NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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December 5, 2017

Mr. Paul Neureuter
Elk Street Commerce Park, LLC/The Krog Group
4 Centre Drive
Orchard Park, New York 14127

RE: ExxonMobil Former Buffalo Refinery OU-2 East Site
Site ID No. C915201B, City of Buffalo, Erie County
Remedial Alternative Analysis and Decision Document

Dear Mr. Neureuter:

The New York State Department of Environmental Conservation (Department) and the New York State Department of Health (NYSDOH) have reviewed the Remedial Investigation – Alternative Analysis Report (RI-AAR) for the ExxonMobil Former Buffalo Refinery OU-2 East Site dated November 2016. The RI-AAR is hereby approved. Please ensure that a copy of the approved RI-AAR is placed in the document repository.

Enclosed is a copy of the Department's Decision Document for the site. The remedy is to be implemented in accordance with this Decision Document. Please ensure that a copy of the Decision Document is placed in the document repository.

Please contact the Department's Project Manager, Eugene Melnyk, P.E., at 716-851-7220 or eugene.melnyk@dec.ny.gov at your earliest convenience to discuss next steps. Please recall the Department requires seven (7) days' notice prior to the start of field work.

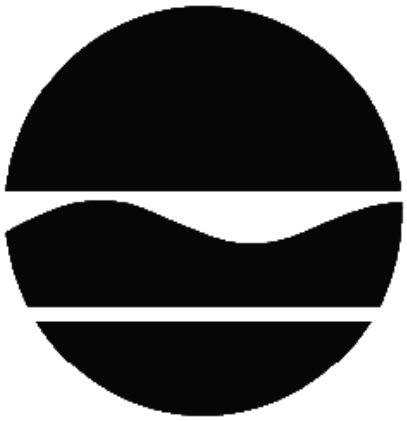
Sincerely,

Michael J. Cruden, P.E.
Director
Remedial Bureau E
Division of Environmental Remediation

Enclosure
ec: M. Ryan - NYSDEC
C. Staniszewski – Region 9
E. Melnyk – Region 9
J. Dougherty – Region 9
K. Anders – NYSDOH
C. Bethoney - NYSDOH
R. Jones - NYSDOH
E. Zinkewicz – ExxonMobil Environmental Services
P. Pontoriero – Amec/Foster Wheeler PC

DECISION DOCUMENT

ExxonMobil Oil Former Buffalo Terminal OU-2 East
Brownfield Cleanup Program
Buffalo, Erie County
Site No. C915201B
November 2017



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

DECLARATION STATEMENT - DECISION DOCUMENT

ExxonMobil Oil Former Buffalo Terminal OU-2 East
Brownfield Cleanup Program
Buffalo, Erie County
Site No. C915201B
November 2017

Statement of Purpose and Basis

This document presents the remedy for the ExxonMobil Oil Former Buffalo Terminal OU-2 East site, a brownfield cleanup site. The remedial program was chosen in accordance with the 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 decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the ExxonMobil Oil Former Buffalo Terminal OU-2 East site and the public's input to the proposed remedy presented by the Department.

Description of Selected Remedy

The elements of the selected remedy are as follows:

1. REMEDIAL DESIGN

A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remediation 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 gas 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. REMOVAL OF STRUCTURES

The soil stabilization remedial element described below will require the removal of an abandoned and covered concrete tank as well as process structure foundations, floor slabs and removal any remaining process piping encountered during the execution of the stabilization task. An estimated 15,000 cubic yards of concrete will be removed from the subsurface to allow for in situ stabilization/treatment of soils. The concrete will be processed on-site and placed below the one-foot cover or used as road base and installed beneath permanent pavement. An estimated 1,500 lineal feet (lf) of process piping is anticipated to be encountered during concrete removal or in situ stabilization/treatment activities. The pipe will be removed from the subsurface, drained of contents and removed from the site for either proper disposal or recycling

3. IN-SITU STABILIZATION

In-situ stabilization (ISS) will be implemented on all grossly contaminated soils, as defined in 6 NYCRR Part 375 1.2(u), and all characteristically hazardous lead soil/fill across the site with the exception of soils covered by pavement or buildings in the immediate vicinity of the actively used Buckeye Terminal buildings located at the south eastern portion of the site. These soils will be further assessed and remediated if/when the buildings and/or pavement are removed. Grossly contaminated soil is prevalent throughout the ExxonMobil and Buckeye Terminal properties on OU-2 East. Hazardous lead soils are situated in the eastern portion of OU-2 East. Hazardous lead soils will be stabilized throughout their depth. The depth of stabilization for grossly contaminated soil will vary across the site including:

- to the depth of the underlying clay confining layer;
- to the depth of the water table; or
- five feet below ground surface.

The contaminated soil will be mixed in place with stabilizing agents using an excavator or augers. The stabilized soil will then be covered with a cover system as described in element 5 to prevent direct exposure. This treatment changes the contamination from a soluble form to a stable, insoluble compound to reduce or eliminate the matrix as a source of groundwater contamination. For grossly contaminated soils the treatment will also remove/reduce the gross characteristics of the soil (i.e., odors, sheen, photoionization detector readings, etc.).

In-situ treatment of grossly impacted soils: Approximately 204,000 cubic yards of grossly contaminated soil will be stabilized. In areas where existing data indicates that soils are impacted below five feet the depth of treatment will extend to the clay surface or to the water table whichever is shallower. Pilot scale testing will be conducted to assess the appropriate soil amendment such as Portland cement or lime kiln dust. Some petroleum impacted soils below paved areas and under, or immediately adjacent to, buildings may be left in place, provided that the pavement is competent.

In situ stabilization of lead impacted soils: Approximately 12,000 cubic yards of lead impacted soil will be stabilized. Lead impacted soils will be stabilized by amending the soils with Portland cement or other chemical fixation treatments. The impacted soils will be stabilized from ground surface to the underlying clay stratum. During implementation of the remedy, samples of the stabilized soils will be analyzed for leachable lead.

4. HYDRAULIC CONTROL

Hydraulic control of groundwater to minimize groundwater migration from off-site areas onto the site will be provided by extending the soil stabilization into the lacustrine clay along the up-gradient areas of the site. The depth to clay is greater than 5 feet at localized areas along Elk Street, along the eastern border of OU-2 East and areas adjacent to Babcock Street on the western side of the site. In these areas, the depth of soil stabilization will be increased until the lacustrine clay is encountered. The minimum width of the deepened section will be approximately three feet wide. Additional soil stabilization for hydraulic control to limit groundwater flow onto OU-3 (BCP Site C915201D) will include the depth of treatment extended to the lacustrine clay layer along the border between OU-2 East and OU-3. Stabilized soils will achieve a maximum hydraulic conductivity of $1x10^{-6}$ cm/sec.

5. COVER SYSTEM

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) and over stabilized/treated soil. 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. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

6. INSTITUTIONAL CONTROLS

Imposition of an institutional control in the form of an environmental easement will be required. The remedy will achieve a Track 4 commercial cleanup at a minimum and will include an environmental easement and site management plan as described below.

Institutional Control

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

- requires 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 and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts 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
- requires compliance with the Department approved Site Management Plan.

7. SITE MANAGEMENT PLAN

A Site Management Plan, which includes the following:

a. 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 6 above.

Engineering Controls: The site cover discussed in Paragraph 5.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures which will remain are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department determination of the need for a remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for the site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment. This includes grossly impacted soil and former refinery piping that may be located beneath or in the immediate vicinity or the two large buildings located on Buckeye Terminal property at the south east portion of the site.
- a provision for evaluation of the potential for soil vapor intrusion for any current or new buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- a provision that should an existing or future building or building foundation be demolished in the future, a cover system consistent with that described in Paragraph 5 above will be placed in any areas where the upper one foot of exposed surface soil exceed the applicable SCOs;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- 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:
   - monitoring of groundwater to assess the performance and effectiveness of the remedy; and
   - a schedule of monitoring and frequency of submittals to the Department.
   - monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

Declaration

The remedy conforms with promulgated standards and criteria that are directly applicable, or that are relevant and appropriate and takes into consideration Department guidance, as appropriate. The remedy is protective of public health and the environment.

Michael J Cruden

Digitally signed by Michael J Cruden
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Date

Michael Cruden, Director
Remedial Bureau E

DECISION DOCUMENT

ExxonMobil Oil Former Buffalo Terminal OU-2 East
Buffalo, Erie County
Site No. C915201B
November 2017

SECTION 1: SUMMARY AND PURPOSE

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of contaminants at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of contaminants at this site, as more fully described in this document, has contaminated various environmental media. Contaminants include hazardous waste and/or petroleum.

The New York State Brownfield Cleanup Program (BCP) is a voluntary program. The goal of the BCP is to enhance private-sector cleanups of brownfields and to reduce development pressure on "greenfields." A brownfield site is real property, the redevelopment or reuse of which may be complicated by the presence or potential presence of a contaminant.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and 6 NYCRR Part 375. This document is a summary of the information that can be found in the site-related reports and documents.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repository:

Buffalo and Erie County Public Library
1 Lafayette Square
Buffalo, NY 14203
Phone: 716-858-8900

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 ExxonMobil Oil Former Buffalo Terminal OU-2 East site is located in an urban area on the south side of Elk Street in the City of Buffalo. The site is bordered on the west by Babcock Street and on the south by Prenatt Street (a paper street). The site is situated just north of the Buffalo River.

Site Features:
The site is 33.5 acres in size with relatively flat topography. The site consists mainly of open vacant field with the southeastern portion developed with several commercial buildings and roadways supporting Buckeye petroleum storage and distribution terminal operations. This site is located within the footprint of a larger former petroleum refining facility. The larger former refinery and storage facility (previously defined as BCP site C915201) was segregated into five smaller individual BCP sites for remediation and redevelopment purposes. The five BCP sites include: OU-1 (BCP Site 915201), OU-2 West (BCP Site 915201C), OU-2 East (BCP Site C915201B), OU-3 (BCP Site C915201D) and OU-4 (BCP Site C915201E). OU-2 East is the subject of this Decision Document.

Current Zoning and Land Use:
The site is currently zoned industrial and is generally surrounded by a mixture of industrial and commercial properties. There are a few isolated residential parcels located immediately to the north.

Past Use of the Site:
The site represents a portion of a larger former petroleum refinery facility. Since the 1880s, the site has been used for petroleum refining, storage and distribution. Parcels of land were acquired over the decades to expand the facility's operations. The eastern end of the OU-2 east site includes acquired industrial parcels that formerly contained a separate business that manufactured lead based paints and varnishes from the early 1900s. Refining operations terminated in the 1980s. The former refinery, lubricant production and the petroleum terminal, as well as paint manufacturing, activities have impacted this site.

Site Geology and Hydrogeology:
Three unconsolidated deposits exist throughout the majority of the site including a fill layer (cinders, ash, slag, sand, brick, concrete, etc.), underlain by an alluvial deposit layer consisting of silt, sands, gravel and clay and an alluvial deposit layer consisting of glacio-lacustrine clay which acts as a confining layer. Groundwater is approximately 3 to 6 feet below ground surface and generally flows south-southwest toward the Buffalo River.

A site location map is attached as Figures 1 and 2.

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 that restricts the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) were evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the Remedial Investigation (RI) to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is available in the RI Report.

SECTION 5: ENFORCEMENT STATUS

The Applicant under the Brownfield Cleanup Agreement is a Volunteer. The Volunteer does not have an obligation to address off-site contamination. The Department has determined that this site poses a significant threat to human health and the environment but there are no off-site impacts that require remedial activities; accordingly, enforcement actions are not necessary.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A remedial investigation (RI) serves as the mechanism for collecting data to:

- characterize site conditions;
- determine the nature of the contamination; and
- assess risk to human health and the environment.

The RI is intended to identify the nature (or type) of contamination which may be present at a site and the extent of that contamination in the environment on the site, or leaving the site. The RI reports on data gathered to determine if the soil, groundwater, soil vapor, indoor air, surface water or sediments may have been contaminated. Monitoring wells are installed to assess groundwater and soil borings or test pits are installed to sample soil and/or waste(s) identified. If other natural resources are present, such as surface water bodies or wetlands, the water and sediment may be sampled as well. Based on the presence of contaminants in soil and groundwater, soil vapor will also be sampled for the presence of contamination. Data collected in the RI influence the development of remedial alternatives. The RI report is available for review in the site document repository and the results are summarized in section 6.3.

The analytical data collected on this site includes data for:

- groundwater
- soil

- soil vapor
- indoor air
- sub-slab vapor

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. 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 contaminant 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 below. Additionally, the RI Report contains a full discussion of the data. The contaminants of concern identified at this site are:

benzo(a)anthracene
dibenz[a,h]anthracene
benzo(b)fluoranthene
chrysene
indeno(1,2,3-CD)pyrene
benzo(a)pyrene
petroleum products
arsenic
lead
mercury
PCB aroclor 1254
benzene
xylene (mixed)
ethylbenzene
toluene
pyrene
1,2,4-trimethylbenzene
nickel
cadmium
copper
zinc
selenium
trichloroethene (TCE)

The contaminants of concern exceed the applicable SCGs for:

- groundwater
- soil
- soil vapor
- indoor air

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 Decision Document.

The following IRM has been completed at this site based on conditions observed during the RI.

IRM - Underground Process Pipe Removal

The IRM completed in the OU-2 East area included the removal of approximately 22 miles of abandoned below ground process piping. The work was completed from 2006 to 2007. Removal of the pipelines and any product contained within them served as the source removal activities at the site. Bulk removal or treatment of petroleum contaminated soil was not implemented as a part of this IRM. The IRM work is documented in construction completion reports issued 2006 and 2007.

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. The RI report presents a detailed discussion of any existing and potential impacts from the site to fish and wildlife receptors.

The primary sources of contamination in OU-2 East are the historical petroleum refining, storage and distribution operations that have taken place across the majority of the site since the late 1800s. The site is also located in an area with an industrial history of metal production, chemical manufacturing, paint and varnish manufacturing and waste disposal.

Due to common historic operation and ownership of adjoining areas, the OU-2 West (C915201C) and OU-3 (C915201D) sites have similar petroleum contaminants in soil and groundwater. These areas are being evaluated and remediated under respective site brownfield remediation programs.

SOIL:
Petroleum Impacted Soil: Petroleum impacted soil is widespread throughout OU-2 East in the zero to four-foot depth interval and in sporadic locations greater than four feet. The greatest petroleum-related impacts were observed in samples collected during pipe removal activities, in the vicinity of former tanks, and some of the former Waste Handling Areas. The petroleum contaminated soil in these areas meets the definition of grossly contaminated media.

Surface/Near Surface Soil:
The shallow soil/fill interval (0-2 feet) was sampled for metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and polychlorinated biphenyls (PCBs). There were no exceedances of commercial soil cleanup objectives (CSCOs) for VOCs. PCB

concentrations exceeded the CSCO in one sample from the shallow soil interval (1.4 part per million [ppm]/1 ppm CSCO).

The following SVOCs exceeded CSCOs in the shallow soil interval: dibenzo[a,h]anthracene (up to 2.4 ppm/0.56 ppm CSCO), benzo[b]fluoranthene (up to 17 ppm/5.6 ppm CSCO), benzo[a]anthracene (up to 15 ppm/5.6 ppm CSCO), indeno[1,2,3cd] pyrene (up to 27.7 ppm/5.6 ppm CSCO) and benzo[a]pyrene (up to 14 ppm/1.0 ppm CSCO).

The distribution of elevated metals concentrations in the shallow interval is widespread and more randomly distributed across the site than the distribution of SVOCs. Exceedances of CSCOs include mercury (up to 11.4 ppm/2.8 ppm CSCO), lead (up to 23,800 ppm/1000 ppm CSCO), nickel (up to 1,040 ppm/310 ppm CSCO), cadmium (up to18.8 ppm/9.3 CSCO), and arsenic (up to 42.8 ppm/16 ppm CSCO).

Subsurface Soil:
Subsurface soil/fill (>2 feet) was sampled for metals, VOCs, SVOCs and PCBs. PCBs in the subsurface did not exceed CSCOs.

1,2,4 trimethylbenzene (at one location) was the only VOC to exceed the CSCO (340 ppm/190 ppm CSCO).

Multiple SVOCs exceeded CSCOs including dibenzo[a,h]anthracene (up to 32 ppm/0.56 ppm CSCO), benzo[b]fluoranthene (up to 38 ppm/5.6 ppm CSCO), benzo[a]anthracene (up to 43 ppm/5.6 ppm CSCO), chrysene (up to 72 ppm/56 ppm CSCO), indeno[1,2,3-cd]pyrene (up to 25 ppm/5.6 ppm CSCO and benzo[a]pyrene, (up to 78 ppm/1.0 ppm CSCO).

Various metals exceeded CSCOs in subsurface soils including lead (up to 450,000 ppm/1,000 ppm CSCO), cadmium (up to 89.1 ppm/9.3 ppm CSCO), mercury (up to 4.7 ppm/2.8 ppm CSCO), copper (up to 7,120/270 ppm CSCO), and zinc (up to 19,700 ppm/10,000 ppm CSCO)

The toxicity characterization leaching procedure regulatory threshold for lead (5 ppm) was exceeded in areas along the eastern portion of OU-2 East (up to 614 ppm). These exceedances appear to be associated with the disposal of white leaded paint and associated wastes.

Off-site impacts to soil from contaminants that have migrated from this site were not identified, except on the two adjacent BCP sites as noted above.

<u>GROUNDWATER:</u>
Groundwater across OU-2 East was sampled for VOCs, SVOCs, metals and PCBs.

Separate-phase petroleum product, identified as a sheen, is sporadically observed in monitoring wells and test pit trenches across OU-2 East.

VOCs: The concentrations of VOCs and SVOCs are lower along the up-gradient (or northern) portion of the site and higher towards the southern border of the site. VOC groundwater contaminants that exceed NYSDEC Ambient Water Quality Standards and Guidance Values

(AWQSGV) for Class GA groundwater include benzene up to 1,250 micrograms per liter (ug/l or ppb) (5 ppb); ethylbenzene up to 51.9 ppb (5 ppb); 1,2,4-trimethylbenzene up to 22.2 ppb (5 ppb); toluene up to 23.4 ppm (5 ppb); m,p-xylene up to 111 ppb (5 ppb); and xylenes (total) up to 143 ppm (5 ppb).

SVOCs: SVOCs at concentrations exceeding AWQSGVs were detected in several monitoring wells and Geoprobe borings located throughout OU-2 during previous investigations but have diminished to levels below the respective AWQSGV.

Metals: The AWQSGV were exceeded in at least one monitoring well for the following metals including arsenic up to 0.0645 ppm (0.025 ppm), cadmium up to 0.248 ppm (0.005 ppm), iron up to 23.2 ppm (0.3 ppm) manganese up to 4.69 ppm (0.3 ppm), selenium up to 0.186 ppm (0.01 ppm), and sodium up to 567 ppm (20 ppm). Filtered samples did not show a consistent pattern of reduced concentrations.

Total lead concentrations were consistently greater than dissolved lead concentrations. There was one exceedance of the dissolved lead AWQSGV of 25 ppb in one monitoring well, at 60.5 ppb. Historic and current data show low concentrations of dissolved lead, indicating lead is associated with suspended particulate matter.

PCBs were detected in two monitoring wells at concentrations up to 1.4 ppb (0.09 ppb).

Off-site impacts to groundwater from contaminants that have migrated from this site were not identified, except on the two adjacent BCP sites as noted above.

SOIL VAPOR, SUB-SLAB VAPOR AND INDOOR AIR

Soil vapor, sub-slab vapor and indoor air sampling was conducted during several sampling events in 2008, 2009 and 2013, including existing Buildings 152 and 153 which are the only occupied buildings situated in OU-2 East. In the 2008 evaluation, trichloroethene (TCE) (91 ug/m^3), tetrachloroethene (PCE) (120 ug/m^3) and 1.1.1-trichloroethane (111-TCA) (150 ug/m^3) were detected at a soil vapor point in an area near building 152. The presence of chlorinated compounds in this area may be due to historic vehicle maintenance activities that occurred within the building. Sub-slab vapor samples collected in 2009 revealed PCE at 35 ug/m^3 below building 152; and 111-TCA at 60 ug/m^3 and PCE at 160 ug/m^3 below building 153. A 2013 evaluation of Building 153 revealed sub-slab PCE at 11.7 ug/m^3 and PCE in 153-Indoor Air was at 0.43U ug/m^3 (non-detect). TCE in the sub-slab vapor sample was 1.03J ug/m^3 (estimated). TCE in 153-Indoor Air and 153- Indoor Air (DUP) was 33.47 and 7.42 ug/m^3, respectively. These concentrations are above the NYSDOH Air Guideline Value for air of 2 ug/m^3.

Petroleum related compounds were also detected in soil vapor, sub-slab vapor and indoor air within, and in the vicinity of, the two occupied on-site buildings. Benzene was detected in the soil vapor and sub-slab vapor up to 11 ug/m3 with indoor air concentrations up to 2.3 ug/m^3. Ethylbenzene was detected in soil and sub-slab vapor up to 7.4 ug/m^3 with indoor air concentrations up to 0.69U ug/m^3 (non-detect). Toluene was detected in the soil and sub-slab vapor up to 38.82 ug/m^3 and in indoor air up to 12.15 ug/m^3. Total xylene was detected in soil

and sub-slab vapor up to 39 ug/m^3 with indoor air concentrations up to 0.69U ug/m^3 (non-detect).

Off-site impacts to soil vapor from contaminants that have migrated from this site were not identified, except potentially on the two adjacent BCP sites as noted above.

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.*

Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by a public water supply that obtains its water from a source not affected by site contamination. The site is fenced on three sides and the Buffalo River is on the fourth side thus restricting public access. Persons who enter the site can contact contaminants in the soil or groundwater by walking on the site, digging below the surface, or otherwise disturbing the soil. Volatile organic compounds in soil vapor (air spaces within the soil) may move into buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Sampling identified impacts in indoor air quality in an existing on-site building and additional evaluation of the indoor air quality is needed. The potential exists for off-site migration of contaminants into indoor air of buildings on adjacent BCP sites.

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.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Remove the source of ground or surface water contamination.

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.

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: ELEMENTS OF THE SELECTED REMEDY

The alternatives developed for the site and the evaluation of the remedial criteria are presented in the Alternative Analysis. The remedy is selected pursuant to the remedy selection criteria set forth in DER-10, Technical Guidance for Site Investigation and Remediation and 6 NYCRR Part 375.

The selected remedy is a Track 4 restricted use with site specific cleanup objectives remedy.

The selected remedy is referred to as the remedy.

The elements of the selected remedy, as shown in Figure 3, are as follows:

1. REMEDIAL DESIGN

A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remediation 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 gas 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. REMOVAL OF STRUCTURES

The soil stabilization remedial element described below will require the removal of an abandoned and covered concrete tank as well as process structure foundations, floor slabs and removal any remaining process piping encountered during the execution of the stabilization task. An estimated 15,000 cubic yards of concrete will be removed from the subsurface to allow for in situ stabilization/treatment of soils. The concrete will be processed on-site and placed below the one-foot cover or used as road base and installed beneath permanent pavement. An estimated 1,500 lineal feet of process piping is anticipated to be encountered during concrete removal or in situ stabilization/treatment activities. The pipe will be removed from the subsurface, drained of contents and removed from the site for either proper disposal or recycling

3. IN-SITU STABILIZATION

In-situ stabilization (ISS) will be implemented on all grossly contaminated soils, as defined in 6 NYCRR Part 375 1.2(u), and all characteristically hazardous lead soil/fill across the site with the exception of soils covered by pavement or buildings in the immediate vicinity of the actively used Buckeye Terminal buildings located at the south eastern portion of the site. These soils will be further assessed and remediated if/when the buildings and/or pavement are removed. Grossly contaminated soil is prevalent throughout the ExxonMobil and Buckeye Terminal properties on OU-2 East. Hazardous lead soils are situated in the eastern portion of OU-2 East. Hazardous lead soils will be stabilized throughout their depth. The depth of stabilization for grossly contaminated soil will vary across the site including:

- to the depth of the underlying clay confining layer;
- to the depth of the water table; or
- five feet below ground surface.

The contaminated soil will be mixed in place with stabilizing agents using an excavator or augers. The stabilized soil will then be covered with a cover system as described in element 5 to prevent direct exposure. This treatment changes the contamination from a soluble form to a stable, insoluble compound to reduce or eliminate the matrix as a source of groundwater contamination. For grossly contaminated soils the treatment will also remove/reduce the gross characteristics of the soil (i.e., odors, sheen, photoionization detector readings, etc.).

In-situ treatment of grossly impacted soils: Approximately 204,000 cubic yards of grossly contaminated soil will be stabilized. In areas where existing data indicates that soils are impacted below five feet the depth of treatment will extend to the clay surface or to the water table whichever is shallower. Pilot scale testing will be conducted to assess the appropriate soil amendment such as Portland cement or lime kiln dust. Some petroleum impacted soils below paved areas and under, or immediately adjacent to, buildings may be left in place, provided that the pavement is competent.

In situ stabilization of lead impacted soils: Approximately 12,000 cubic yards of lead impacted soil will be stabilized. Lead impacted soils will be stabilized by amending the soils with Portland cement or other chemical fixation treatments. The impacted soils will be stabilized from ground surface to the underlying clay stratum. During implementation of the remedy, samples of the stabilized soils will be analyzed for leachable lead.

4. HYDRAULIC CONTROL

Hydraulic control of groundwater to minimize groundwater migration from off-site areas onto the site will be provided by extending the soil stabilization into the lacustrine clay along the up-gradient areas of the site. The depth to clay is greater than 5 feet at localized areas along Elk Street, along the eastern border of OU-2 East and areas adjacent to Babcock Street on the western side of the site. In these areas, the depth of soil stabilization will be increased until the lacustrine clay is encountered. The minimum width of the deepened section will be approximately three feet wide. Additional soil stabilization for hydraulic control to limit groundwater flow onto OU-3 (BCP Site C915201D) will include the depth of treatment extended to the lacustrine clay layer along the border between OU-2 East and OU-3. Stabilized soils will achieve a maximum hydraulic conductivity of $1x10^{-6}$ cm/sec.

5. COVER SYSTEM

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) and over stabilized/treated soil. 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. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

6. INSTITUTIONAL CONTROLS

Imposition of an institutional control in the form of an environmental easement will be required. The remedy will achieve a Track 4 commercial cleanup at a minimum and will include an environmental easement and site management plan as described below.

Institutional Control

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

- requires 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 and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts 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
- requires compliance with the Department approved Site Management Plan.

7. SITE MANAGEMENT PLAN

A Site Management Plan, which includes the following:

a. 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 6 above.

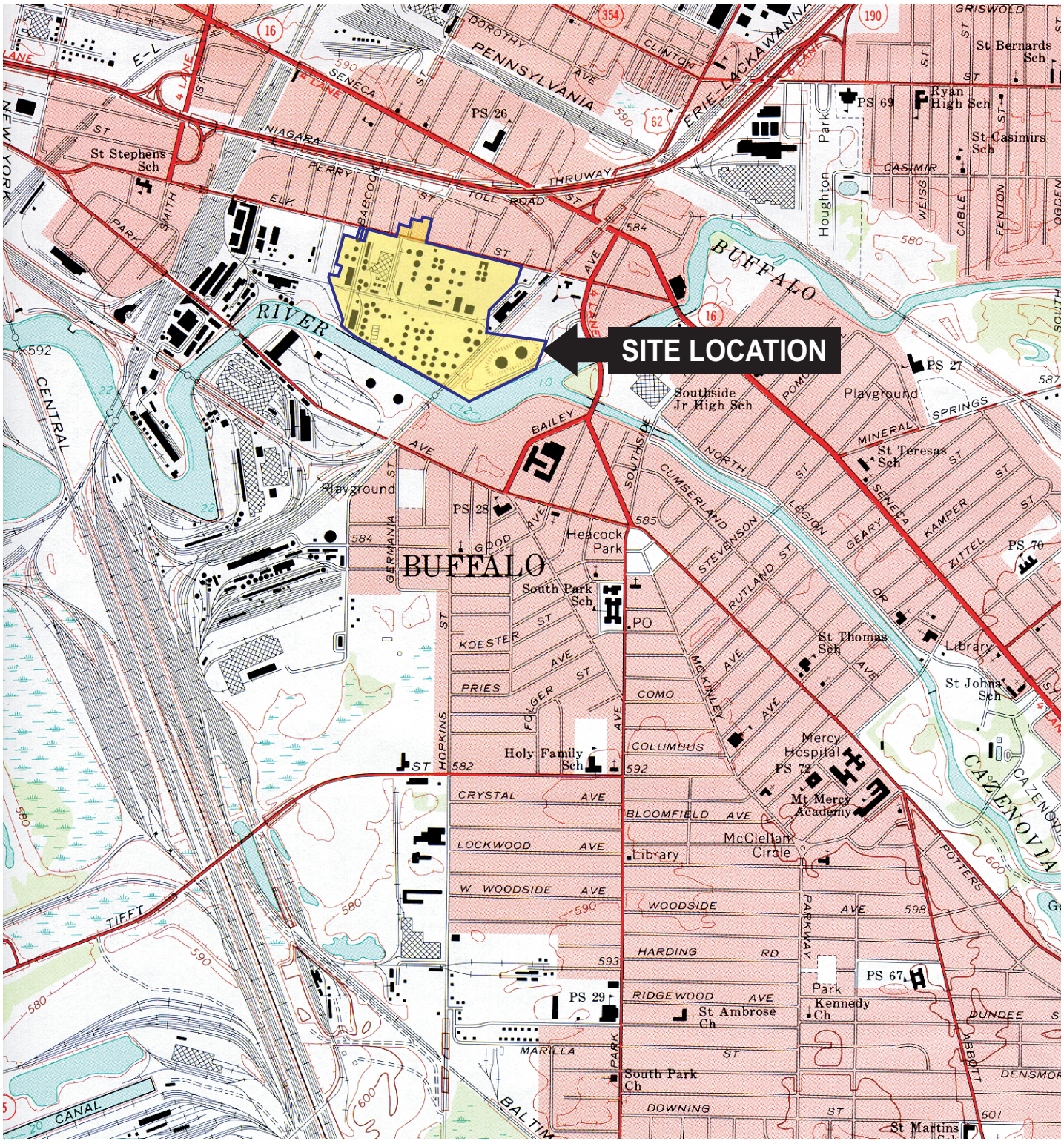
Engineering Controls: The site cover discussed in Paragraph 5.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
- a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures which will remain are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department determination of the need for a remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for the site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment. This includes grossly impacted soil and former refinery piping that may be located beneath or in the immediate vicinity or the two large buildings located on Buckeye Terminal property at the south east portion of the site.
- a provision for evaluation of the potential for soil vapor intrusion for any current or new buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- a provision that should an existing or future building or building foundation be demolished in the future, a cover system consistent with that described in Paragraph 5 above will be placed in any areas where the upper one foot of exposed surface soil exceeds the applicable SCOs;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- 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:

- monitoring of groundwater to assess the performance and effectiveness of the remedy; and
- a schedule of monitoring and frequency of submittals to the Department.
- monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.



QUADRANGLE LOCATION

SOURCE:
USGS; 1965, Buffalo SE, New York
7.5 Minute Topographic Quadrangle

N

0 2000'

Title:

SITE LOCATION MAP

EXXONMOBIL FORMER BUFFALO TERMINAL, BUFFALO, NEW YORK

Prepared for:

EXXONMOBIL OIL CORPORATION

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.K.	Date: 29AUG12	FIGURE
Prepared by: J.A.D.	Scale: AS SHOWN	1
Project Mgr.: N.C.	Project No.: 0172.0052Y015	
File No.: 0172.0052Y441.02.CDR		

V:\CAD\PROJECTS\0172\Y0052Y441\0172.0052Y441.02.CDR

Existing
OU-1 Site
C915201

0.3 ac.

OU-2 West
Site
C915201 C

OU-2 East Site
C915201B

22.7 ac.

4.1 ac.

6.7 ac.

OU-3 Site
C915201D

6.8 ac.

16.7 ac.

OU-4 Site
C915201E

17.0 ac.

Exhibit C:
Current Proposed BCA Divisions
as of Feb. 20, 2017

- Original Exxon-Mobil BCA (OU-1)
- New ESCP BCA Application (OU-2, partial)
- New ESCP BCA Application (OU-2, partial)
- New ESCP BCA Application (OU-3)
- New Exxon-Mobil BCA Application (OU-4)

Elk Street
Commerce Park, LLC

Figure 2

2/20/17

LEGEND

- LEAD IMPACTED SOILS, STABILIZE TO CLAY. NOTE (1)
- PETROLEUM IMPACTED SOILS, TREAT TO CLAY FOR HYDRAULIC CONTROL. NOTE (1)
- SHALLOW PETROLEUM IMPACTED SOILS, TREAT TO CLAY, OR A DEPTH OF 5 FEET BELOW EXISTING GRADE NOTES (2,3)
- PETROLEUM IMPACTED SOILS GREATER THAN 5 FEET BGS, TREAT TO CLAY OR GROUNDWATER TABLE, WHICHEVER IS SHALLOWER. NOTE (4)
- SOIL EXCEEDANCE EXCAVATION
- GROUNDWATER
- (10) SOIL DEPTH TO CLAY CONTOUR (FROM EXISTING GRADE)
- SVOC SOIL IMPACTED EXCAVATION LIMITS
- LEAD IMPACTED SOIL EXCAVATION LIMITS

NOTES

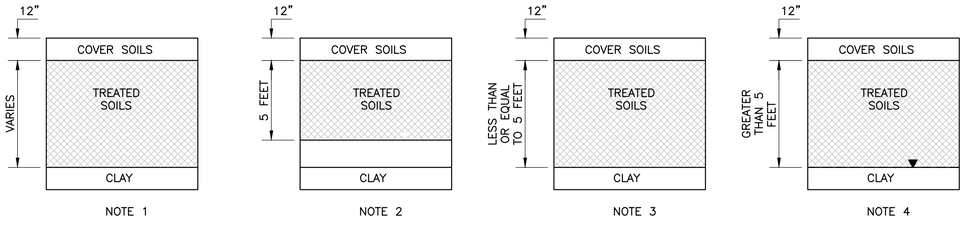


Figure 3

0 40 80 160
SCALE IN FEET

Prepared/Date: JVM 04/07/17
Checked/Date: RSE 04/07/17

ELK STREET PROPERTY BUFFALO, NEW YORK	armec foster wheeler Environment & Infrastructure, Inc. 511 Congress Street, Suite 200 Portland, ME (207)-775-5401	REMEDIAL ALTERNATIVES 6 PLATE 15