrix Conc Code

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Con-Test Lab ID (laboratory use only)

Client Sample ID / Description

Beginning Date/Time

Ending Date/Time

Collection

Matrix Conc Code

Grab

Relinquished by: (signature)
Received by: (signature)
Inquired by: (signature)
Signed by: (signature)

Date/Time: 6/7/18
Date/Time: 6/7/18
Date/Time: 6/7/18
Date/Time: 6/7/18

Turnaround ^{††}
7-Day ☒
10-Day ☐
Other ☐

RUSH [†]
☐ 24-Hr ☐ 48-Hr
☐ 72-Hr ☐ 14-Day

Require lab approval

Detection Limit Requirements

Massachusetts:

Connecticut:

Other:

Is your project MCP or RCP?

☒ MCP Form Required
☐ RCP Form Required
☐ MA State DW Form Required PWSID #

NELAC & AIHA-LAP, LLC
Accredited

WBE/DBE Certified

PLEASE BE CAREFUL NOT TO CONTAMINATE THIS DOCUMENT

IF THIS FORM IS NOT FILLED OUT COMPLETELY OR

Table of Contents


con-test®
 ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False

Statement will be brought to the attention of the Client - State True or False

Client OHI

Received By SE Date 6/7/18 Time 14:45

How were the samples received? In Cooler T No Cooler On Ice T No Ice
 Direct from Sampling Ambient Melted Ice

Were samples within Temperature? 2-6°C T By Gun # 8 Actual Temp - 2.6
 By Blank # Actual Temp -

Was Custody Seal Intact? N/A Were Samples Tampered with? N/A
 Was COC Relinquished? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T
 Did COC include all Client T Analysis T Sampler Name T
 pertinent Information? Project T ID's T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified?
 Are there Rushes? F Who was notified?
 Are there Short Holds? F Who was notified?

Is there enough Volume? T

Is there Headspace where applicable? N/A MS/MSD? F
 Proper Media/Containers Used? T Is splitting samples required? F
 Were trip blanks received? F On COC? N/A
 Do all samples have the proper pH? T Acid pH < 2 Base

Vials	#	Containers:	#	#	#	#
Unp-		1 Liter Amb.	<u>2</u>	1 Liter Plastic		16 oz Amb.
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear
DI-		Other Plastic		Other Glass		Encore
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:
Sulfuric-		Perchlorate		Ziplock		

Unused Media

Vials	#	Containers:	#	#	#	#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear
DI-		Other Plastic		Other Glass		Encore
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:
Sulfuric-		Perchlorate		Ziplock		

Comments:

MADEP MCP Analytical Method Report Certification Form

Laboratory Name: Con-Test Analytical Laboratory				Project #: 18F0317	
Project Location: EEM-Chicopee				RTN:	
This Form provides certifications for the following data set: [list Laboratory Sample ID Number(s)] 18F0317-01					
Matrices: Water					
CAM Protocol (check all that below)					
8260 VOC CAM II A ()	7470/7471 Hg CAM IIIB ()	MassDEP VPH CAM IV A ()	8082 PCB CAM V A ()	9014 Total Cyanide/PAC CAM VI A ()	6860 Perchlorate CAM VIII B ()
8270 SVOC CAM II B ()	7010 Metals CAM III C ()	MassDEP VPH CAM IV C ()	8081 Pesticides CAM V B ()	7196 Hex Cr CAM VI B ()	MassDEP APH CAM IX A ()
6010 Metals CAM III A ()	6020 Metals CAM III D ()	MassDEP EPH CAM IV A (X)	8151 Herbicides CAM V C ()	8330 Explosives CAM VIII A ()	TO-15 VOC CAM IX B ()
Affirmative response to Questions A through F is required for "Presumptive Certainty" status					
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?				☒ Yes ☐ No ¹
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?				☒ Yes ☐ No ¹
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?				☒ Yes ☐ No ¹
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?				☒ Yes ☐ No ¹
E a	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).				☒ Yes ☐ No ¹
E b	APH and TO-15 Methods only: Was the complete analyte list reported for each method?				☐ Yes ☐ No ¹
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all No responses to Questions A through E)?				☒ Yes ☐ No ¹
A response to questions G, H and I below is required for "Presumptive Certainty" status					
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?				☒ Yes ☐ No ¹
Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.					
H	Were all QC performance standards specified in the CAM protocol(s) achieved?				☒ Yes ☐ No ¹
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?				☒ Yes ☐ No ¹
¹ All Negative responses must be addressed in an attached Environmental Laboratory case narrative.					
I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.					
Signature: <u>Lisa Worthington</u>		Position: <u>Project Manager</u>			
Printed Name: <u>Lisa A. Worthington</u>		Date: <u>06/14/18</u>			

QA/QC Worksheet for Laboratory Results

-- Data Usability & Presumptive Certainty Analysis --



110 Pulpit Hill Road
Amherst, MA 01002
(413) 835-0780 Phone
(413) 549-7918 Fax

Job No & Site Name: **15-1700**

Client: **Eastern Etching & Manufacturing**

Location: **35 Lower Grape Street, Chicopee, MA**

OHI Sampler(s): **WLW**

Sampling Date: **June 4, 2018**

Laboratory: **Con-Test Analytical Laboratory, Inc., E. Longmeadow, MA**

Lab Sample ID: **18F0317**

Sample Matrix: **Groundwater**

Analytical methods performed: <u>MADEP-EPH-04-1.1</u>		
Sample(s)		Notes
Was the sample collected in the appropriate container?	<u>Yes</u>	
Was the correct preservative used for the method?	<u>Yes</u>	
Chain of Custody (COC)		
Are the date(s) and sample time(s) recorded on the COC?	<u>Yes</u>	
Was a CAM report requested from the lab?	<u>Yes</u>	
Was the sample temperature recorded on the COC?	<u>Yes</u>	
Is the "chain" of signatures unbroken?	<u>Yes</u>	
Methods		
Are all methods acceptable by MA-DEP?	<u>Yes</u>	
Were all analytes reported for each method?	<u>Yes</u>	
Laboratory		
Were the sample(s) analyzed within the appropriate holding time?	<u>Yes</u>	
Are the surrogate recoveries within the CAM acceptable range(s)?	<u>Yes</u>	
If surrogate recoveries were exceeded, was the batch accepted?	<u>Yes</u>	
Were Reporting Limits elevated for any reason?	<u>No</u>	
For analytes not detected, are lab PQLs $\leq$ applicable standards?	<u>Yes</u>	
Are other issues raised in the Case Narrative?	<u>No</u>	
QC Sample(s)		
Was a Field Duplicate submitted and analyzed?	<u>No</u>	
Was a matrix spike performed?	<u>No</u>	
Was a Trip Blank submitted and analyzed?	<u>No</u>	
MA-DEP Analytical Protocol Certification Form		
Were "Affirmative Responses" obtained for questions A - F?	<u>Yes</u>	Affirmative responses to questions A-F are required for "Presumptive Certainty" status.
Were "responses" obtained for questions G, H, and I?	<u>Yes</u>	Responses to questions G, H, and I are required for "Presumptive Certainty" status.
QA/QC Review		
Reviewed by: <u>Lyons Witten, PG, LSP</u>	Signature: <u>Lyons Witten</u>	
	Date: <u>6/16/2018</u>	

APPENDIX I

Draft AUL Document

THIS DOCUMENT IS A DRAFT, AWAITING FINAL PLANS FOR RECORDING

Form 1075

NOTICE OF ACTIVITY AND USE LIMITATION

M.G.L. c. 21E, § 6 and 310 CMR 40.0000

Disposal Site Name: Eastern Etching & Manufacturing, Inc.
DEP Release Tracking No.(s): 1-20060

This Notice of Activity and Use Limitation ("Notice") is made as of this ____ day of _____, 2019, by Eastern Etching and Manufacturing, Inc., together with his/her/its/their successors and assigns (collectively "Owner").

W I T N E S S E T H:

WHEREAS, Eastern Etching and Manufacturing Company is the owner in fee simple of certain parcels of land located in Chicopee, Hampden County, Massachusetts with the buildings and improvements thereon, pursuant to deeds recorded with the Hamden County Registry of Deeds in Book 1706, Page 42, Book 1753, Page 541, Book 5754, Page 256, and Book 5754, Page 262;

WHEREAS, said parcels of land, which are more particularly bounded and described in **Exhibit A**, attached hereto and made a part hereof ("Property") are subject to this Notice of Activity and Use Limitation. The Property is shown on a plan recorded in the Hamden County Registry of Deeds in **Plan Book** _____, **Plan**_____;

WHEREAS, a portion of the Property ("Portion of the Property") is subject to this Notice of Activity and Use Limitation. The Portion of the Property is more particularly bounded and described in **Exhibit A-1**, attached hereto and made a part hereof. The Portion of the Property is shown on a plan recorded with the Registry of Deeds in **Plan Book** _____, **Plan**_____;

WHEREAS, the Portion of the Property comprises all of a disposal site as the result of a releases of oil and/or hazardous material. Exhibit B is a sketch plan showing the

relationship of the Portion of the Property subject to this Notice of Activity and Use Limitation to the boundaries of said disposal site existing within the limits of the Property and to the extent such boundaries have been established. Exhibit B is attached hereto and made a part hereof; and

WHEREAS, one or more response actions have been selected for the Disposal Site in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 ("MCP"). Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil and/or (b) the restriction of certain activities occurring in, on, through, over or under the Portion of the Property. A description of the basis for such restrictions, and the oil and/or hazardous material release events or site history that resulted in the contaminated media subject to the Notice of Activity and Use Limitation is attached hereto as Exhibit C and made a part hereof

NOW, THEREFORE, notice is hereby given that the activity and use limitations set forth in this Notice of Activity and Use Limitation are as follows:

1. Permitted Activities and Uses Consistent with Maintaining No Significant Risk Conditions. The following Activities and Uses are consistent with maintaining a Permanent Solution and a condition of No Significant Risk and, as such, may occur on the Portion of the Property pursuant to 310 CMR 40.0000:

- (i) Activities and uses including, but not limited to sales, manufacturing, warehousing, storage, operation & maintenance of facilities, vehicular parking, pedestrian and vehicular traffic which do not compromise the structural integrity of the pavement and/or disturb lead and/or petroleum-impacted soil located beneath the pavement;
- (ii) Excavation associated with emergency or short term (three months or less) underground utility and/or construction work, provided it is conducted in accordance with a Soil Management Plan and a Health & Safety Plan in accordance with Obligations (i) and (ii) of this Opinion; and involves the repair and/or replacement of the pavement with a comparable barrier immediately following the completion of the project;
- (iii) Relocation of soil is permitted within AUL AREA, provided the activities conform to the conditions outlined in Section 3 of this Notice of AUL (Obligations and Conditions);
- (iv) Use of the AUL AREA for single-family or multi-family residence, school, daycare, nursery, playground, recreational area, and/or other such activities or uses where a child is likely to be present, provided the activities conform to the conditions outlined in Section 3 of this Notice of AUL (Obligations and Conditions);
- (v) Activities and Uses which are not identified in this Opinion as being inconsistent with maintaining a condition of No Significant Risk;

- (vi) Such other activities or uses which, in the Opinion of a Licensed Site Professional, shall present no greater risk of harm to health, safety, public welfare or the environment than the activities and uses set forth in this Paragraph; and
- (vii) Such other activities and uses not identified in Paragraph 2 as being Activities and Uses Inconsistent with Maintaining No Significant Risk Conditions.

2. Activities and Uses Inconsistent with Maintaining No Significant Risk Conditions.

The following Activities and Uses are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk pursuant to 310 CMR 40.0000, and, as such, may not occur on the Portion of the Property:

- (i) Activities and/or uses which are likely to involve the removal and/or disturbance of the pavement in the AUL Area and/or the disturbance of the lead and/or petroleum-impacted soil located beneath the pavement without prior development of a Soil Management Plan and a Health & Safety Plan in accordance with Obligations (i) and (ii) of this Opinion;
- (ii) Relocation of the lead and/or petroleum-impacted soil from beneath the pavement in the AUL Area unless an LSP renders an Opinion which states that such relocation is consistent with maintaining a condition of No Significant Risk; and
- (iii) Activities and/or uses which may cause physical or chemical deterioration, breakage, or structural damage to the pavement.

3. Obligations and Conditions. The following obligations and/or conditions are necessary and shall be undertaken and/or maintained at the Portion of the Property to maintain a Permanent Solution and a condition of No Significant Risk:

- (i) A Soil Management Plan must be prepared by an LSP and implemented prior to the commencement of any activity that is likely to disturb the lead and/or petroleum-impacted soil located immediately beneath the pavement. The Soil Management Plan should describe appropriate soil excavation, handling, storage, transport, and disposal procedures and include a description of the engineering controls and air monitoring procedures necessary to ensure that workers and receptors in the vicinity are not affected by fugitive dust or particulates. On-site workers must be informed of the requirements of the Soil Management Plan, and the plan must be available on-site throughout the course of the project;
- (ii) A Health and Safety Plan must be prepared by a Certified Industrial Hygienist or other qualified individual sufficiently trained in worker health and safety requirements and implemented prior to the commencement of any activity which involves the removal and/or disturbance of the pavement and/or is likely to disturb

the underlying lead and/or petroleum-impacted soil, rendering it more accessible. The plan should clearly describe the location of the lead-contaminated soil and specifically identify the types of personal protective equipment, monitoring devices, and engineering controls necessary to ensure that workers are not exposed to lead through dermal contact, ingestion, and/or the inhalation of particulate dusts. Workers who may come in contact with lead and/or petroleum-impacted soil within the designated AUL area must be informed of the location of the contamination and all requirements of the Health and Safety Plan. The plan must be available on-site throughout the course of the project;

- (iii) The pavement within the AUL Area must be repaired and/or replaced with a comparable barrier to prevent future exposures to underlying lead and/or petroleum-impacted soil immediately following the completion of any activity which involves its removal and/or disturbance;
- (iv) The pavement must be maintained within the designated AUL area to ensure that the lead and/or petroleum-impacted soil located beneath the pavement remains inaccessible; and
- (v) Annual inspections and associated record-keeping activities must be performed to confirm that the pavement is being properly maintained to prevent exposure(s) to lead and/or petroleum-impacted soil located beneath the pavement.

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Portion of the Property which may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by a Licensed Site Professional who shall render an Opinion, in accordance with 310 CMR 40.1080, as to whether the proposed changes are inconsistent with maintaining a Permanent Solution and a condition of No Significant Risk. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Permanent or Temporary Solution. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by a Licensed Site Professional in accordance with 310 CMR 40.1080, and without additional response actions, if necessary, to maintain a condition of No Significant Risk.

If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by a Licensed Site Professional in accordance with 310 CMR 40.1080, the owner or operator of the Portion of the Property subject to this Notice at the time that the activities, uses and/or exposures change, shall comply with the requirements set forth in 310 CMR 40.0020.

6. Incorporation Into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Property or a portion thereof is conveyed in accordance with 310 CMR 40.1074(5).

Owner hereby authorizes and consents to the filing and recordation and/or registration of this Notice, said Notice to become effective when executed under seal by the undersigned Licensed Site Professional, and recorded and/or registered with the appropriate Registry of Deeds and/or Land Registration Office(s).

WITNESS the execution hereof under seal this _____ day of _____, 2019.

Eastern Etching and Manufacturing, Inc.

By _____
It's President

Eastern Etching and Manufacturing, Inc.

By _____
It's Treasurer

COMMONWEALTH OF MASSACHUSETTS

Hampden, ss.

On this ____ day of _____, 2019, before me, the undersigned notary public, personally appeared _____ proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose, as President of Eastern Etching and Manufacturing, Inc.

Notary Public
My commission expires:

Hampden, ss.

On this ____ day of _____, 2019, before me, the undersigned notary public, personally appeared _____ proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose, as Treasurer of Eastern Etching and Manufacturing, Inc.

Notary Public
My commission expires:

COMMONWEALTH OF MASSACHUSETTS

The undersigned LSP hereby certifies that he executed the aforesaid Activity and Use Limitation Opinion attached hereto as Exhibit C and made a part hereof and that in his Opinion this Notice of Activity and Use Limitation is consistent with the terms set forth in said Activity and Use Limitation Opinion.

Date: _____

Lyons Witten, LSP

[LSP SEAL]

Hampden, ss.

On this ____ day of _____, 2019, before me, the undersigned notary public, personally appeared Lyons Witten, proved to me through satisfactory evidence of identification, which were MA driver's license, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

My commission expires: Notary Public

Upon recording, return to:

Eastern Etching & Manufacturing, Inc.
Mike Cocco, Operations Manager
35 Lower Grape Street
Chicopee, MA 01020

APPENDIX J

Public Involvement

January 14, 2020

Mayor Richard J. Kos
Mayor's Office
17 Springfield Street
Chicopee, MA 01013

Chicopee Board of Health
Health Department
115 Baskin Drive
Chicopee, MA 01020

VIA: CERTIFIED MAIL

**Re: Permanent Solution with Conditions Statement
Eastern Etching & Manufacturing, Inc.
35 Lower Grape Street
Chicopee, Massachusetts**

**DEP RTN: #1-20060
OHI Project #15-1700**

Dear City Officials,

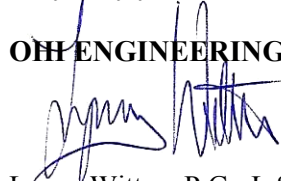
In accordance with the requirements of the Massachusetts Contingency Plan (MCP), OHI Engineering, Inc. is writing to notify you, as the Chief Municipal Officer and the Board of Health, that a *Permanent Solutions Statement with Conditions Submittal* has been submitted to the Massachusetts Department of Environmental Protection (MassDEP) for the presence of petroleum and lead-impacted soils on a portion of the Eastern Etching & Manufacturing, Inc. property.

The *Permanent Solutions Statement with Conditions Submittal* is available at the MassDEP at 436 Dwight Street in Springfield, Massachusetts and at the DEP's web site:
<https://eeaonline.eea.state.ma.us/portal#!/home> using the RTN above.

Please contact me if you have any questions or concerns.

Very truly yours,

OHI ENGINEERING, INC.



Lyons Witten, P.G., L.S.P.
Regional Manager



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Mansfield, MA 02048
Tel (508) 339-3929
Fax (508) 339-3140

110 Pulpit Hill Road
Amherst, MA 01002
Tel (413) 835-0780
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P.O. Box 579
Chester, VT 05143
Tel (802) 885-1909

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