PROPOSED REMEDIAL ACTION PLAN

Chevron Former Asphalt Facility
State Superfund Project
Troy, Rensselaer County
Site No. 442029B
January 2019

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

A public comment period has been set from:

February 1, 2019 thru March 2, 2019

A public meeting is scheduled for the following date:

February 20, 2019, 7:00 pm

Public meeting location:

Troy City Hall
433 River Street
Troy, NY 12180

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through to:

John Spellman
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
john.spellman@dec.ny.gov

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location - The site is located in Troy, Rensselaer County, on Water Street along the Hudson River bank, approximately 1,000 feet from the intersection of Water Street with US Route 4.

Site Features - The seven-acre site is a vacant lot. The Menands Bridge crosses over the northern edge of the site with a bridge pier located on the site. The site is flat except for a steep bank at the Hudson River shoreline. The bank has dense vegetative growth which includes a substantial population of large diameter hardwood trees.

Current Zoning and Land Use - The site is zoned Waterfront Trade District, an industrial use classification. Surrounding parcel uses include a railroad, waste transfer station and wastewater treatment facility. The nearest residential property is approximately 300 feet east of the site.

Past Use of Site: Prior to 1955 the site was owned by a succession of companies as part of a large tract of land upon which a manufactured gas plant (MGP) operated. From 1953 to 1999 the site was used for asphalt storage and distribution which operated under a Major Oil Storage Facility (MOSF) Permit pursuant to State of New York Navigation Law. Asphalt was moved from barges to storage tanks through a series of heated pipes that maintained the asphalt at sufficiently high temperature such that the material would flow. An asphalt emulsion mixing process took place in a building at the southern end of the site. The above ground storage tanks were removed in 2006.

The former MGP operational area has been assigned NYSDEC site number 442029 is being remediated separate from the Chevron Former Asphalt Facility Site. Hudson River sediments associated with the MGP, including sediments adjacent to the Chevron Site, are being investigated under site number 442029.

Site Geology and Hydrogeology: The site is characterized by extensive filling of the Hudson Riverbank with slag, cinders, brick, gravel and other materials to a depth of approximately 40 feet below ground surface. The fill overlies a sequence of river and glacial lake deposits that in aggregate range in thickness from 5 to 70 feet. Below the deposit is bedrock consisting of a thinly bedded gray to black shale. Groundwater is approximately 25 feet below the surface, flowing generally to the west towards the Hudson River.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) are/is being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

Chevron USA Inc.

The Department and Chevron USA Inc. entered into a Consent Order on November 22, 2013. The Order obligates Chevron to implement a full remedial program for the on-site area.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information;
- Geophysical survey to determine the lateral extent of wastes;
- Test pits, soil borings, and monitoring well installations;
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor;
- Sampling of surface water and sediment; and,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- groundwater
- soil

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The

contaminants of concern identified at this site are:

tar	benzo(a)pyrene
total polycyclic aromatic hydrocarbons	benzo(a)anthracene
toluene	benzo(b)fluoranthene
xylene (mixed)	dibenz[a,h]anthracene
benzene	arsenic
ethylbenzene	

As illustrated in Exhibit A, the contaminants of concern exceed the applicable SCGs for:

- groundwater
- soil

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

There were no IRMs performed at this site during the RI.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for the site.

Nature and Extent of Contamination: A reconnaissance of the site surface, including the Hudson River streambank, and borings into the site subsurface revealed the presence of a tarry or asphaltic substance in certain locations. On the surface, east of the streambank, 30 tar/asphalt deposits were recorded across the site. The viscous deposits, typically a few inches thick, were randomly distributed but more prevalent in the central area, likely due to releases from former MOSF operations. Along the streambank a hard tar/asphalt was observed integrated within tree roots and other vegetation for an approximate length of 700 feet along the bank. The reconnaissance also showed the presence of purifier box waste residue in one area near the northern limit of the site along the riverbank surface. Purifier box waste originates at manufactured gas plants, where a combustible gas for consumers was produced from coal and the gas was purified by routing it through wood chips and iron filings. The waste is typically found as a dark mixture of wood chips with a very strong and unpleasant sulfur-like odor.

Twenty-three borings were advanced to a depth of at least 15 feet during the RI to characterize the subsurface. No visual impacts except for occasional staining were noted in 20 of the borings. Of

the remaining borings a “viscous”, “sticky”, “tar-like” material was described generally between 10 and 12 feet below ground surface. The tar-like material was observed in the central portion of the site and extending over approximately one-quarter acre. The subsurface tar was not observed in borings along the north, east and south edges of the site. Due to the observance of visually clean fill material over the tar-like material, the Department concludes it is an older deposit that pre-dates the MOSF.

In addition to the reconnaissance, surface soils, subsurface soils and groundwater were sampled and analyzed for semi-volatile organic compounds (SVOCs) including polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), metals, cyanide, pesticides and polychlorinated biphenyls (PCBs) during the RI. Based upon investigations conducted to date, the primary contaminants of concern include benzene, toluene, ethylbenzene and xylene (BTEX) and PAHs. Individual PAHs that are the focus of the remedy include benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene and dibenz(a,h)anthracene.

Soil – The majority of visually clean surface soil samples were found to satisfy the commercial use SCOs. However, several surface soil samples exceeded the commercial use SCO in the area of the former above-ground storage tanks and in a wooded area at the southern end of the site. For soil samples analyzed within the top two inches of the surface, benzo(a)pyrene exceeded the commercial use SCO (1 ppm) in two samples, with the higher concentration being 3.64 ppm and arsenic exceeded the commercial use SCO (16 ppm) at one location with a concentration of 20.8 ppm (Figure 3).

Subsurface soil at 13 locations over approximately one-half acre contained PAHs in excess of the Commissioner's Policy CP-51 objective of less than 500 parts per million (ppm) total PAHs for nonresidential areas with an institutional control. These exceedances were typically located at a depth of 9 to 11 feet below grade and were co-located with a subsurface asphalt/tar layer. The highest total PAH concentration was 23,850 ppm found at a depth of 9.5 feet, adjacent to a former naphtha tank. Benzo(a)pyrene was found in a soil sampled collected at a 37.5 foot depth at a concentration of 2.4 ppm, exceeding the unrestricted use soil cleanup objective (SCO) of 1 ppm. Arsenic was detected at certain locations up to a concentration of 80.8 ppm., exceeding the commercial and industrial SCO of 16 ppm.

In the northern portion of the former above-ground storage tank area of the site, PAHs were detected above commercial and industrial use SCOs. Higher concentrations of PAHs were found approximately 9 to 11-feet below grade and are generally co-located with a subsurface asphalt/tar layer.

Groundwater samples did not exceed standards or guidance values for volatile organic compounds. Also, groundwater samples typically did not exceed standards or guidance values for semi-volatile organic compounds. However, as shown in Exhibit A Table 1, low concentrations of certain PAHs occasionally exceeded their respective standards or guidance. Benzo(a)pyrene was detected in two samples at a concentration up to 1 ppb, exceeding the groundwater standard of non-detect. Data does not indicate any off-site impacts to groundwater related to this site.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure.*

People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Access to the site is restricted by a fence. However, people who enter may come into contact with contact with contaminants in soil by walking on the site, digging or otherwise disturbing the soil.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Prevent the discharge of contaminants to surface water.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: SUMMARY OF THE PROPOSED REMEDY

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's proposed remedy is set forth at Exhibit D.

The proposed remedy is referred to as the Surface Waste Removals and Soil Cover Remedy.

The estimated present worth cost to implement the remedy is $1,820,000. The cost to construct the remedy is estimated to be $1,390,000 and the estimated average annual cost is $10,000.

The elements of the proposed remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Excavation and off-site disposal of contaminant source areas, including
- tar, asphalt or purifier waste deposits
- soils that create a nuisance condition, as defined in Commissioner Policy CP-51 Section G.

2a. Site area east of the top of Hudson Riverbank (upland area)
Wastes or soils meeting the criteria above will be removed to a depth of one-foot. Based on the sporadic finding of these wastes and soils, several excavations areas are envisioned. If wastes or soils meeting the criteria are observed at the one-foot depth, then excavation will continue until the criteria are no longer observed, to a maximum depth of eight feet below ground surface (bgs). The remedial design program will confirm the areal and depth extents of the tar/asphalt and purifier waste deposits.

2b. Site area west of the top of Hudson Riverbank (stream bank area)
Wastes or soils meeting the criteria above will be removed to a depth of two-feet bgs. The plan is to protect and maintain the existing vegetation, to the extent practicable. The Department anticipates less intrusive excavation techniques will be utilized to remove the hard tar deposits observed at the surface. If vegetation is disturbed, the vegetation will be restored through a combination of topsoil placement, biodegradable erosion matting, and planting/seeding, as appropriate, based on pre-existing conditions. Tar/asphalt is not expected in the bank at a depth greater than two feet. However, the Site Management Plan identified in item number 6 below will provide for the monitoring of the streambank for the potential migration of tar/asphalt to the surface, with additional removals as necessary.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) for commercial use will be brought in to complete the backfilling of the excavation and establish the designed grades at the site. For the streambank and extending 20 feet inland from the top of bank, clean fill will meet the requirements for the protection of ecological resources. The design will include a restoration plan and a monitoring plan for all streambank areas disturbed by the remedy and all streambank activities will be consistent with the requirements of 6 NYCRR Part 608.

3. A site cover will be required to allow for commercial use of the site in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is to be used it will be a minimum of one foot of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment, should redevelopment be planned in conjunction with site cleanup. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

The area of existing trees and other vegetative growth in the southern area of the site may remain as part of the site cover.

4. The site perimeter fencing will be inspected for defects and corrected as needed to prevent unauthorized entry.

5. Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for commercial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

6. A Site Management Plan is required, which includes the following:

1. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in Paragraph 5 above.

Engineering Controls: The soil cover discussed in Paragraph 3 and 4 above.

This plan includes, but may not be limited to:

a. an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

o descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;

o a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;

o provisions for the management and inspection of the identified engineering controls;

o maintaining site access controls and Department notification; and

o the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

o a schedule of monitoring and frequency of submittals to the Department;

o monitoring for vapor intrusion for any future buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

o monitoring of restoration activities along the streambank

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. Where appropriate, the 2005 Major Oil Storage Facility Closure Report was included in the evaluation. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium for which contamination was identified, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into four categories: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/ polychlorinated biphenyls (PCBs), and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 4 and Section 6.1.1 are also presented.

Waste/Source Areas

As identified in the RI report, waste/source materials were identified at the site and are impacting soil. These waste/source materials are described in Section 6.3. The RI did not extend into the Hudson River, therefore the impact of these waste materials on surface water and sediment is not known at this time and will be addressed at a later date under a separate operable unit.

Wastes are defined in 6 NYCRR Part 375-1.2 (aw) and include solid, industrial and/or hazardous wastes. Source areas are defined in 6 NYCRR Part 375 (au). Source areas are areas of concern at a site where substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium.

The waste at this site has not been demonstrated to leach contaminants at or otherwise contribute to a significant contravention of groundwater standards based on the groundwater data (presented below).

The waste/source areas identified will be addressed in the remedy selection process.

Groundwater

Groundwater samples were collected in shallow overburden groundwater. During the MOSF closure investigation, samples were collected using both a temporary sampling device and permanent monitoring wells. Groundwater samples collected during the RI were from permanent monitoring wells.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Benzene	ND – 0.6	1	0 of 19
SVOCs			
Benzo (a) pyrene	ND – 1	>ND	2 of 21
Benzo (b) fluoranthene	ND – 1	0.002	2 of 21
Benzo (a) anthracene	ND – 0.845	0.002	1 of 21
Benzo (k) fluoranthene	ND – 0.131	0.002	1 of 21
Chrysene	ND – 0.53	0.002	1 of 21
Indeno (1,2,3 -cd) pyrene	ND – 0.155	0.002	1 of 21

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.

b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Groundwater was sampled annually for semi-volatile compounds during the MOSF operational period. The groundwater was also sampled during MOSF closure for volatile and semi-volatile compounds. In addition, the groundwater was sampled during the RI for VOCs, SVOCs, pesticides, PCBs, metals and cyanide. Of the BTEX compounds, only benzene was detected and at a concentration that was below the groundwater standard of 1 ppb. Semi-volatile compounds were also typically not detected. Benzo (a) pyrene was detected in two samples at a concentration up to 1 ppb, exceeding the groundwater standard of non-detect. The higher detection was from a sample collected near the former Emulsion Building. Certain metals were detected in groundwater, but in concentrations below their respective groundwater standard. Pesticides, PCBs and cyanide were not detected.

No site-related groundwater contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for groundwater.

Soil

Surface and subsurface soil samples were collected at the site during the RI and during the MOSF closure investigation. Surface soil samples were collected from a depth of 0-2 inches to assess direct human exposure during the RI and collected from a depth of 0-6 inches during the closure investigation. Subsurface soil samples were collected from a depth of 2 - 40 feet to assess soil contamination impacts to groundwater.

Table 2 - Surface Soil

Detected Constituents	Concentration Range Detected	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use Commercial SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					
benzene	ND - 0.75	0.06	1 of 44	44	0 of 49
SVOCs					
Benzo a pyrene Indeno (1,2,3-cd) pyrene	ND – 15 ND – 7.7	1 0.5	16 of 44 16 of 44	1 5.6	16 of 44 4 of 44
Inorganics					
Arsenic	6.4 - 34	13	2 of 9	16	2 of 9

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use, unless otherwise noted.

Surface soil: For volatile organic compounds, there were no exceedances of the commercial use SCO, and one exceedance for the unrestricted use SCO. For semi-volatile organic compounds, certain PAHs, specifically benzo(a)pyene, benzo (a) anthracene, benzo(b)fluoranthene and dibenz(a,h)anthracene, occasionally exceeded their respective unrestricted use SCOs. Benzo(a)pyrene exceeded the commercial use SCO (1 ppm) in 16 out of 44 samples for samples collected within the top one-foot of the surface, with the highest concentration being 15 ppm at AST-20, near the former Emulsion Blending Building. Within the top two-inches of the surface benzo(a)pyrene was found at a maximum concentration of 3.64 ppm, within a wooded area (Figure 3). Certain metals were found to occasionally exceed the unrestricted use SCO, but not exceed the

commercial use SCO. An exception was arsenic, which was found at 34 ppm at the surface of SB-8, in the wooded area at the south edge of the site, exceeding both the commercial and industrial SCO of 16 ppm. PCBs and cyanide were found to be either not detected or below their respective unrestricted SCO. Pesticides were not detected except for one sample containing 0.0094 ppm 4,4 -DDT, exceeding the unrestricted use SCO of 0.0033 ppm but below the commercial SCO of 47 ppm.

Subsurface soil: At the northern edge of the site, PAHs were found in concentrations exceeding both commercial and industrial SCOs at sampling locations DPT-02 and SB-06. Arsenic was detected at a concentration of 80.8 ppm at a depth of 1 to 2 feet at SB-1 (located in "Grid Box 3", Figure 3), exceeding the commercial and industrial SCO of 16 ppm. Samples collected from soil borings advanced along the eastern edge of the site did not contain concentrations of PAHs exceeding the commercial or industrial use SCOs. This finding supports the conclusion that impacts from site-related constituents do not extend eastward off the site. In the northern portion of the former above-ground storage tank area of the site, PAHs were detected above commercial and industrial use SCOs. Higher concentrations of PAHs were found approximately 9 to 11 feet below grade and are generally co-located with the subsurface asphalt/tar layer described under Waste/Source Areas discussed above.

Subsurface soil samples collected in the southern wooded area of the site did not exceed the unrestricted use SCOs for PAHs. This finding supports the conclusion that impacts from site-related constituents do not extend southward off the site.

The primary soil contaminants are polycyclic aromatic hydrocarbons (PAHs) associated with residues from the operation of the former MOSF and from the operation of the former coke plant.

Table 3 - Subsurface Soil

Detected Constituents	Concentration Range Detected	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use Commercial SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					
Benzene	ND – 440	0.06	9 of 42	44	1 of 42
Ethylbenzene	ND – 21	1	5 of 42	390	0 of 42
Toluene	ND – 580	0.7	7 of 42	500	0 of 42
Xylene	ND - 480	0.26	9 of 42	500	0 of 42

Detected Constituents	Concentration Range Detected	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use Commercial SCG[c] (ppm)	Frequency Exceeding Restricted SCG
SVOCs					
Acenaphthene	ND – 120	20	11 of 62	500	0 of 62
Acenaphthalene	ND – 500	100	9 of 62	500	0 of 62
Anthracene	ND – 1,000	100	12 of 62	500	8 of 62
Benzo(a)anthracene	ND – 2,100	1	18 of 62	5.6	14 of 62
Benzo(a)pyrene	ND – 1,600	1	17 of 62	1	17 of 62
Benzo(b)fluoranthene	ND - 3,600	1	21 of 62	5.6	14 of 62
Benzo(g,h,i)perlene	ND – 480	100	11 of 62	500	0 of 62
Benzo(k)fluoranthene	ND – 1,000	0.8	16 of 62	56	12 of 62
Chrysene	ND – 1,700	1	18 of 62	56	5 of 62
Dibenz(a,h)anthracene	ND – 340	0.33	16 of 62	0.56	16 of 62
Fluoranthene	ND – 3,700	100	12 of 62	500	11 of 62
Fluorene	ND – 1,300	30	12 of 62	500	9 of 62
Indeno(1,2,3-cd)pyrene	ND - 500	0.5	23 of 62	5.6	13 of 62
Naphthalene	ND – 7,200	12	12 of 62	500	9 of 62
Phenanthrene	ND – 4,900	100	12 of 62	500	11 of 62
Pyrene	ND – 2,100	500	11 of 62	500	11 of 62
Total PAHs	ND – 23,850	no criterion		500	13 of 62
Inorganics					
Arsenic	2.1 – 80.8	13	13 of 28	16	10 of 28

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use, unless otherwise noted.

Metals contamination in soil is associated with historic fill activity at the site. Disposal of ash, and coal has resulted in inorganic soil contamination above the unrestricted SCGs. However, the inorganic concentrations are consistent with the background samples collected in the immediate area of the site and are not associated with the tar/asphalt constituents. Therefore, metals contamination is not considered a site specific contaminant of concern.

Based on the findings of the Remedial Investigation, the presence of coal tar byproducts and/or asphalt has resulted in the contamination of soil. The site contaminants identified in soil which

are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are PAHs.

Exhibit B

Description of Remedial Alternatives

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Alternative 2: Hudson Riverbank and upland surface asphalt/tar removal, Institutional Controls

Alternative 2 includes the removal of surficial asphalt/tar deposits, purifier material and associated soil on the Hudson riverbank to a depth of one foot. The asphalt/tar and associated soil would be removed with long-reach excavators from the upland portion of the site. This alternative includes the removal of residual surficial asphalt/tar that has been observed across the upland plateau area to a depth of one-foot. Together, approximately 800 cubic yards would be removed. The asphalt/tar and associated soil would be transported for appropriate off-site disposal. Excavated areas would be restored to the existing grade with soil satisfying commercial use SCOs. Riverbank backfill would also satisfy protection of ecological resources SCOs. Excavated areas along the riverbank would be restored to 6 NYCRR Part 608 requirements including any necessary stabilization. This alternative includes site management elements, including maintenance of the existing perimeter fencing, the establishment of an environmental easement prohibiting the use of the site for purposes other than commercial use, and prohibiting groundwater use. Remedial construction of Alternative 2 would take approximately 6 months to complete.

Present Worth: .....$1.56 million
Capital Cost:.....$1.18 million
Annual Costs:.....$10,000.

Alternative 3 Hudson Riverbank and upland surface asphalt/tar removal, Site Cover, Institutional Controls

Alternative 3 includes of all of the elements of Alternative 2 with the addition of a site cover in the upland area where soil exceeds the SCOs for commercial use in the top one-foot and backfill of the streambank with soil that satisfies the protection of ecological resources SCOs. Based on the available data, for the upland area removal of the surface tar followed by backfill with soil that satisfies the SCOs for commercial use would satisfy the requirements for a site cover. The site cover would be one-foot thick and extend for approximately 31,000 square feet. Remedial construction of Alternative 3 would take approximately 9 months to complete.

Present Worth: .....$1.82 million
Capital Cost:.....$1.39 million
Annual Costs:.....$10,000.

Alternative 4: Hudson Riverbank and upland surface asphalt/tar removal, Removal of soil containing visual asphalt/tar or total PAHs greater than 500 ppm, Soil Cover, Institutional Controls

Alternative 4 includes of all of the elements of Alternative 2 with the addition of the removal of soil containing asphalt/tar or total PAHs greater than 500 ppm to a depth of 15 feet. The removal areas are depicted in Figure 4. In addition, a one-foot thick soil cover over soil containing contaminant levels greater than the commercial SCOs within one-foot of the surface would be placed. In addition to Alternative 2, Alternative 3 would remove approximately 3,975 cubic yards of subsurface soil and asphalt/tar. Backfill material for the removal area and the site cover would satisfy the protection of commercial use SCOs. Remedial construction of Alternative 4 would take approximately 10 months to complete.

Present Worth: .....$6.42 million
Capital Cost:.....$5.23 million
Annual Costs:.....$10,000.

Alternative 5: Restoration to Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). Alternative 5 includes the removal of all on-site soil with concentrations of contaminants above unrestricted use SCOs. Approximately 44,000 cubic yards of soil would be removed to a depth of 38 feet. Shoring and dewatering of the excavation would be implemented as needed. Removed soil would be disposed off-site. Soil meeting the requirements for unrestricted use would be used to backfill the excavation. The removal of soil exceeding the unrestricted SCOs would encroach the Route 378 bridge pier, possibly resulting in additional construction cost in order to maintain the structural integrity of the bridge. Remedial construction of Alternative 5 would take approximately 2 years to complete.

Capital Cost:.....$35 million

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
No Action	0	0	0
Alternative 2: Hudson Riverbank and upland surface asphalt/tar removal, Institutional Controls	1.18 million	10,000.	1.56 million
Alternative 3 Hudson Riverbank and upland surface asphalt/tar removal, Soil Cover, Institutional Controls	1.39 million	10,000.	1.82 million
Alternative 4: Hudson Riverbank and upland surface asphalt/tar removal, Removal of soil containing visual asphalt/tar or total PAHs greater than 500 ppm, Soil Cover, Institutional Controls	5.23 million	10,000.	6.42 million
Alternative 5: Restoration to Unrestricted Conditions	$35 million	0	$35 million

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 3 **Hudson Riverbank and upland surface asphalt/tar removal, Soil Cover, Institutional Controls** as the remedy for this site. Alternative 3 would achieve the remediation goals for the site by removing tar/asphalt at the surface of the site while providing a site cover as well as the establishment and implementation of institutional and engineering controls which include a site management plan and periodic certification to determine the effectiveness of the remedy. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 5.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the Feasibility Study.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

The proposed remedy (Alternative 3) would satisfy this criterion by eliminating the potential for human and wildlife exposures to the tar/asphalt that is currently on the surface. The land use restriction and Site Management Plan will reduce or remove the potential for exposure to tar/asphalt and PAHs in the subsurface soil. Impacts to groundwater are minor and are addressed by restricting groundwater use through an institutional control.

Alternative 1 (No Action) does not provide any protection to public health and the environment and will not be evaluated further. Alternative 2 is not as protective as the proposed remedy because the lack of a site cover does not ensure isolation to potential human and wildlife exposures to contaminants under the surface. Alternatives 4 and 5, by providing additional impacted soil removal along with the remedy components of the proposed alternative, are also protective of human health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The proposed remedy, Alternative 3, complies with SCGs to the extent practicable. It addresses concentrated wastes to the extent practicable and complies with the restricted use soil cleanup objectives at the surface through construction of a cover system. Alternative 2 also complies with this criterion but with lower certainty due to the absence of a site cover system. Alternatives 4 and 5 satisfy compliance to SCGs to a greater degree than the proposed alternative because alternatives

4 and 5 remove additional soil from the site containing PAHs exceeding the SCGs. Because Alternatives 2 through 5 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

Long-term effectiveness is best accomplished by those alternatives involving excavation of the contaminated overburden soils (Alternatives 4 and 5). Thus, Alternative 5, by removing 44,000 cy of soil, would be the most effective remedy in the long-term, followed by Alternative 4. In Alternative 4, the bulk of approximately 4,000 cubic yards of soil exceeding the commercial use SCOs is in the 9 to 13-foot depth range, overlain with less-contaminated soil. Thus, a substantial volume of soil would require excavation and stockpiling in order to access the soil targeted for removal. Alternative 3 would be more effective than Alternative 2 in the long-term, since the Site Management Plan would require continued integrity of the site cover under Alternative 3.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternatives 4 and 5 remove more impacted soil from the site as compared to Alternatives 2 and 3 and thus would reduce more volume of impacted soil as compared to Alternatives 2 and 3. While Alternative 5 removes substantially greater volume than Alternative 4 to achieve an unrestricted use, Alternative 5 removes only a marginally greater contaminant mass than Alternative 4. Alternatives 2 and 3 provide similar reduction in toxicity, mobility and volume. Although the tar/asphalt has been observed to be viscous or hard with an insignificant impact on groundwater, its removal identified in Alternatives 2 thru 5 will provide a reduction in toxicity and mobility at the site in addition to volume reduction.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternatives 2 through 4 all have short-term adverse impacts which could easily be controlled. Alternative 4 would have a greater short-term impact as compared to Alternatives 2 and 3 because the additional removal of approximately 4,000 cubic yards of soil and importation of backfill will contribute to additional truck traffic and a longer construction duration. Alternative 5 has the greatest short-term impact due to the substantial truck traffic needed to remove and import approximately 44,000 cubic yards of soil. Alternative 5 may also potentially require a disruption of the natural gas main that traverses the site and a disruption to traffic on Route 378

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

Alternatives 2 and 3 are favorable in that they are readily implementable. Alternative 4 is also implementable, but the volume of soil excavated under this alternative would necessitate increased truck traffic on local roads. Alternative 4 would also require an evaluation of shoring for the soil removal. Alternative 5 is the most difficult to implement as it would require substantial shoring and dewatering systems in order to remove soil adjacent to the Hudson River to a depth of 38 feet. Removal of soil proximate to the bridge pier while maintaining the integrity of the bridge will be substantially more difficult to implement as compare to the soil removal of Alternative 4.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

Cost effectiveness is the cost of the remedy in comparison to its benefit. The costs of the alternatives vary significantly. Alternatives 2 and 3 are similar in cost, being within 10% of each other. Alternative 3 provides a greater cost effectiveness as compared to Alternative 2 because of the benefit gained through a permanent site cover. Alternative 4 is approximately four times greater in cost as compared to Alternative 2 and proposed Alternative 3. While Alternative 4 provides the benefit of additional impacted soil removal as compared to Alternatives 2 and 3, the impacted soil requires the removal of relatively cleaner overlying soil. Also, since the subsurface soil impacts are not contributing to substantial groundwater contamination at this site, its removal is of marginal benefit. Alternative 5 is approximately 6 times greater in cost than Alternative 4. The benefit of removing marginally contaminated soil to a depth of 38 feet to achieve an unrestricted use is not at par with the cost of removal. Alternative 5 is not cost effective.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

Alternative 5, the cleanup to unrestricted use, is determined to be infeasible. As described above, Alternative 5 has significant short-term impacts, is challenging to implement, and is not cost effective. The site is currently zoned industrial. However, given its waterfront location the site has the potential of being a passive recreational or commercial use area in the future. Also, at this site, the presence of PAHs, and benzo(a)pyrene in particular, play a significant role in determining the extent of remediation. Because of a nearly identical SCO for benzo(a)pyrene for commercial use versus industrial use (commercial SCO: 1 ppm; industrial SCO 1.1 ppm) the difference in cleanup levels between commercial and industrial is marginal. The Department may also approve a

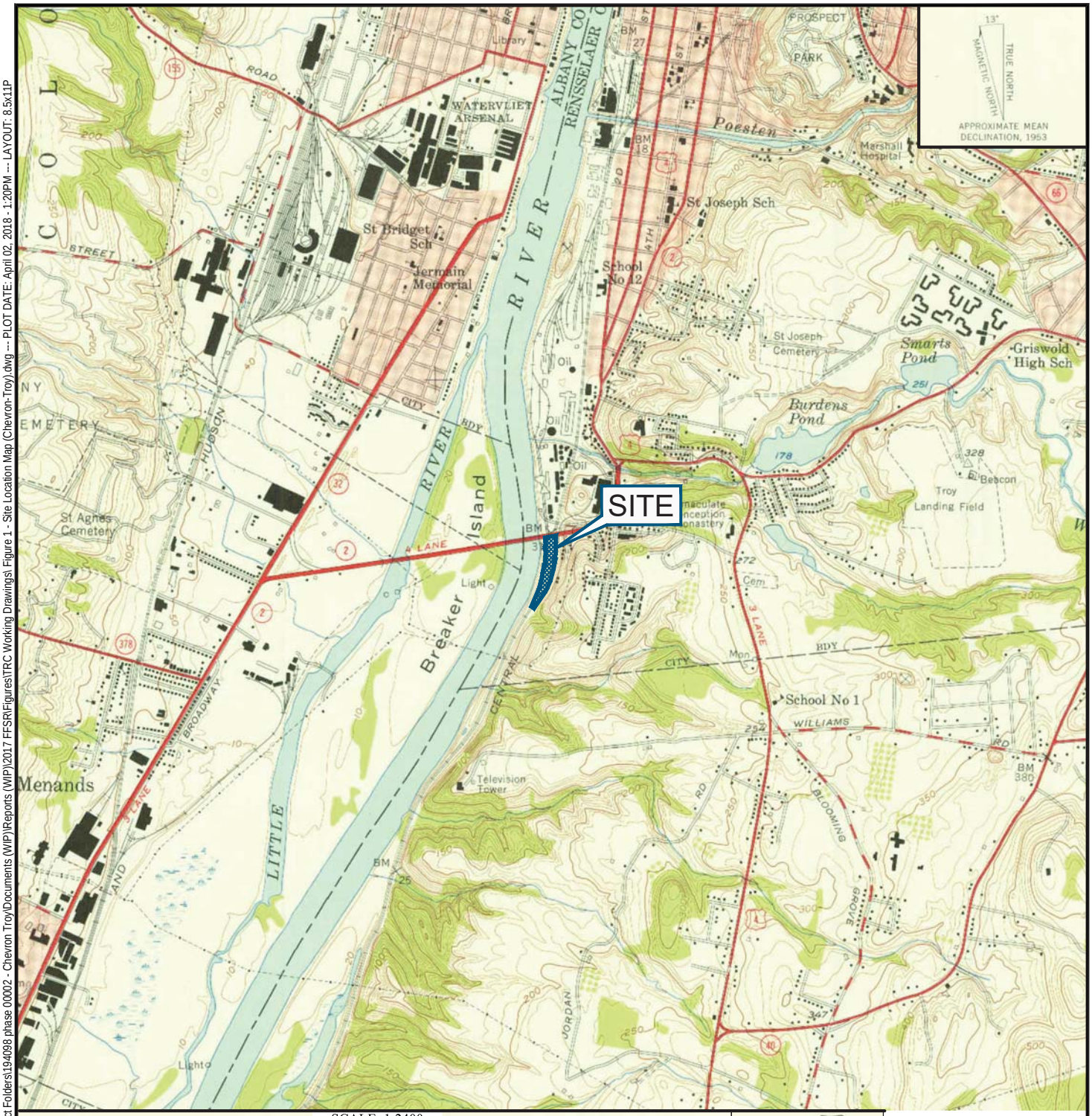
remedial program for a soil that achieves a cleanup which is more stringent than the current use of the site.

Alternative 4 provides a more desirable cleanup to a commercial use as compared to Alternatives 2 and 3 because it removes subsurface impacts at the time of remediation. Subsurface impacts will be removed under Alternatives 2 and 3 at the time of future excavation, in accordance with the site management plan. Alternative 3 provides a more desirable cleanup to a commercial use as compared to Alternative 2 through the provision of a site cover.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Alternative 3 is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.



SCALE: 1:2400

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

CONTOUR INTERVAL 10 FEET

QUADRANGLE LOCATION

MAP INCLUDES INFORMATION FROM THE FOLLOWING MAP SHEET(S):
TP, TROY SOUTH, NY, 7.5-MINUTE DATED 1953

TRC
41 Spring Street
New Providence, NJ 07974
Phone: 908.988.1700
www.trcsolutions.com

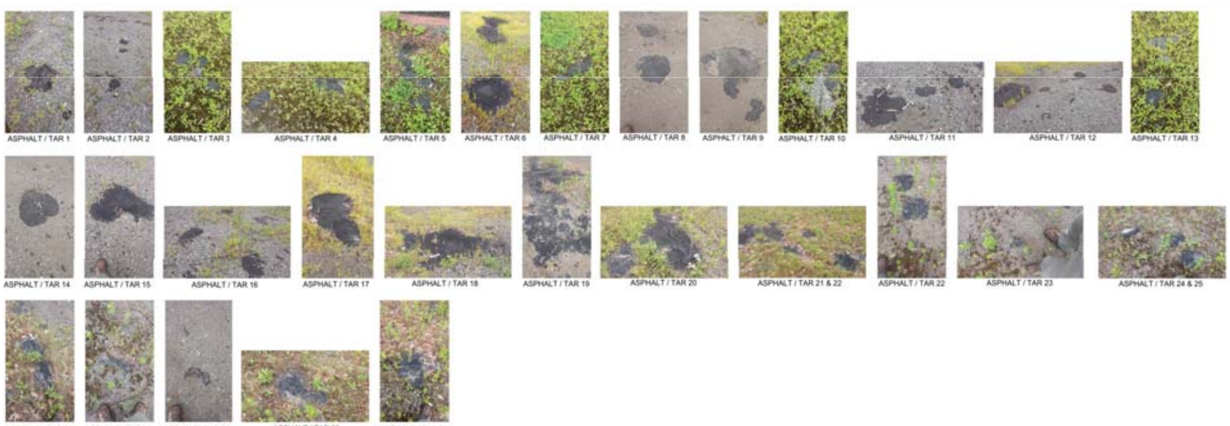
PROJECT:
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
CHEVRON ASPHALT TERMINAL
TROY, NY 12832

TITLE:

SITE LOCATION MAP

DRAWN BY:	H. DELGADO
CHECKED BY:	J. MIRANDA
APPROVED BY:	K. ROBBINS
DATE:	APRIL 2018
PROJ. NO.:	261155.0003.0000
FILE:	Figure 1 - Site Location Map (Chevron-Troy).dwg

FIGURE 1



ASPHALT / TAR 1 · ASPHALT / TAR 2 · ASPHALT / TAR 3 · ASPHALT / TAR 4 · ASPHALT / TAR 5 · ASPHALT / TAR 6 · ASPHALT / TAR 7 · ASPHALT / TAR 8 · ASPHALT / TAR 9 · ASPHALT / TAR 10 · ASPHALT / TAR 11 · ASPHALT / TAR 12 · ASPHALT / TAR 13

ASPHALT / TAR 14 · ASPHALT / TAR 15 · ASPHALT / TAR 16 · ASPHALT / TAR 17 · ASPHALT / TAR 18 · ASPHALT / TAR 19 · ASPHALT / TAR 20 · ASPHALT / TAR 21 & 22 · ASPHALT / TAR 22 · ASPHALT / TAR 23 · ASPHALT / TAR 24 & 25

ASPHALT / TAR 26 · ASPHALT / TAR 27 · ASPHALT / TAR 28 · ASPHALT / TAR 29 · ASPHALT / TAR 30

LEGEND (SYMBOLS NOT TO SCALE):

- SITE BOUNDARY (UPLAND PLATEAU)
- PLATEAU SURFICIAL ASPHALT / TAR LOCATIONS
- LOCATION AND EXTENT OF SURFICIAL ASPHALT / TAR REMOVAL RIVER BANK AREA

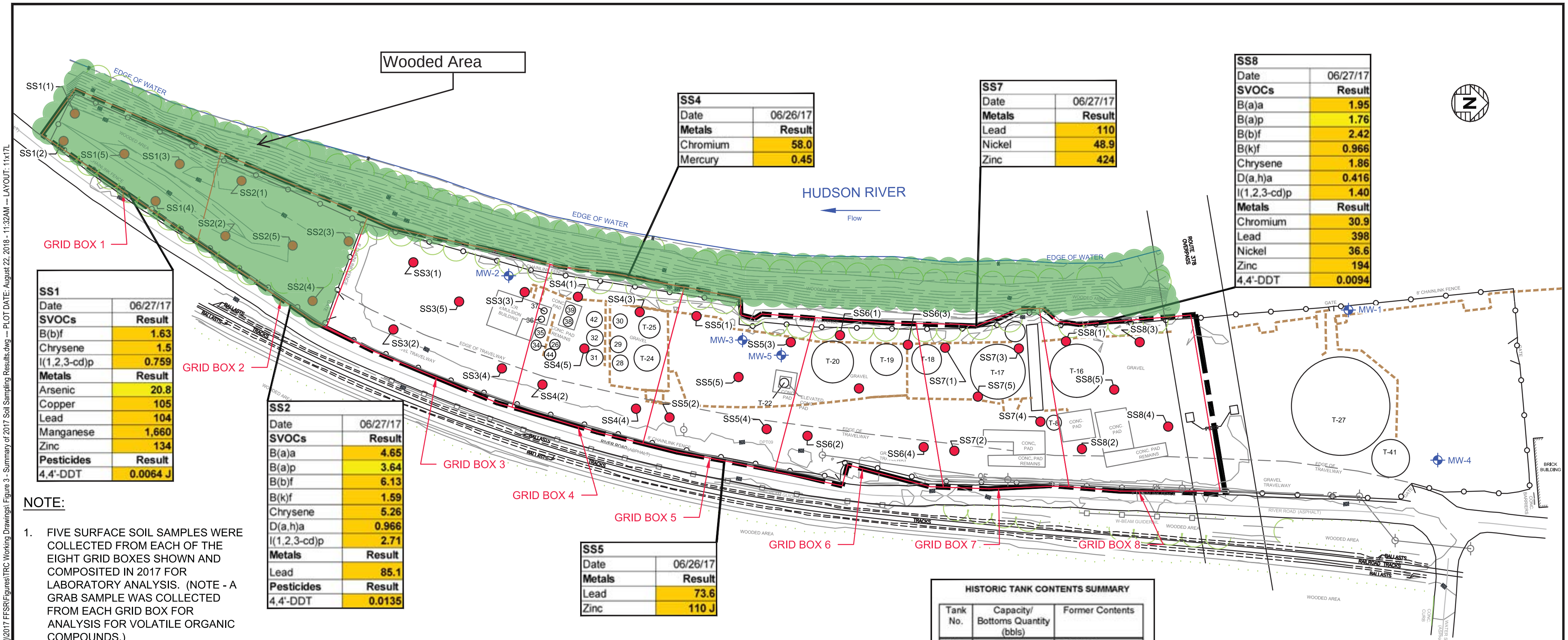
0 60' 120'
SCALE: 1"=60'
SHEET SIZE: 22' BY 34"

PROJECT: CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
CHEVRON ASPHALT TERMINAL
TROY, NEW YORK 12832

TITLE: LOCATIONS OF RESIDUAL SURFICIAL ASPHALT / TAR ON UPLAND PLATEAU

DRAWN BY:	H. DELGADO	PROJ. NO.:	261155.0003.0000
CHECKED BY:	L. O'HARA	FIGURE 2	
APPROVED BY:	K. ROBBINS		
DATE:	MARCH 2018		

22x34 --- USER: MDelCiello --- ATTACHED XREFS: --- ATTACHED IMAGES: overlay-1;
DRAWING NAME: \\NEWPROV-FP1\Environmental\Office Files\Vision Project Folders\194098 phase 00002 - Chevron Troy\Documents (WIP)\Reports (WIP)\2017 FFSR\Appendices\App B - 2017 Results\Figures\ TRC Working Drawings.dwg --- PLOT DATE: September 05, 2018 - 3:09PM --- LAYOUT: 22X34L
Version: 2017-10-21



SS1	
Date	06/27/17
SVOCs	**Result**
B(b)f	**1.63**
Chrysene	**1.5**
I(1,2,3-cd)p	**0.759**
Metals	**Result**
Arsenic	**20.8**
Copper	**105**
Lead	**104**
Manganese	**1,660**
Zinc	**134**
Pesticides	**Result**
4,4'-DDT	**0.0064 J**

SS2	
Date	06/27/17
SVOCs	**Result**
B(a)a	**4.65**
B(a)p	**3.64**
B(b)f	**6.13**
B(k)f	**1.59**
Chrysene	**5.26**
D(a,h)a	**0.966**
I(1,2,3-cd)p	**2.71**
Metals	**Result**
Lead	**85.1**
Pesticides	**Result**
4,4'-DDT	**0.0135**

SS4	
Date	06/26/17
Metals	**Result**
Chromium	**58.0**
Mercury	**0.45**

SS5	
Date	06/26/17
Metals	**Result**
Lead	**73.6**
Zinc	**110 J**

SS7	
Date	06/27/17
Metals	**Result**
Lead	**110**
Nickel	**48.9**
Zinc	**424**

SS8	
Date	06/27/17
SVOCs	**Result**
B(a)a	**1.95**
B(a)p	**1.76**
B(b)f	**2.42**
B(k)f	**0.966**
Chrysene	**1.86**
D(a,h)a	**0.416**
I(1,2,3-cd)p	**1.40**
Metals	**Result**
Chromium	**30.9**
Lead	**398**
Nickel	**36.6**
Zinc	**194**
4,4'-DDT	**0.0094**

NOTE:

1. FIVE SURFACE SOIL SAMPLES WERE COLLECTED FROM EACH OF THE EIGHT GRID BOXES SHOWN AND COMPOSITED IN 2017 FOR LABORATORY ANALYSIS. (NOTE - A GRAB SAMPLE WAS COLLECTED FROM EACH GRID BOX FOR ANALYSIS FOR VOLATILE ORGANIC COMPOUNDS.)

LEGEND (SYMBOLS NOT TO SCALE):

- SITE BOUNDARY (UPLAND PLATEAU)
- -10- SURFACE ELEVATION CONTOUR (IN FEET)
- OE UTILITY POLE WITH OVERHEAD ELECTRIC
- EDGE OF WOODS
- CHAINLINK FENCE
- EDGE OF WATER
- T-24 FORMER ABOVE-GROUND STORAGE TANK
- FORMER ABOVE-GROUND PIPING
- MW-X EXISTING MONITORING WELL
- SSX(X) SOIL SAMPLING LOCATION (2017)

Parameters (mg/kg)	Unrestricted Use SCO	Industrial Use SCO
SVOCs		
B(a)a = Benzo(a)anthracene	1	11
B(a)p = Benzo(a)pyrene	1	1.1
B(b)f = Benzo(b)fluoranthene	1	11
B(k)f = Benzo(k)flouranthene	0.8	110
Chrysene	1	110
D(a,h)a = Dibenzo(a,h)anthracene	0.33	1.1
I(1,2,3-cd)p = Indeno(1,2,3-cd)pyrene	0.5	11
Metals		
Arsenic	13	16
Chromium	30	6,800
Copper	50	10,000
Lead	63	3,900
Manganese	1,600	10,000
Mercury	0.18	5.7
Nickel	30	10,000
Zinc	109	10,000
Pesticides		
4,4'-DDT	0.0033	94

SCO - SOIL CLEANUP OBJECTIVE (6 NYCRR PART 375).
ALL RESULTS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)
ONLY RESULTS ABOVE REGULATORY CRITERIA ARE SHOWN.
BOLD AND GOLD HIGHLIGHT INDICATES EXCEEDANCE ABOVE UNRESTRICTED USE SCO
BOLD AND YELLOW HIGHLIGHT INDICATES EXCEEDANCE ABOVE INDUSTRIAL USE SCO
J - ESTIMATED VALUE

HISTORIC TANK CONTENTS SUMMARY

Tank No.	Capacity/ Bottoms Quantity (bbls)	Former Contents
T-8	1,000	Unknown
T-16	15,000	Asphalt
T-17	15,000	Emulsion Base
T-18	5,000	AC-20 (Asphalt)
T-19	5,000	Asphalt
T-20	10,000	Emulsion Base
22	6,000	Naptha
T-24	2,500	MS-2 (Asphalt)
T-25	1,000	RS-2 (Asphalt)
26	250	Other
T-27	50,000	Asphalt
28	1,000	Emulsion
29	1,000	Asphalt emulsion
30	500	Emulsion
31	1,000	Emulsion
32	1,000	Emulsion
33	100	Caustic
34	120	Raw material
35	120	Raw material
36	100	Treated water
37	100	Treated water
38	120	Raw materials
39	120	Asphalt Recovery
40	1,000	Asphalt
T-41	5,000	Asphalt
42	1,000	MS-2 (Asphalt)
43	47	Additive for asphalt
44	153	Raw material
45	75	Acid

Notes:
-There is no available information regarding the former contents of tank T-8

SOURCES:

BASE MAP PREPARED FROM A FIELD SURVEY CONDUCTED BY M.J. ENGINEERING AND LAND SURVEYING, P.C. MAY 2013. FORMER ABOVE-GROUND STORAGE TANK LOCATIONS FROM HISTORICAL CHEVRON DRAWINGS.

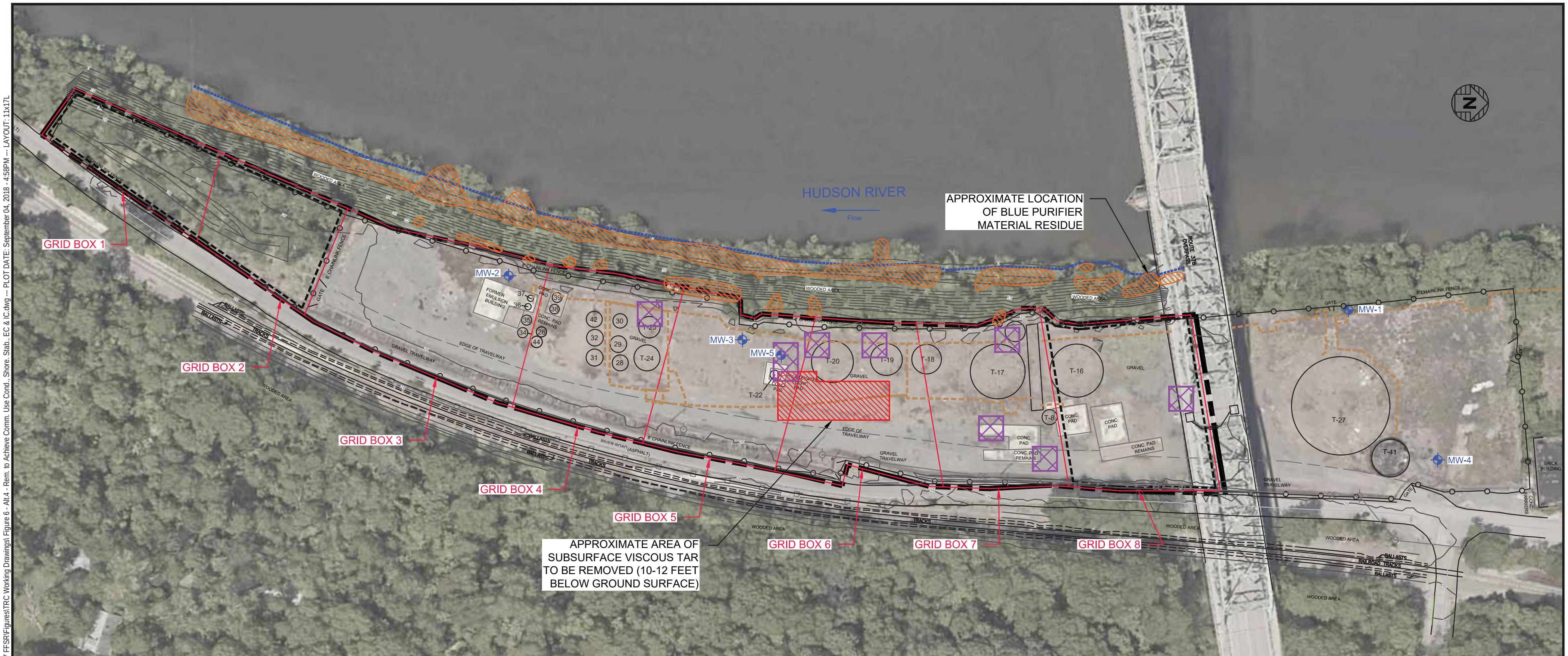
0 100' 200'
SCALE: 1"=100'
SHEET SIZE: 11' BY 17"

PROJECT:
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
CHEVRON ASPHALT TERMINAL
TROY, NY 12832

TITLE:
SUMMARY OF 2017 SOIL SAMPLING RESULTS

DRAWN BY:	H. DELGADO	PROJ NO.:	261155.0003.0000
CHECKED BY:	J. MIRANDA		
APPROVED BY:	K. ROBBINS	**FIGURE 3**	
DATE:	AUGUST 2018		

DRAWING NAME: Y:\Office Files\Vision Project Folders\194099 phase 00002 - Chevron Troy\Documents (WIP)\Reports (WIP)\2017 FFSR\Figures\TRC Working Drawings\ Figure 3 - Summary of 2017 Soil Sampling Results.dwg — PLOT DATE: August 22, 2018 - 11:32AM — LAYOUT: 11x17L
Version: 2017-10-21



LEGEND (SYMBOLS NOT TO SCALE):

- SITE BOUNDARY (UPLAND PLATEAU)
- SURFACE ELEVATION CONTOUR (IN FEET)
- UTILITY POLE WITH OVERHEAD ELECTRIC
- CHAINLINK FENCE
- FORMER ABOVE-GROUND STORAGE TANK
- FORMER ABOVE-GROUND PIPING
- EXISTING MONITORING WELL
- LOCATION AND EXTENT OF SURFICIAL ASPHALT / TAR RIVER BANK AREA
- APPROXIMATE AREA OF PROPOSED SHORELINE STABILIZING MATERIALS
- APPROXIMATE LIMITS OF AREA PROPOSED FOR COVER
- SUB-SURFACE SOIL WITH TOTAL POLYCYCLIC AROMATIC HYDROCARBONS ABOVE 500 PARTS PER MILLION (TO BE REMOVED)

NOTE:

1. ALTHOUGH NOT SHOWN ON THIS FIGURE, LIMITED SURFACE SOIL REMOVAL WOULD BE PERFORMED IN GRID BOXES 3 THROUGH 8 (UPLAND PLATEAU) IN AREAS OF RESIDUAL SURFICIAL ASPHALT / TAR IMPACTS. REFER TO APPENDIX A FOR THE LOCATIONS OF SURFICIAL ASPHALT / TAR.

SOURCES:

BASE MAP PREPARED FROM A FIELD SURVEY CONDUCTED BY M.J. ENGINEERING AND LAND SURVEYING, P.C. MAY 2013.
FORMER ABOVE-GROUND STORAGE TANK LOCATIONS FROM HISTORICAL CHEVRON DRAWINGS.

0 100' 200'
SCALE: 1"=100'
SHEET SIZE: 11' BY 17"

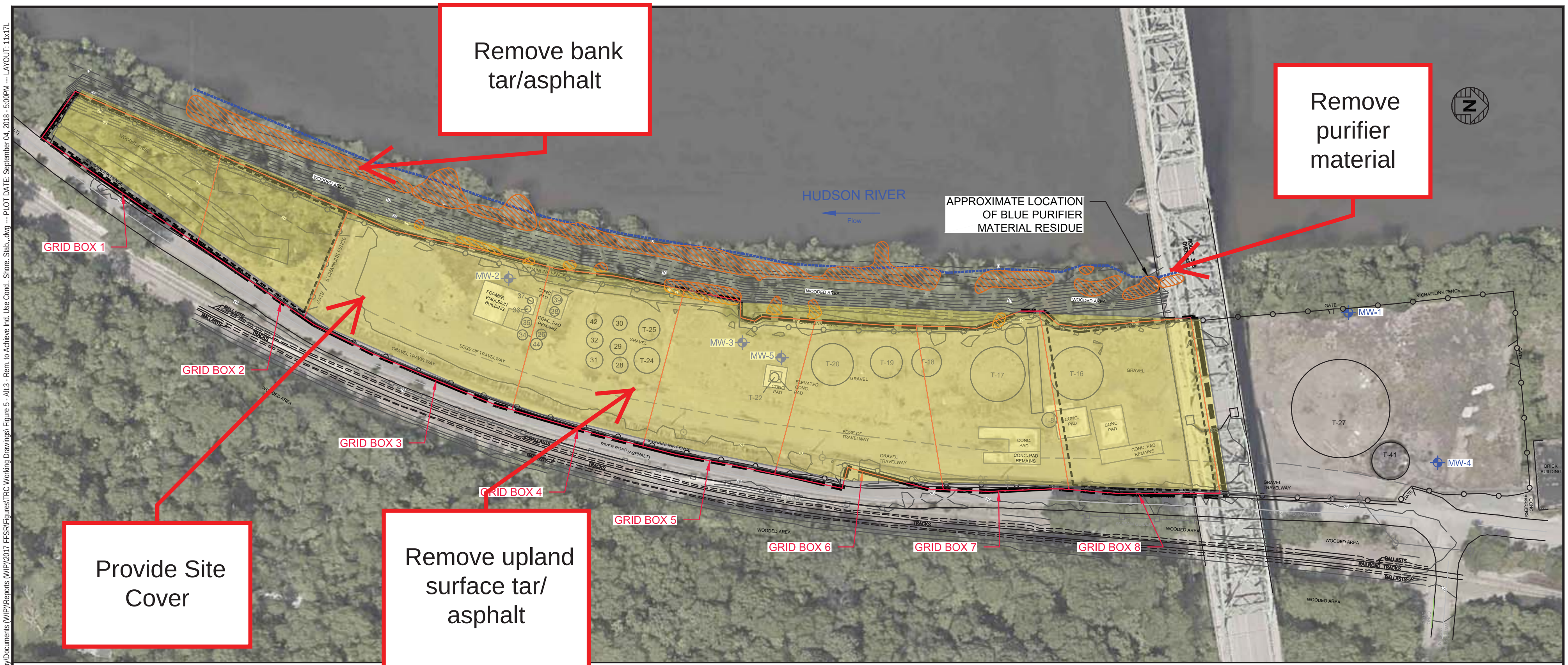
PROJECT:
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
CHEVRON ASPHALT TERMINAL
TROY, NY 12832

Alternative 4: Riverbank and Upland Surface asphalt/tar removal, Removal of Soil Containing Visual Asphalt/Tar or Total PAHs Greater than 500 ppm, Soil Cover, Institutional Controls

Figure 4

DRAWING NAME: W:\Vision Project Folders\194098 phase 00002 - Chevron Troy\Documents (WIP)\Reports (WIP)\2017 FFS\Figures\TRC Working Drawings\ Figure 6 - Alt.4 - Rem. to Achieve Comm. Use Cond., Shore. Stab., EC & IC.dwg --- PLOT DATE: September 04, 2018 - 4:58PM --- LAYOUT: 11x17L

Version: 2017-10-21



LEGEND (SYMBOLS NOT TO SCALE):

	SITE BOUNDARY (UPLAND PLATEAU)
-10-	SURFACE ELEVATION CONTOUR (IN FEET)
OE	UTILITY POLE WITH OVERHEAD ELECTRIC
	CHAINLINK FENCE
T–24	FORMER ABOVE-GROUND STORAGE TANK
MW-X	EXISTING MONITORING WELL
	LOCATION AND EXTENT OF SURFICIAL ASPHALT / TAR RIVER BANK AREA
	APPROXIMATE AREA OF PROPOSED SHORELINE STABILIZING MATERIALS
	APPROXIMATE LIMITS OF AREA PROPOSED FOR COVER

0 100' 200'

SCALE: 1"=100'
SHEET SIZE: 11' BY 17"

PROJECT:
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
CHEVRON ASPHALT TERMINAL
TROY, NY 12832

Proposed Remedy
Figure 5

(see narrative for a complete description)

Version: 2017-10-21