ELK STREET PROPERTIES AREA
INVESTIGATION COMPLETION REPORT

Buffalo Terminal
Location No. 31-010
Buffalo, New York

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1.0 INTRODUCTION

Roux Associates, Inc. (Roux Associates) has prepared this report on behalf of ExxonMobil Oil Corporation (ExxonMobil) to document the completion of investigation activities at Parcels No. 4 and No. 5 of the Elk Street Properties Area (ESPA) of the Buffalo Terminal (Site) located at 625 Elk Street, Buffalo, New York (Figure 1). The final sampling event of the ESPA investigation (ESPA Investigation Completion) was conducted on December 14, 2001. The ESPA is one of nine geographic areas of the Site that have been defined for the purpose of assessing environmental conditions and reporting the results of area-specific activities (Figure 2).

This work was performed in accordance with the Work Plan for Completion of Site Investigation on the Elk Street Properties Area (Work Plan) dated March 29, 2001 (Roux Associates 2001a) and subsequent letter correspondence from the New York State Department of Environmental Conservation (NYSDEC) dated May 31, 2001 (NYSDEC 2001a) and July 17, 2001 (NYSDEC 2001b).

There are five parcels that comprise the ESPA. This report focuses on investigation results for Parcels No. 4 and No. 5 of the ESPA (Figure 2), since these parcels were affected by a product release that occurred at the Site in 1976. This product release is discussed further in Section 2.0.

The work completed on December 14, 2001 and described in this report was conducted in response to comments received from NYSDEC in a letter dated June 9, 2000 (NYSDEC, 2000) regarding the Site Facility Investigation (SFI) Completion Report dated December 14, 1999 (Roux Associates, 1999). The scope of work described in Section 5 of this report was developed based upon a review of the existing data available for the ESPA. The objectives of the investigation in Parcels No. 4 and No. 5 of the ESPA were to develop the site-specific data necessary to:

- Supplement previous investigations in order to complete the description of environmental conditions within Parcels No. 4 and No. 5 of the ESPA;
- Conduct an exposure assessment; and
- Evaluate remedial alternatives.

To achieve these objectives, the scope of work completed in December 2001 included a soil boring and sampling program to build upon the previous investigations in the ESPA and to complete the description of the soil conditions throughout the ESPA.

The remainder of the Report is organized as follows:

- Section 2.0 provides a summary of the history of the ESPA, including ownership, past and present operations (i.e., buildings, etc.) and spills or releases;
- Section 3.0 provides a summary of environmental conditions based upon the results of previous investigations;
- Section 4.0 presents the rationale for selection of locations sampled during the ESPA Investigation Completion;
- Section 5.0 presents the scope of work that was conducted during the ESPA Investigation Completion;
- Section 6.0 presents the results of the previous and current investigations on the ESPA;
- Section 7.0 presents a summary of findings and conclusions; and
- Section 8.0 presents references.

Included with the Report is the following appendix:

- Appendix A: Soil Boring Logs for Borings Installed on December 14, 2001

2.0 ELK STREET PROPERTIES AREA DESCRIPTION AND HISTORY

The historical information presented in this Section was based on the document entitled "History of Operations at Buffalo Terminal" (History Document) dated April 26, 2000 (Roux Associates, 2000) and more recent information contained in ExxonMobil records regarding current conditions on the ESPA. The History Document indicated that Parcel No. 4 of the ESPA was occupied by Trico Products Corp, however, both parcels are currently vacant and enclosed by a fence installed by ExxonMobil in July 2000.

Historically, the major Site refinery and terminal operations occurred south of Elk Street in an area of approximately 89 acres. The petroleum refining operations at the Site began during 1880. The majority of the Site was purchased by Standard Oil Company of New York (SOCONY), ExxonMobil's predecessor, in 1892. In May 1981, the Site terminated all refinery operations. The Site continued to operate only as a distribution terminal, receiving product via a pipeline and barge.

Throughout the Site's history, the areal extent of property owned by ExxonMobil changed as portions of property, including the ESPA, were acquired or sold for various reasons. The area within the current ExxonMobil property boundary is 78.3 acres.

Historical information is provided below for the ESPA, including buildings, structures and product releases.

2.1 General History of the ESPA

There are five parcels associated with the ESPA, all located on the north side of Elk Street. As discussed previously, the focus of this investigation will be on Parcels No. 4 and No. 5. Parcel No. 4 is a 0.3 acre parcel located in the northwest corner of Elk Street and Winona Street (Figure 3). Parcel No. 5 is a 1.5-acre parcel located on the north side of Elk Street, between Winona Street and Bradford Street. These properties were purchased by ExxonMobil following a product release from Tank 60, which occurred on March 12, 1976.

2.2 Former and Current Structures

The following is a brief description of former structures that existed between 1900 and 1976 based on a review of Sanborn Fire Insurance Maps and aerial photographs (discussed in detail in the History Document):

- The two rows of structures on Parcel No. 4, shown on Figure 3, have been present at the time of the Tank 60 incident, were present throughout this period.
- A building was present on the second lot west of Winona Street on Parcel No. 4 from 1900 to between 1938 and 1940.
- The northeastern portion of Parcel No. 5 was vacant throughout this period.
- Six of the seven building lots on Parcel No. 5 that front Winona Street were occupied by residential buildings at one time or another during this period and the southernmost lot fronting Winona Street was vacant throughout this period.
- Five of the seven building lots on Parcel No. 5 that front Elk Street were occupied by residential buildings at one time or another during this period. The second lot east of Winona Street and the lot adjacent to Bradford Street were vacant throughout this period.

ExxonMobil purchased Parcels No. 4 and No. 5 following the incident involving Tank 60 in March 1976 and demolished the structures present, as described below. Figure 3 shows the buildings that were present prior to the March 1976 incident involving Tank 60 and that were either subsequently demolished or are currently existing to the north of Parcel No. 5. Since 1976, the Parcels No. 4 and No. 5 have primarily remained vacant, being used for parking during portions of this time period.

Currently, Parcels No. 4 and No. 5 are vacant. Structures that currently exist to the north of Parcel No. 5 and that existed at the time of the former Tank 60 incident, are shown on Figure 3. ExxonMobil installed a chain link fence around both parcels on July 5, 2000. Both parcels are periodically inspected for evidence of trespassing.

2.3 Spills/Releases

One significant spill was documented to have impacted Parcels No. 4 and No. 5 in the ESPA (Table 1). The documentation for this spill was received in the form of information provided by current and/or former ExxonMobil employees, photographs taken at the time, and NYSDEC Spill Report Form for Spill No. 9314016, dated February 1, 1994.

The product release occurred on March 12, 1976. The roof of Tank 60 ruptured when hot cracking stock for the Thermofor Catalytic Cracking (TCC) unit entered the tank from the crude unit. The hot product contacted ice in the bottom of the tank, causing it to expand, increase the pressure within the tank and damage the roof. The cracking stock spilled onto Elk Street and Parcels No. 4 and No. 5. At that time, Parcels No. 4 and No. 5 were vacant or occupied by residential and/or light commercial structures, as described above. The structures present were affected by the release. ExxonMobil cleaned up the cracking stock by vacuuming off excess product and then mixing the remaining material with sand, excavating the material and disposing it off-site. Subsequently, ExxonMobil purchased Parcels No. 4 and No. 5 and demolished the structures present. Property and structures located to the north of Parcels No. 4 and No. 5 were not impacted by the release and therefore were not purchased by ExxonMobil (Figure 2). Soil sampling was not conducted as part of the cleanup or demolition effort.

3.0 SUMMARY OF ENVIRONMENTAL CONDITIONS

Data regarding environmental conditions at the Site, and particularly the ESPA, were obtained from a review of the results of previous investigations and the ongoing monitoring program at the Site. Figure 3 presents sampling locations from previous investigations, locations sampled in December 2001 during the ESPA Investigation Completion, existing buildings that were present during the incident and former buildings that were present prior to the Tank 60 incident and subsequently demolished.

3.1 Previous Investigations

The results of the investigation activities conducted to complete the assessment of the ESPA, described in Section 6 of this report, supplement the following previous investigations conducted in the ESPA:

Environmental Site Assessment, conducted by Groundwater Technology, Inc. (GTI) in October 1993 (GTI, 1994)

This Site assessment included:

- installation of 15 shallow and five deep soil borings;
- collection and inspection of soil samples from the upper two feet of each boring (1-2 feet below land surface [bls]);
- analysis of one composite soil sample (designated SS#1 through SS#4) from four groups of five borings for TPH, chloride and metals (a different color symbol is used on Figure 3 to represent each group of five borings that contributed to the four composite samples analyzed);
- installation of temporary well points at the five deep soil boring locations (TWP-01 through TWP-05); and
- groundwater sampling at four of the five temporary well locations (TWP-02 through TWP-05) for TPH, chloride and metals.

Site Facility Investigation, conducted by Groundwater & Environmental Services, Inc. from June through August 1998 (Roux Associates, Inc., 1998)

This investigation included:

- completion of 12 soil borings (ESL-1 through ESL-12);
- collection of 12 surface soil samples from ESL-1 through ESL-12 from 0-0.5 feet below any surface concrete, asphalt or debris present and analysis for semivolatile organic compounds (SVOCs) and metals;
- collection of three soil samples from 1.5-2 feet below surface material at ESL-4, ESL-8/ ESL-W1 and ESL-12 and analysis for volatile organic compounds (VOCs);
- collection of one soil sample from 8-10 feet bls at ESL-8/ESL-W1 and analysis for SVOCs, VOCs and metals; and
- installation and groundwater sampling of one soil boring/temporary well (ESL-8/ ESL-W1) and analysis for SVOCs and VOCs.

ESL-8/ESL-W1 was abandoned by removing the screen and casing and grouting the hole following the completion of the SFI.

Site Facility Investigation Completion, conducted by Groundwater & Environmental Services, Inc. and Roux Associates from July through October 1999 (Roux Associates, Inc., 1999)

This investigation included:

- completion of eight soil borings, ESL-13 through ESL-20 (five borings on the ESPA and three borings on properties to the north of the ESPA) to depths up to four feet bls; and
- collection of soil samples in three depth ranges (0-0.5 feet, 1-2 feet and 2-3 feet below any concrete, asphalt or debris material present at the boring location) and analysis for SVOCs and metals.

3.2 Environmental Quality

Roux Associates reviewed the data generated during prior investigations to evaluate soil and groundwater quality and the occurrence of separate-phase product in the ESPA. The following is a brief summary of the existing data.

3.2.1 Soil Quality

Tables 2 through 4 summarize analytical results for SVOCs, metals and VOCs, respectively, for the soil samples collected in the SFI and SFI Completion, as well as during the ESPA

Investigation Completion. Soil quality data from previous investigations has been compared to NYSDEC soil quality criteria. This type of comparison enables identification of areas that may pose a potential risk under a residential land use scenario, as well as those areas that may have potential to impact groundwater at concentrations exceeding drinking water standards. The soil quality data generated during previous investigations, described below, and the data generated during the investigation described in Section 5 of this report, have been evaluated against the criteria presented in the following NYSDEC documents:

- NYSDEC Recommended Soil Cleanup Objectives (RSCOs) presented in the "Division of Hazardous Waste Remediation. Division Technical and Administrative Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels" (NYSDEC 1994); and

- NYSDEC revised soil cleanup criteria tables for TAGM 4046 for gasoline and fuel oil contaminated soil dated August 22, 2001 (NYSDEC 2001c).

As a note, the RSCO for lead presented in TAGM 4046 is site background. TAGM 4046 provides a range of average site background levels for lead in metropolitan or suburban areas or areas near highways between 200 milligrams per kilogram (mg/kg) and 500 mg/kg. For comparison purposes in the following discussion, 500 mg/kg was used for lead.

The soil quality has been impacted in limited areas by the product release from Tank 60 that occurred on March 12, 1976 in the northeast portion of Parcel No. 5. Elsewhere on Parcel No. 5, on Parcel No. 4 and to the north of Parcel No. 5, soil quality has been impacted by background influences (i.e., industrial and residential). Data collected during previous investigations has shown that SVOCs detected in soils exceed the RSCOs to depths up to three feet below any surface material in and around the ESPA. The distribution of metals exceeding RSCOs is more widespread throughout the ESPA and properties to the north of Parcel No. 5. For VOCs, no RSCOs have been exceeded in any samples collected to date.

TPH Results

The site assessment performed by GTI in October 1993 detected total petroleum hydrocarbon (TPH) concentrations ranging from 180 mg/kg in the composite sample SS#2 to 7,200 mg/kg in the composite sample SS#3 collected from 1-2 feet bls on Parcel No. 5. Figure 3 shows the

locations of the samples that comprised the composite. Table 2 presents the TPH data for the composite samples.

The TPH concentration in the composite sample collected on Parcel No. 4 (SS#1) was 300 mg/kg. However, it is important to note that four of the five sample locations on Parcel No. 4 that contributed to the composite sample were collected from locations where structures existed at the time of the incident. Therefore, this composite is not representative of the potential impacts from the incident.

VOC Results

During the SFI, three locations (ESL-4, ESL-8/ESL-W1 and ESL-12) were sampled at 1.5-2 feet below surface material present (asphalt, concrete, debris) and one location (ESL-8/ESL-W1) was sampled at 8-10 feet bls and analyzed by USEPA Method 8021 for the STARS Memo #1 VOC analytes.

The results indicated that no VOCs were detected above the reported sample detection limit at ESL-12 (1.5-2 foot depth) and ESL-8/ESL-W1 (8-10 foot depth). At the remaining locations, ESL-4 and ESL-8/ESL-W1 (1.5-2 foot depth), no VOCs exceeded RSCOs.

SVOC Results

During the SFI, surface soil samples (0-0.5 feet below any surface material such as concrete, asphalt, debris) were collected at 12 sample locations (ESL-1 through ESL-12) in the ESPA and a deeper sample from 8-10 feet was collected at one location (ESL-8/ESL-W1). These samples were analyzed by USEPA Method 8270 for the STARS Memo #1 SVOC analytes. The RSCO for individual SVOCs were exceeded in surface soils for at least one compound at each of the sampling locations. No SVOCs were detected above the detection limit in the deeper sample collected at ESL-8/ESL-W1 (8-10 foot depth). The RSCO for Total SVOCs of 500,000 micrograms per kilogram (µg/kg) was exceeded at ESL-12 (0-0.5 foot interval).

Results of the SFI Completion also indicated the presence of SVOCs in soil. RSCOs were exceeded for at least one compound at each of the sampling locations in the 0-0.5 foot interval,

including offsite locations north of Parcel No. 5 (ESL-16, ESL-17 and ESL-20). RSCOs were exceeded for at least one compound at all but one (ESL-19) of the sampling locations in the 1-2 foot interval. Finally, at the 2-3 foot interval, RSCOs were exceeded for at least one compound at ESL-13, ESL-14, ESL-15 and ESL-17.

The results of the SFI and SFI Completion samples indicate that SVOC concentrations at all depths sampled are higher in the northeast corner of Parcel No. 5 than elsewhere on or to the north of that parcel and that concentrations decrease with depth.

Metals Results

The 1993 GTI site assessment detected arsenic, barium, cadmium, chromium, lead, and mercury in composite surface soil samples at concentrations exceeding RSCOs.

During the SFI, concentrations of several metals (cadmium, chromium, lead, mercury, nickel, selenium, and vanadium) exceeded the RSCOs at multiple sample locations. Finally, several metals (cadmium, chromium, lead, mercury, nickel, selenium, thallium, and vanadium) were detected at concentrations exceeding RSCOs in multiple locations during the SFI Completion. No pattern to the exceedances of RSCOs for metals was observed in the ESPA during the SFI and SFI Completion.

3.2.2 Groundwater Quality

The following is a summary of the groundwater monitoring that has been performed in the ESPA.

In the discussions of previous investigations that follow, the groundwater data collected during these investigations is compared to the NYSDEC Ambient Water Quality Standards and Guidance (AWQSG) values for Class GA groundwater presented in the Division of Water Technical and Operational Guidance Series (1.1.1) "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" (NYSDEC, 1998) as amended in April 2000. Tables 5, 6 and 7 summarize analytical results for SVOCs and TPH, VOCs and metals, respectively, for the groundwater samples collected during the SFI and 1993 GTI Site Assessment.

TPH, VOC and SVOC Results

During the 1993 GTI site assessment of the ESPA, four temporary wells (TWP-02, TWP-03, TWP-04, and TWP-05) were sampled for TPH. A fifth well (TWP-01) could not be sampled due to insufficient water yield. The TPH concentration detected in temporary well point TPW-03 (located near ESL-8/ESL-W1) was 5.7 micrograms per liter (µg/kg). TPH was not detected in the other three samples. The temporary well point sample locations are shown on Figure 3.

Soil boring ESL-8, installed during the SFI in June 1998, was completed as temporary well ESL-8/ESL-W1. The temporary well (ESL-8/ESL-W1) was sampled and analyzed by USEPA Methods 8021 and 8270 for the STARS Memo #1 VOC and SVOC analytes. No VOCs or SVOCs were detected above the detection limit at this location. ESL-8/ESL-W1 was located in the vicinity of TWP-03 where TPH was detected at 5.7 µg/L during the 1993 GTI investigation.

Metals Results

During 1993 GTI site assessment, TWP-02, TWP-03, TWP-04, and TWP-05 were also sampled for arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver by USEPA method 6010 and chloride by USEPA method 325.2. A fifth well (TWP-01) could not be sampled due to insufficient water yield. NYSDEC AWQSGs were exceeded for chloride, arsenic, chromium, lead, and selenium.

3.2.3 Separate-Phase Product

No separate phase product was detected in any of the ESPA temporary well points.

4.0 RATIONALE FOR SELECTION OF LOCATIONS SAMPLED DURING THE ESPA INVESTIGATION COMPLETION

This Section identifies the rationale for selecting sample locations to complete the characterization of environmental conditions in the ESPA. The assessment items included areas of known and suspected environmental impact due to the product release from Tank 60 that occurred in March 1976. As described in Section 2, following the Tank 60 incident, ExxonMobil purchased property and structures impacted by the release. Subsequently, these structures were demolished and debris was disposed offsite. The property and structures located to the north of Parcel No. 4 and No. 5 (Figure 3) were not impacted by the release and therefore were not purchased by ExxonMobil after the incident.

The locations of additional soil samples conducted in December 2001, were selected based upon historical information and previous sampling results. In addition, sample locations were selected to respond to NYSDEC comments on the SFI Completion Report provided in their June 9, 2000 letter to ExxonMobil (NYSDEC 2000), which required additional delineation to the north of Parcel No. 5 and on Parcel No. 4 and their letter to ExxonMobil dated July 17, 2001, that requested relocation of ESL-21 (Figure 3) to the north side of the residential parking pad to the north of Parcel No. 5 (NYSDEC 2001b).

The rationale for selecting additional sample locations on the properties to the north of Parcel No. 5 was to complete the delineation of impacts to these properties that were not purchased by ExxonMobil following the incident because they were not believed to have been impacted.

The rationale for selecting additional sample locations on Parcel No. 4 was that the previous investigation work conducted in 1993 was not representative of the potential impacts that may have resulted from the Tank 60 incident. For example, four of the five soil boring locations that contributed to the single composite sample analyzed from Parcel No. 4 during the 1993 GTI investigation (see Figure 3) were collected from locations where structures existed at the time of the incident. Therefore, the composite sample likely underestimated potential impacts due to the incident because the locations beneath buildings would not be expected to have been impacted by the incident. Additional soil samples on Parcel No. 4 were collected from areas where no structures existed at the time of the incident. In addition, only TPH sampling has been conducted

on Parcel No. 4 during previous investigations. The additional soil samples were analyzed for NYSDEC STARS SVOCs and metals.

Further groundwater sampling in the ESPA was not conducted for several reasons:

- No VOCs were detected at one of the three locations (ESL-12) sampled in the 1.5 to 2 foot bls interval. At the other two locations (ESL-4 and ESL-8/W-1) several VOCs were detected in this interval, but none exceeded NYSDEC RSCOs;
- VOCs were not detected at 8-10 feet bls;
- SVOCs levels in soil decreased with depth and were non-detect at 8-10 feet bls;
- TPH impact to groundwater was observed at only one out of four locations sampled during the 1993 GTI investigation (TPH = 5.7 µg/L at TWP-03);
- No VOCs or SVOCs were detected in the groundwater sample collected from ESL-8/ ESL-W1 during the SFI which was located in the vicinity of the temporary well TWP-03; and
- The groundwater in the vicinity of the Site is not used for water supply.

5.0 SCOPE OF WORK

The scope of work completed in December 2001 included a soil boring and sampling program.

5.1 Soil Boring and Sampling

A soil boring and sampling program was performed to expand upon the data collected during previous investigations in the ESPA. A total of six soil borings (three on Parcel No. 4 and three to the north of Parcel No. 5) were completed in the locations presented on Figure 3. The objective of the soil investigation was to collect soil samples for analysis to delineate the nature and extent of petroleum-related impacts from the former Tank 60 incident.

A hand auger was used to collect soil samples from land surface to three feet below land surface at the locations shown on Figure 3. Where material such as concrete, asphalt or debris was present at the surface at the boring location, it was removed and the soil sample was collected from below that material. The supervising technical staff inspected all soil samples and recorded all applicable lithologic characteristics. In addition, all soil samples were visually inspected for evidence of separate-phase product (i.e., odors, staining, etc.) and screened for organic vapors with a photoionization detector (PID). Based on the results of the previous work, two soil samples were retained for laboratory analysis from each boring, one from the 0-0.5 foot interval below any surface material present and a second from the 2-3 foot interval below any surface material present.

Soil samples retained for laboratory analysis from selected intervals were analyzed for SVOCs according to USEPA Method SW846 8270 for NYSDEC STARS list compounds, and reduced Target Analyte List (TAL) metals by Method SW846 6010B for cadmium, chromium, lead, nickel, selenium, thallium and vanadium and Method SW846 7421 for mercury.

Boring locations were surveyed for horizontal and vertical coordinates relative to the New York State Plane Coordinate System by a surveyor licensed in the State of New York after completion in February 2002. Horizontal coordinates are accurate to ±0.1 feet and vertical coordinates are accurate to ±0.01 feet.

6.0 INVESTIGATION RESULTS

The following sections present the results of the ESPA Investigation Completion activities conducted on December 14, 2001, as well as the results of previous investigations, to describe the environmental conditions in this area. These activities update the description of the geology and soil quality in the ESPA presented in Section 3 of this report. Although groundwater was not encountered in any of the locations sampled, a description of the Site hydrogeology based on available data is also presented below. The discussions below focus on the contaminants of concern (SVOCs and metals) that are associated with the release at Tank 60 and the industrial/residential background influences in the ESPA.

6.1 Geology

The Buffalo Terminal is located within the Erie-Ontario Lowland physiographic region of the Interior Plains Division. In general, the region is underlain by Silurian and Devonian age interbedded shales, siltstones, sandstones, limestones and dolomites, dipping approximately 0.50 degrees to the south.

According to data from existing well and soil boring logs from previous investigations, three unconsolidated deposits exist at the ESPA. The first is a fill layer that consists of black cinders, silt, gravel, sand, slag, brick, coal and wood. The second unit consists of alluvial deposits of silts, silts and clays, sands, and sands and gravel. The third unit is a gray to brown glacio-lacustrine clay.

Based upon the boring log from ESL-8/ESL-W1, which was completed to a depth of 16 feet bls, the fill layer was approximately two-foot thick and was underlain by a layer of silt and clay from 2-4 feet bls and clay from 4-16 feet bls. Based upon the boring logs from ESL-13 through ESL-26, which were completed to depths up to four feet bls, fill thickness ranged from one foot to four feet. Fill was underlain by silts, sands and gravel intermixed with clay. Bedrock was not encountered in any of the borings installed in the ESPA. The presence of the three unconsolidated deposits is consistent with geologic logs from borings and wells installed on the main portion of the Site south of Elk Street.

6.2 Hydrogeology

The water Table was encountered at approximately five feet below land surface at ESL-8/ ESL-W1 during its installation. No additional depth to water measurements were recorded at this well. This temporary well was abandoned by removing the screen and casing and grouting the hole following the completion of the SFI. Based upon available information, the overburden aquifer in the vicinity of the Site is not used for water supply. Based upon data collected from wells on the main portion of the Site south of Elk Street and west of the Erie-Lackawanna Railroad, the groundwater flow direction is generally southwest toward the Buffalo River.

6.3 Soil Quality

The following sections present the results of the soil sampling program conducted during the ESPA Investigation Completion on December 14, 2001 and the results of previous investigations, to provide a comprehensive evaluation of the available soil quality data throughout this area.

Soil samples were collected and analyzed from the locations described in Section 3 (for previous investigations) and Section 5 for the ESPA Investigation Completion. Tables 2 through 4 summarize analytical results for SVOCs, metals and VOCs, respectively, for the soil samples collected during the ESPA Investigation Completion, as well as previous investigations.

NYSDEC RSCOs were used to evaluate the soil quality data at the Site. Evaluation of soil quality data relative to the RSCOs enables identification of areas that may pose a potential risk under a residential land use scenario, as well as those areas that may have potential to impact groundwater at concentrations exceeding drinking water standards.

In addition to the NYSDEC RSCOs, the shallow soil quality data (from the 0-0.5 foot interval only) from previous and current investigations was compared to the Mean Background Concentrations (Mean Background) listed in the New York State Department of Health (NYSDOH) final technical report entitled “Seneca-Babcock Neighborhood Soil Sampling Program” dated July 1998 (NYSDOH 1998). As directed by NYSDEC in their letter to ExxonMobil dated May 31, 2001, these Mean Background levels are only applicable to shallow samples since the NYSDOH sampling plan only investigated surface soil samples. For some

compounds, the Mean Background level is higher than the RSCO, while in some cases it is lower. A comparison of the NYSDEC RSCOs to the NYSDOH Mean Background levels for shallow soil is presented in Table 8.

The NYSDOH soil-sampling program indicated a widespread distribution of SVOCs and metals throughout the Babcock Street Neighborhood. Thirteen of the 18 SVOCs analyzed by the NYSDOH were detected in all 24 locations sampled during their study. Three SVOCs were detected in 23 of the 24 locations and one SVOC was detected in 22 of the 24 locations. Naphthalene, which was not detected above the RSCO in any of the ESPA samples, was detected by NYSDOH in 15 of the 24 samples.

Seven of the eight metals that have been sampled for during the three investigations on the ESPA, were detected at all 24 NYSDOH sample locations. Selenium was detected in 18 of the 24 locations.

Summary maps (Plates 1 through 4) were prepared using the analytical database and MapInfo™ Geographic Information System (GIS) Software to show soil concentration data for SVOCs and metals from the current and previous investigations relative to the RSCOs and NYSDOH Mean Background Levels (for shallow soil only). The maps only present data for the target analytes that exceeded NYSDEC RSCOs in at least one sample. The following is a summary of the maps that are included:

- Plate 1 presents soil quality results for individual SVOCs and Total SVOCs from soil sample locations in three depth intervals compared to RSCOs and the distribution of Total SVOCs by concentration;
- Plate 2 presents a comparison of shallow soil quality data (0-0.5 foot interval only) relative to the NYSDEC RSCOs and the NYSDOH Mean Background levels for SVOCs;
- Plate 3 presents soil quality results for metals from soil sample locations in three depth intervals; and
- Plate 4 presents a comparison of shallow soil quality data (0-0.5 foot interval only) relative to the NYSDEC RSCOs and to the NYSDOH Mean Background levels for metals.

Based upon the data from the investigations completed in the ESPA, the impacts resulting from the release at former Tank 60 have been delineated. The results indicate that:

- The only area of the ESPA where petroleum-related impacts from the release at former Tank 60 are present is in the northeast portion of Parcel No. 5 (ESL-12, ESL-13, ESL-14 and ESL-15).

- There is no apparent pattern to the areal distribution of elevated SVOC concentrations or exceedances of RSCOs across the remainder of Parcel No. 5, Parcel No. 4 or the properties to the north of Parcel No. 5 (which were not purchased after the release at former Tank 60 since they were not affected). Therefore, with the exception of the northeast portion of Parcel No. 5, the SVOC concentrations observed on the ESPA and properties to the north of Parcel No. 5 are apparently due to background influences, including residential uses, previous property owner usage, regional industrial influences, nearby highways and fill material.

- Concentrations of SVOCs decrease with depth, however in the northeast portion of Parcel No. 5, elevated SVOC concentrations extended deeper than in other areas. In the northeast portion of Parcel No. 5 in the 2-3 feet bls interval, higher SVOC concentrations (up to an order of magnitude greater) were observed at ESL-13 through ESL-15 than at other sample locations.

- Outside of the area in the northeast corner of Parcel No. 5 described above (ESL-13 through ESL-15), the only other locations where one or more SVOCs exceeded RSCOs in the 2-3 foot depth interval were near the concrete driveway to the north of Parcel No. 5 at ESL 17 (benzo[a]pyrene only) and ESL-21 (benzo[a]pyrene and benzo[b]fluoranthene only) and at ESL-25 on Parcel No. 4 (benzo[a]pyrene only).

- Elevated concentrations of metals are distributed throughout both parcels of the ESPA and the properties to the north of Parcel No. 5 (which were not purchased after the release at former Tank 60 since they were not affected). There is no apparent pattern to the areal distribution of elevated metals concentrations or exceedances of RSCO, therefore, the metals concentrations in and around the ESPA are apparently due to background influences, including residential uses, previous property owner usage, regional industrial influences, nearby highways and fill material.

- Concentrations of metals generally decreased with depth, however, at least one compound at 11 of the 14 locations sampled had higher concentrations at 2-3 feet bls than at 0-0.5 feet bls. The compounds that were most frequently detected at higher concentrations in the deeper interval compared to the shallow interval were nickel, cadmium, vanadium and thallium. These metals are not contaminants of concern in the product that was released during the former Tank 60 incident, but they are common contaminants found in fill material that is present up to four feet bls throughout the area. The RSCO for chromium, mercury and nickel was exceeded at several locations both on the ESPA and to the north of Parcel No. 5 in the 2-3 foot depth interval.

The following sections provide a more detailed summary of the analytical data.

6.3.1 SVOCs in Soil

Soil samples were collected and sent for laboratory analysis for SVOCs from a total of 6 soil-boring locations (ESL-21 through ESL-26) during the ESPA Investigation Completion. In addition, 12 locations were sampled during the SFI (ESL-1 through ESL-12) and 8 locations were sampled during the SFI Completion (ESL-13 to ESL-20). Samples were collected at up to three depth intervals at each location, as described in Sections 3 and 5.

Shallow Soil Interval (0-0.5 feet below any surface material)

As shown in Plate 1, at least one SVOC was detected in all 26 soil boring locations sampled for SVOCs in the shallow interval during three investigations mentioned above. RSCOs were exceeded for one or more individual SVOCs at each of the 26 locations. The highest SVOC concentrations, and the most exceedances of RSCOs were observed in the portion of Parcel No. 5 identified as being impacted by the release at Tank 60 (northeast corner of Parcel No. 5 at ESL-12 through ESL-15). At these four locations, exceedances of RSCOs were generally an order of magnitude higher than at the other locations. At ESL-8/W-1, only one compound, benzo[a]pyrene, exceeded the RSCO.

Total SVOC concentrations ranged from 1,182 µg/kg at ESL-1/W-8 to 712,800 µg/kg at ESL-12. The RSCO for Total SVOCs of 500,000 µg/kg was exceeded only at ESL-12. The highest Total SVOC concentrations were observed in the portion of Parcel No. 5 identified as being impacted by the release at Tank 60 (northeast corner of Parcel No. 5 at ESL-12 through ESL-15).

As shown on Plate 2, NYSDOH Mean Background levels were exceeded for one or more individual SVOCs at only 10 of the 26 locations sampled (ESL-4, ESL-7, ESL-12 through ESL-15, ESL-19 and ESL-22 through ESL-24). In the portion of Parcel No. 5 identified as being impacted by the release at Tank 60 (northeast corner of Parcel No. 5), Mean Background levels were exceeded for all SVOCs presented on Plate 2. Concentrations of only one compound, dibenzo[a,h]anthracene, exceeded the Mean Background level at four of these ten locations (ESL-4, ESL-7, ESL-19 and ESL-22).

The Mean Background level for Total SVOCs of 30,000 µg/kg (which is an order of magnitude lower than the NYSDEC RSCO) was exceeded at only six of these locations (ESL-12 through ESL-15, ESL-23 and ESL-24). At ESL-23, the Total SVOC concentration of 30,380 µg/kg only slightly exceeded the Mean Background level. The highest Total SVOC concentrations were observed in the portion of Parcel No. 5 identified as being impacted by the release at Tank 60 (northeast corner of Parcel No. 5 at ESL-12 through ESL-15).

Intermediate Soil Interval (1-2 feet below any surface material)

As shown in Plate 1, at least one SVOC was detected in all 8 soil-boring locations sampled in the intermediate interval during the SFI and SFI Completion.

RSCOs were exceeded for one or more individual SVOCs at seven of the eight locations. No RSCOs were exceeded at ESL-19 located in the far northwest corner of parcel No. 5. At ESL-18, benzo[a]pyrene was the only SVOC detected above RSCOs. At ESL-20, dibenzo[a,h]anthracene and benzo[a]pyrene were the only two SVOCs that exceeded RSCOs. The highest SVOC concentrations, and the most exceedances of RSCOs were observed in the portion of Parcel No. 5 identified as being impacted by the release at Tank 60 (northeast corner of Parcel No. 5 at ESL-13 through ESL-15). At these three locations, exceedances of RSCOs were generally an order of magnitude higher than at the other locations.

Total SVOC concentrations ranged from 82 µg/kg at ESL-19 to 189,700 µg/kg at ESL-13. The RSCO for Total SVOCs was not exceeded in any of the samples. The highest Total SVOC concentrations were observed in the portion of Parcel No. 5 identified as being impacted by the release at Tank 60 (northeast corner of Parcel No. 5 at ESL-13 through ESL-15).

Deep Soil Interval (2-3 feet below any surface material)

As shown in Plate 1, at least one SVOC was detected 10 of the 15 soil boring locations sampled in the deep interval during the three investigations. SVOCs were detected at ESL-13 through ESL-17, ESL-20 through ESL-22, ESL-24 and ESL-25.

RSCOs were exceeded for one or more individual SVOCs at six of the ten locations where SVOCs were detected (ESL-13, ESL-14, ESL-15, ESL-17, ESL-21 and ESL-25). The highest

SVOC concentrations, and the most exceedances of RSCOs were observed in the portion of Parcel No. 5 identified as being impacted by the release at Tank 60 (northeast corner of Parcel No. 5 at ESL-13 through ESL-15). At these three locations, exceedances of RSCOs were generally an order of magnitude higher than at the other locations. At ESL-21, benzo[b]fluoranthene and benzo[a]pyrene were the only two SVOCs that exceeded RSCOs. At ESL-17 and ESL-25, benzo[a]pyrene was the only SVOC detected above RSCOs.

Total SVOC concentrations ranged from 95 µg/kg at ESL-20 to 29,680 µg/kg at ESL-13. The RSCO for Total SVOCs was not exceeded in any of the samples. The highest Total SVOC concentrations were observed in the portion of Parcel No. 5 identified as being impacted by the release at Tank 60 (northeast corner of Parcel No. 5 at ESL-13 through ESL-15).

6.3.2 Metals in Soil

Soil samples were collected and sent for laboratory analysis for metals from the same 26 soil boring locations and depth intervals described above for SVOCs during the SFI, SFI Completion and ESPA Investigation Completion. In addition, one composite soil sample (designated SS#1 through SS#4) was analyzed from four groups of five borings collected in the 1-2 foot depth interval (see Figure 3 for locations). The results of the composite borings are presented on Plate 3 in the intermediate sample interval (1-2 foot depth interval).

Shallow Soil Interval (0-0.5 feet below any surface material)

As shown in Plate 3, at least one metal was detected in all 26 soil-boring locations sampled. RSCOs were exceeded for one or more metals at each of the 26 locations.

As shown on Plate 4, NYSDOH Mean Background levels were exceeded for one or more metals at 22 of the 26 locations sampled. Mean Background levels were not exceeded at ESL-2, ESL-5, ESL-6 and ESL-18.

Intermediate Soil Interval (1 to 2 feet below any surface material)

As shown in Plate 3, at least one metal was detected in all eight soil-boring locations sampled during the SFI Completion and ESPA Investigation Completion and the four composite samples collected during the 1993 GTI Site Assessment in the intermediate interval (12 locations total). RSCOs were exceeded for one or more metals at each of the 12 locations.

Deep Soil Interval (2-3 feet below any surface material)

As shown in Plate 3, at least one metal was detected in all 15 soil boring locations sampled in the deep interval during investigations mentioned above. RSCOs were exceeded for one or more metals at 14 of the 15 locations. No RSCOs were exceeded at ESL-22.

7.0 SUMMARY OF MAJOR FINDINGS AND CONCLUSIONS

The ESPA Investigation Completion work conducted on December 14, 2001, coupled with work performed during the 1993 GTI Site assessment, the SFI and SFI completion, has completed the delineation of the impacts resulting from the 1976 release at former Tank 60 on the ESPA and properties to the north of Parcel No. 5.

Following the Tank 60 incident, ExxonMobil purchased property and structures that were impacted by the release. Subsequently, these structures were demolished and debris was disposed offsite. The only area of the ESPA where petroleum-related impacts from the release at former Tank 60 are present is in the northeast portion of Parcel No. 5. The investigation data indicates that other portions of the ESPA have been impacted by industrial and residential background influences.

The property and structures located to the north of Parcel No. 5 were not impacted by the release and therefore were not purchased by ExxonMobil after the incident. The results of the investigations conducted in this area have confirmed that these properties were not impacted by the release, but that they have been impacted by industrial and residential background influences.

This Section includes a summary of the major findings and conclusions of the investigations completed in the ESPA.

7.1 Geology

The Buffalo Terminal is located within the Erie-Ontario Lowland physiographic region of the Interior Plains Division. In general, the region is underlain by Silurian and Devonian age interbedded shales, siltstones, sandstones, limestones and dolomites, dipping approximately 0.50 degrees to the south.

According to data from existing well and soil boring logs from previous investigations, three unconsolidated deposits exist at the ESPA. The first is a fill layer that consists of black cinders, silt, gravel, sand, slag, brick, coal and wood. Fill material commonly contains contaminants, particularly metals. The second unit consists of alluvial deposits of silts, silts and clays, sands, and sands and gravel. The third unit is a gray to brown glacio-lacustrine clay.

Based upon the boring log from ESL-8/ESL-W1, which was completed to a depth of 16 feet bls, the fill layer was approximately two-foot thick and was underlain by a layer of silt and clay from 2-4 feet bls and clay from 4-16 feet bls. Based upon the boring logs from ESL-13 through ESL-26, which were completed to depths up to four feet bls, fill thickness ranged from one foot to four feet. Fill was underlain by silts, sands and gravel intermixed with clay. Bedrock was not encountered in any of the borings installed in the ESPA. The presence of the three unconsolidated deposits is consistent with geologic logs from borings and wells installed on the main portion of the Site south of Elk Street. The presence of the clay layer at approximately four feet bls indicates that the concentrations of SVOCs and metals in soil do not extend below four feet.

7.2 Hydrogeology

The water Table was encountered at approximately five feet below land surface at ESL-8/ ESL-W1 during its installation. No additional depth to water measurements were recorded at this well. This temporary well was abandoned by removing the screen and casing and grouting the hole following the completion of the SFI. Based upon available information, the overburden aquifer in the vicinity of the Site is not used for water supply. Based upon data collected from wells on the main portion of the Site south of Elk Street and west of the Erie-Lackawanna Railroad, the groundwater flow direction is generally southwest toward the Buffalo River.

7.3 Soil Quality

The following is a summary of the major findings regarding soil quality throughout the ESPA and properties to the north of Parcel No. 5:

- No VOCs were detected at one of the three locations (ESL-12) sampled in the 1.5 to 2 foot bls interval. At the other two locations (ESL-4 and ESL-8/W-1) several VOCs were detected in this interval, but none exceeded NYSDEC RSCOs.
- VOCs were not detected at 8-10 feet bls.
- The only area of the ESPA where petroleum-related impacts from the release at former Tank 60 are present is in the northeast portion of Parcel No. 5 (ESL-12, ESL-13, ESL-14 and ESL-15). At these locations, exceedances of RSCOs were generally an order of magnitude higher than at the other locations.

- Concentrations of SVOCs decrease with depth, however in the northeast portion of Parcel No. 5, elevated SVOC concentrations extended deeper than in other areas. In the northeast portion of Parcel No. 5 in the 2-3 feet bls interval, higher SVOC concentrations (up to an order of magnitude greater) were observed at ESL-13 through ESL-15 than at other sample locations.

- Impacts from the incident at former Tank 60, or from background influences, do not extend below an approximate depth of four feet bls, where the clay layer is encountered.

- Outside of the area in the northeast corner of Parcel No. 5 (ESL-13 through ESL-15), the only other locations where one or more SVOCs exceeded RSCOs in the 2-3 foot depth interval were near the concrete driveway to the north of Parcel No. 5 at ESL-17 (benzo[a]pyrene only) and ESL-21 (benzo[a]pyrene and benzo[b]fluoranthene only) and at ESL-25 on Parcel No. 4 (benzo[a]pyrene only).

- There is no apparent pattern to the areal distribution of elevated SVOC concentrations or exceedances of RSCOs across the remainder of Parcel No. 5, Parcel No. 4 or the properties to the north of Parcel No. 5 (which were not purchased after the release at former Tank 60 since they were not affected). Therefore, with the exception of the northeast portion of Parcel No. 5, the SVOC concentrations observed on the ESPA and properties to the north of Parcel No. 5 are apparently due to background influences, including residential uses, previous property owner usage, regional industrial influences, nearby highways and fill material.

- Elevated concentrations of metals are distributed throughout both parcels of the ESPA and the properties to the north of Parcel No. 5 (which were not purchased after the release at former Tank 60 since they were not affected). There is no apparent pattern to the areal distribution of elevated metals concentrations or exceedances of RSCO, therefore, the metals concentrations in and around the ESPA are apparently due to background influences, including residential uses, previous property owner usage, regional industrial influences, nearby highways and fill material.

- Concentrations of metals generally decreased with depth, however, at least one compound at 11 of the 14 locations sampled in the 2-3 feet bls interval had higher concentrations at 2-3 feet bls than at 0-0.5 feet bls. The compounds that were most frequently detected at higher concentrations in the deeper interval compared to the shallow interval were nickel, cadmium, vanadium and thallium. These metals are not contaminants of concern in the product that was released during the former Tank 60 incident, but they are common contaminants found in fill material that is present up to four feet bls throughout the area. The RSCO for chromium, mercury and nickel was exceeded at several locations both on the ESPA and to the north of Parcel No. 5 in the 2-3 foot depth interval.

7.4 Groundwater Quality

Groundwater quality in this area is not a concern based upon the investigation results and the fact that groundwater in the vicinity of the Site is not used for water supply. No significant impacts

to groundwater quality in the ESPA that could be attributed to the incident at former Tank 60 have been observed. The following is a summary of the groundwater quality data collected in the ESPA:

- TPH impact to groundwater was observed at only one out of four locations sampled during the 1993 GTI investigation (TPH = 5.7 µg/L at TWP-03); and
- No VOCs or SVOCs were detected in the groundwater sample collected from ESL-8/ ESL-W1 during the SFI, which was located in the vicinity of the temporary well TWP-03.

7.5 Separate-Phase Product

No separate phase product was detected in any of the ESPA temporary well points.

Respectfully submitted,

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Table 1. Summary of Spills/Releases at the Elk Street Properties Area of the Buffalo Terminal, ExxonMobil Oil Corporation, Buffalo, New York

Date of Incident	Quantity	Product	Cause/Source of Spill	Geographic Area	Media Affected	Agency Notified	Action Taken/Comments	Source	Date Spill Closed by NYSDEC
ELK STREET PROPERTIES AREA (ESPA)									
3/12/1976	Unknown	Cracking Stock	The top of Tank 60 was damaged when hot product from the crude unit contacted ice on the bottom of the tank causing it to expand. Cracking stock for the TCC unit was released to Elk Street and several properties north of Elk Street.	ESPA/NTYA	Soil	Unknown	Mobil cleaned up the cracking stock by vacuuming off excess product and then mixing the remaining material with sand, excavating the material and disposing it off-site. Residences that were impacted were purchased by Mobil and demolished.	Current and/or Former Mobil Employees	NA
2/1/1994	Unknown	Cracking Stock	NYSDEC documentation refers to the "old spill at Elk Street". The incident referred to was the rupture of Tank 60 (cracking stock) in 1976.	ESPA/NTYA	Soil	NYSDEC - #9314016	NYSDEC Spill Report Form noted that additional investigation and possible remediation would be requested and that this spill would be incorporated into spill #8808982. Spill closed by NYSDEC on 1/3/96 as site addressed under consent order.	NYSDEC Spills	1/3/1996

Table 2. Summary of Semivolatile Organic Compounds and Total Petroleum Hydrocarbons Detected in Soil, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter	Sample Designation:	ESL-1	ESL-2	ESL-3	ESL-4	ESL-5	ESL-6	ESL-7	ESL-8/ESL-W1	ESL-8/ESL-W1	ESL-9	ESL-10
	Sample Date:	06/17/98	06/17/98	06/17/98	06/17/98	06/17/98	06/17/98	06/17/98	06/17/98	06/22/98	06/17/98	06/17/98
	Sample Depth (ft bls):	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	8-10	0-0.5	0-0.5
Semivolatile Organic Compounds (Concentrations in µg/kg)												
Acenaphthene		42 J	36 U	34 U	64 J	36 J	37 U	130 J	38 U	42 U	40 U	62 J
Acenaphthylene		58 J	51 J	68 J	120 J	190	160 J	250	38 U	42 U	74 J	78 J
Anthracene		120 J	96 J	110 J	320	230	180 J	470	38 U	42 U	110 J	270
Benzo[a]anthracene		770	380	480	1300	780	410	1700	93 J	42 U	430 J	930
Benzo[a]pyrene		860	410	440	1200	800	400	1700	90 J	42 U	450 J	870
Benzo[b]fluoranthene		1200	530	640	1600	980	570	2100	140 J	42 U	590 J	1000
Benzo[g,h,i]perylene		720	350	330	800	550	280	970	77 J	42 U	390 J	550
Benzo[k]fluoranthene		420	210	230	570	370	180 J	760	45 J	42 U	200 J	410
Chrysene		850	430	450	1300	840	470	1800	110 J	42 U	550 J	850
Dibenzo[a,h]anthracene		170 J	120 J	99 J	280	170 J	82 J	300	38 U	42 U	120 J	170 J
Fluoranthene		1700	740	790	2500	1300	680	3500	120 J	42 U	760 J	1700
Fluorene		38 J	36 U	34 U	100 J	59 J	45 J	150 J	38 U	42 U	40 U	70 J
Indeno[1,2,3-cd]pyrene		780	340	400	900	610	300	1100	77 J	42 U	360 J	610
Naphthalene		38 U	36 U	34 U	100 J	35 U	110 J	84 J	160 J	42 U	40 U	74 J
Phenanthrene		970	400	240	1400	530	430	2000	140 J	42 U	410 J	890
Pyrene		1400	610	650	1900	1200	610	2800	130 J	42 U	670 J	1400
	Total SVOCs:	10098	4667	4927	14454	8645	4907	19814	1182	0	5114	9934
Total Petroleum Hydrocarbons (Lubricating Oil) (Concentrations in mg/kg)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

NA - Not analyzed
U - Not Detected
J - Estimated concentration
µg/kg - Micrograms per kilogram
mg/kg - Milligrams per kilogram
SVOCs - Semivolatile Organic Compounds
ft bls - Feet below land surface
TPH - Total Petroleum Hydrocarbons

1. SS#1 through SS#4 are composite samples collected during 1993 GTI Site Assessment; ESL-1 through ESL-12 were collected during 1998 Site Facility Investigation (SFI); ESL-13 through ESL-20 were collected during 1999 SFI Completion; and ESL-21 through ESL-26 were collected during 2001 ESPA Investigation Completion.

Table 2. Summary of Semivolatile Organic Compounds and Total Petroleum Hydrocarbons Detected in Soil, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter	Sample Designation:	ESL-11	ESL-12	ESL-13	ESL-13	ESL-13	ESL-14	ESL-14	ESL-14	ESL-15	ESL-15	ESL-15	ESL-16
	Sample Date:	06/17/98	06/17/98	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99
	Sample Depth (ft bls):	0-0.5	0-0.5	0-0.5	1-2	2-3	0-0.5	1-2	2-3	0-0.5	1-2	2-3	0-0.5
Semivolatile Organic Compounds (Concentrations in µg/kg)													
Acenaphthene		64 J	5300	1700	2100	350	760	1600	61	3400	950	170	49
Acenaphthylene		110 J	2500	940	1100	220	400 U	480	42 U	410	500	110	110
Anthracene		220	21000	5500	5500	1100	2200	5100	140	7400	2600	580	190
Benzo[a]anthracene		760	69000	16000	16000	2500	6800	7700	510	18000	6700	2200	710
Benzo[a]pyrene		710	57000	13000	14000	2300	7000	6900	570	13000	5500	1800	750
Benzo[b]fluoranthene		940	63000	15000	17000	2900	7600	8900	740	14000	7200	2200	1000
Benzo[g,h,i]perylene		520	30000	6500	5200	1000	4500	2400	440	4200	3200	910	600
Benzo[k]fluoranthene		310	26000	6300	5700	1200	3500	3800	260	13000	3700	940	330
Chrysene		800	59000	16000	16000	2600	6900	7800	560	20000	7200	2300	910
Dibenzo[a,h]anthracene		150 J	9200 J	2400	1700	340	1400	990	130	2500	1000	330	180
Fluoranthene		1600	140000	29000	35000	4700	12000	16000	940	30000	15000	3900	1400
Fluorene		79 J	5600	2100	3100	540	830	3300	120	3400	1400	180	74
Indeno[1,2,3-cd]pyrene		520	35000	8200	10000	1300	5100	3300	470	5200	3600	1100	630
Naphthalene		76 J	1200	720	2300	330	400 U	1200	47	1700	600	90	100
Phenanthrene		1000	69000	18000	26000	3800	7300	18000	530	25000	11000	1600	790
Pyrene		1300	120000	28000	29000	4500	12000	13000	820	33000	13000	3500	1300
	Total SVOCs:	9159	712800	169360	189700	29680	77890	100470	6338	194210	83150	21910	9123
Total Petroleum Hydrocarbons (Lubricating Oil) (Concentrations in mg/kg)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

NA - Not analyzed
U - Not Detected
J - Estimated concentration
µg/kg - Micrograms per kilogram
mg/kg - Milligrams per kilogram
SVOCs - Semivolatile Organic Compounds
ft bls - Feet below land surface
TPH - Total Petroleum Hydrocarbons

1. SS#1 through SS#4 are composite samples collected during 1993 GTI Site Assessment; ESL-1 through ESL-12 were collected during 1998 Site Facility Investigation (SFI); ESL-13 through ESL-20 were collected during 1999 SFI Completion; and ESL-21 through ESL-26 were collected during 2001 ESPA Investigation Completion.

Table 2. Summary of Semivolatile Organic Compounds and Total Petroleum Hydrocarbons Detected in Soil, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter	Sample Designation:	ESL-16	ESL-16	ESL-17	ESL-17	ESL-17	ESL-18	ESL-18	ESL-18	ESL-19	ESL-19	ESL-19	ESL-20
	Sample Date:	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99
	Sample Depth (ft bls):	1-2	2-3	0-0.5	1-2	2-3	0-0.5	1-2	2-3	0-0.5	1-2	2-3	0-0.5
Semivolatile Organic Compounds (Concentrations in µg/kg)													
Acenaphthene		36 U	37 U	110	150	37 U	36 U	38 U	38 U	55	39 U	39 U	41 U
Acenaphthylene		53	37 U	160	300	37 U	36 U	38 U	38 U	130	39 U	39 U	53
Anthracene		110	37 U	340	510	66	44	38 U	38 U	300	39 U	39 U	110
Benzo[a]anthracene		310	37 U	1100	2000	150	180	110	38 U	1400	39 U	39 U	490
Benzo[a]pyrene		320	53	1100	1800	130	250	130	38 U	1300	39 U	39 U	420
Benzo[b]fluoranthene		400	64	1400	2200	130	230	120	38 U	1500	39 U	39 U	560
Benzo[g,h,i]perylene		290	49	810	1100	73	250	96	38 U	1000	39 U	39 U	400
Benzo[k]fluoranthene		140	37 U	610	970	50	74	55	38 U	1200	39 U	39 U	410
Chrysene		390	45	1300	2200	180	200	120	38 U	1800	39 U	39 U	630
Dibenzo[a,h]anthracene		96	37 U	250	380	37 U	74	38 U	38 U	530	39 U	39 U	190
Fluoranthene		670	65	2200	3200	260	280	150	38 U	2100	40	39 U	650
Fluorene		52	37 U	110	170	37 U	36 U	38 U	38 U	100	39 U	39 U	41 U
Indeno[1,2,3-cd]pyrene		290	43	940	1300	69	160	84	38 U	910	39 U	39 U	350
Naphthalene		58	37 U	52	78	37 U	36 U	38 U	38 U	42	39 U	39 U	41 U
Phenanthrene		510	43	1400	1800	350	160	45	38 U	1400	39 U	39 U	450
Pyrene		610	60	1900	2900	340	270	140	38 U	2500	42	39 U	1000
	Total SVOCs:	4299	422	13782	21058	1798	2172	1050	0	16267	82	0	5713
Total Petroleum Hydrocarbons (Lubricating Oil) (Concentrations in mg/kg)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

NA - Not analyzed
U - Not Detected
J - Estimated concentration
µg/kg - Micrograms per kilogram
mg/kg - Milligrams per kilogram
SVOCs - Semivolatile Organic Compounds
ft bls - Feet below land surface
TPH - Total Petroleum Hydrocarbons

1. SS#1 through SS#4 are composite samples collected during 1993 GTI Site Assessment; ESL-1 through ESL-12 were collected during 1998 Site Facility Investigation (SFI); ESL-13 through ESL-20 were collected during 1999 SFI Completion; and ESL-21 through ESL-26 were collected during 2001 ESPA Investigation Completion.

Table 2. Summary of Semivolatile Organic Compounds and Total Petroleum Hydrocarbons Detected in Soil, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter	Sample Designation:	ESL-20	ESL-20	ESL-21	ESL-21	ESL-22	ESL-22	ESL-23	ESL-23	ESL-24	ESL-24	ESL-25	ESL-25 DUP
	Sample Date:	09/02/99	09/02/99	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01
	Sample Depth (ft bls):	1-2	2-3	0-0.5	2-3	0-0.5	2-3	0-0.5	2-3	0-0.5	2-3	0-0.5	0-0.5
Semivolatile Organic Compounds (Concentrations in µg/kg)													
Acenaphthene		42 U	40 U	41 U	44 U	230 U	37 U	220 U	40 U	480	39 U	40 U	40 U
Acenaphthylene		42 U	40 U										
Anthracene		42 U	40 U	180 J	67 J	550 J	37 U	600 J	40 U	2200	39 U	130 J	210 J
Benzo[a]anthracene		120	40 U	610	220 J	1500 J	37 U	2600	40 U	6800	39 U	620	830
Benzo[a]pyrene		170	40 U	630	230 J	1600 J	37 U	2900	40 U	7400	39 U	740	860
Benzo[b]fluoranthene		130	50	900	310 J	2000 J	40 J	3700	40 U	9100	39 U	1000	1300
Benzo[g,h,i]perylene		150	40 U	300 J	110 J	820 J	37 U	1600 J	40 U	3100	39 U	400	720
Benzo[k]fluoranthene		100	40 U	390 J	150 J	800 J	37 U	1600 J	40 U	3700	39 U	440	630
Chrysene		170	40 U	620	270 J	1500 J	37 U	2900	40 U	8700	39 U	790	1000
Dibenzo[a,h]anthracene		42	40 U	110 J	44 U	290 J	37 U	580 J	40 U	1000	39 U	160 J	230 J
Fluoranthene		110	40 U	1200	440 J	3400	48 J	5000	40 U	17000	74 J	1000	1600
Fluorene		42 U	40 U	51 J	44 U	230 U	37 U	220 U	40 U	860	39 U	40 U	51 J
Indeno[1,2,3-cd]pyrene		93	40 U	350 J	140 J	930 J	37 U	1900 J	40 U	3600	39 U	450	710
Naphthalene		42 U	40 U	41 U	44 U	230 U	37 U	220 U	40 U	700	39 U	56 J	69 J
Phenanthrene		79	40 U	760	290 J	2500	37 U	2100 J	40 U	14000	54 J	520	770
Pyrene		200	45	1200	380 J	3000	44 J	4900	40 U	16000	73 J	1100	1400
	Total SVOCs:	1364	95	7301	2607	18890	132	30380	0	94640	201	7406	10380
Total Petroleum Hydrocarbons (Lubricating Oil) (Concentrations in mg/kg)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

NA - Not analyzed
U - Not Detected
J - Estimated concentration
µg/kg - Micrograms per kilogram
mg/kg - Milligrams per kilogram
SVOCs - Semivolatile Organic Compounds
ft bls - Feet below land surface
TPH - Total Petroleum Hydrocarbons

1. SS#1 through SS#4 are composite samples collected during 1993 GTI Site Assessment; ESL-1 through ESL-12 were collected during 1998 Site Facility Investigation (SFI); ESL-13 through ESL-20 were collected during 1999 SFI Completion; and ESL-21 through ESL-26 were collected during 2001 ESPA Investigation Completion.

Table 2. Summary of Semivolatile Organic Compounds and Total Petroleum Hydrocarbons Detected in Soil, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter	Sample Designation:	ESL-25	ESL-26	ESL-26	SS#1	SS#2	SS#3	SS#4
	Sample Date:	12/14/01	12/14/01	12/14/01	10/07/93	10/08/93	10/08/93	10/08/93
	Sample Depth (ft bls):	2-3	0-0.5	2-3	1-2	1-2	1-2	1-2
Semivolatile Organic Compounds (Concentrations in µg/kg)								
Acenaphthene		45 U	38 U	39 U	NA	NA	NA	NA
Acenaphthylene					NA	NA	NA	NA
Anthracene		45 U	73 J	39 U	NA	NA	NA	NA
Benzo[a]anthracene		92 J	400	39 U	NA	NA	NA	NA
Benzo[a]pyrene		100 J	470	39 U	NA	NA	NA	NA
Benzo[b]fluoranthene		140 J	700	39 U	NA	NA	NA	NA
Benzo[g,h,i]perylene		65 J	310 J	39 U	NA	NA	NA	NA
Benzo[k]fluoranthene		54 J	260 J	39 U	NA	NA	NA	NA
Chrysene		130 J	500	39 U	NA	NA	NA	NA
Dibenzo[a,h]anthracene		45 U	110 J	39 U	NA	NA	NA	NA
Fluoranthene		180 J	740	39 U	NA	NA	NA	NA
Fluorene		45 U	38 U	39 U	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene		63 J	350 J	39 U	NA	NA	NA	NA
Naphthalene		45 U	54 J	39 U	NA	NA	NA	NA
Phenanthrene		130 J	430	39 U	NA	NA	NA	NA
Pyrene		190 J	720	39 U	NA	NA	NA	NA
	Total SVOCs:	1144	5117	0	NA	NA	NA	NA
Total Petroleum Hydrocarbons (Lubricating Oil) (Concentrations in mg/kg)		NA	NA	NA	300	180	7200	2600

Notes:

NA - Not analyzed
U - Not Detected
J - Estimated concentration
µg/kg - Micrograms per kilogram
mg/kg - Milligrams per kilogram
SVOCs - Semivolatile Organic Compounds
ft bls - Feet below land surface
TPH - Total Petroleum Hydrocarbons

1. SS#1 through SS#4 are composite samples collected during 1993 GTI Site Assessment; ESL-1 through ESL-12 were collected during 1998 Site Facility Investigation (SFI); ESL-13 through ESL-20 were collected during 1999 SFI Completion; and ESL-21 through ESL-26 were collected during 2001 ESPA Investigation Completion.

Table 3. Summary of Metals and Chloride Detected in Soil, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter (Concentrations in mg/kg)	Sample Designation:	ESL-1	ESL-2	ESL-3	ESL-4	ESL-5	ESL-6	ESL-7	ESL-8/ESL-W1	ESL-8/ESL-W1	ESL-9
	Sample Date:	06/17/98	06/17/98	06/17/98	06/17/98	06/17/98	06/17/98	06/17/98	06/17/98	06/22/98	06/17/98
	Sample Depth (ft bls):	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	8-10	0-0.5
Arsenic		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium		1.81	1.04	0.36	0.96	0.92	1.31	2.7	1.76	3.8 J	1.36
Chloride		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium		838	15.9	73.7	15.3	35.5	24.8	32.6	26.6	19.4 J	14.9
Lead		85.6	129	25.7	333	130	232	723	324	11.9 J	169
Mercury		0.0755	0.33	0.0381	0.38	0.18	0.0257	1.38	0.0658	0.0202	0.31
Nickel		12	20.1	7.8	13.1	16.9	12.4	27	15.7	35.6	16.6
Selenium		1.4	0.41	0.37 U	1.2	0.39 U	1.02	1.8	1.7	0.46 UJ	1.2
Silver		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium		12.9	1.39	1.94	1.1	1.43	1.97	1.77	1.54	2.01	0.92
Vanadium		300	15.3	27.7	15.5	22.7	18.9	28.4	27.6	21.7	18.2

Notes:

NA - Not analyzed
U - Not Detected
J - Estimated concentration
mg/kg - Milligrams per kilogram
ft bls - Feet below land surface

1. SS#1 through SS#4 are composite samples collected during 1993 GTI Site Assessment; ESL-1 through ESL-12 were collected during 1998 Site Facility Investigation (SFI); ESL-13 through ESL-20 were collected during 1999 SFI Completion; and ESL-21 through ESL-26 were collected during 2001 ESPA Investigation Completion.

Table 3. Summary of Metals and Chloride Detected in Soil, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter (Concentrations in mg/kg)	Sample Designation:	ESL-10	ESL-11	ESL-12	ESL-13	ESL-13	ESL-13	ESL-14	ESL-14	ESL-14	ESL-15	ESL-15	ESL-15
	Sample Date:	06/17/98	06/17/98	06/17/98	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99
	Sample Depth (ft bls):	0-0.5	0-0.5	0-0.5	0-0.5	1-2	2-3	0-0.5	1-2	2-3	0-0.5	1-2	2-3
Arsenic		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium		1.49	9.7	2.6	0.056 U	0.06 U	0.057 U	0.061 U	0.065 U	0.52	2.64	0.06 U	0.058 U
Chloride		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium		22.6	32.7	21.1	31.2	22.8	30.1	28.1	24.4	14.7	27.1	24.7	14.9
Lead		214	625	164	1410	533	44.2	652	1620	491	704	514	324
Mercury		0.57	2.04	0.6	2.54	0.41	0.0998	1.56	0.83	0.0983	1.59	1.09	0.13
Nickel		22.8	31.8	29.6	23.6	18.2	35	24.3	23.3	13	18	20.5	16.5
Selenium		0.47	2.1	0.6	5.2	2.8	0.46 U	1.4	3.6	0.5 U	0.47	2.9	0.47 U
Silver		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium		2.6	2.3	4.2	0.75 U	2.4	2.3	0.81 U	3.6	0.83 U	0.75 U	1.96	1.37
Vanadium		37.8	26.4	18.3	32	29.4	34	58.6	35.5	17.9	41.6	29.3	25.5

Notes:

NA - Not analyzed
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mg/kg - Milligrams per kilogram
ft bls - Feet below land surface

1. SS#1 through SS#4 are composite sa
collected during 1993 GTI Site Asse
ESL-1 through ESL-12 were collecte
during 1998 Site Facility Investigatic
ESL-13 through ESL-20 were collec
1999 SFI Completion; and ESL-21 th
ESL-26 were collected during 2001 I
Investigation Completion.

Table 3. Summary of Metals and Chloride Detected in Soil, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter (Concentrations in mg/kg)	Sample Designation:	ESL-16	ESL-16	ESL-16	ESL-17	ESL-17	ESL-17	ESL-18	ESL-18	ESL-18	ESL-19	ESL-19	ESL-19
	Sample Date:	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99	09/02/99
	Sample Depth (ft bls):	0-0.5	1-2	2-3	0-0.5	1-2	2-3	0-0.5	1-2	2-3	0-0.5	1-2	2-3
Arsenic		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium		4.94	0.056 U	0.054 U	0.28 U	0.058 U	0.055 U	2.3	0.058 U	0.057 U	6.89	0.058 U	0.059 U
Chloride		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium		26.7	16.1	18.2	87.3	32.8	14.7	14.5	19.4	20.1	119	24.6	25.4
Lead		449	261	30.3	552	294	16.5	112	33.5	31.1	1610	27.1	34
Mercury		0.71	0.92	0.0676	0.82	0.45	0.025	0.12	0.0589	0.0339	1.41	0.0778	0.0391
Nickel		30.4	16.3	27.8	41	31.5	23.4	17.2	22.8	33.6	24.2	27.2	35.1
Selenium		1.5	1.2	0.44 U	10.2	4.4	0.44 U	0.5	1.12	0.46 U	2	0.47 U	0.47 U
Silver		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium		0.74 U	1.08	1.6	36	4.8	1.02	0.73 U	1.51	0.76 U	0.8 U	0.96	1.5
Vanadium		32.9	20.3	24.5	88	30.6	18.7	19.1	27.2	24.4	47.1	26.6	27.9

Notes:

NA - Not analyzed
U - Not Detected
J - Estimated concentration
mg/kg - Milligrams per kilogram
ft bls - Feet below land surface

1. SS#1 through SS#4 are composite sa
collected during 1993 GTI Site Asse
ESL-1 through ESL-12 were collecte
during 1998 Site Facility Investigatic
ESL-13 through ESL-20 were collec
1999 SFI Completion; and ESL-21 th
ESL-26 were collected during 2001 I
Investigation Completion.

Table 3. Summary of Metals and Chloride Detected in Soil, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter (Concentrations in mg/kg)	Sample Designation:	ESL-20	ESL-20	ESL-20	ESL-21	ESL-21	ESL-22	ESL-22	ESL-23	ESL-23	ESL-24	ESL-24	ESL-25
	Sample Date:	09/02/99	09/02/99	09/02/99	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01	12/14/01
	Sample Depth (ft bls):	0-0.5	1-2	2-3	0-0.5	2-3	0-0.5	2-3	0-0.5	2-3	0-0.5	2-3	0-0.5
Arsenic		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium		0.62 U	0.64	0.062 U	1.3 J	0.55 J	1.4 J	0.062 U	0.58 J	0.066 U	3.8	0.065 U	2.6
Chloride		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium		985	197	57.2	21.3	20.7	28.9	9.1	2040	25.8	161	13.7	37.1
Lead		676	134	48.1	495	321	1000	33.8	298	20.4	1970	16.2	118
Mercury		0.91	0.27	0.0356	0.51	0.51	1.3	0.041 J	0.15	0.019 J	0.45	0.02 J	0.65
Nickel		28.7	21.4	35.8	51.7	16	24.6	11	48.6	36.8	36.8	10.1	21.1
Selenium		5 U	1.3	0.5 U	0.96 J	1.9	2	0.54 U	3.1 U	0.85 J	6.3	0.57 U	1.1 J
Silver		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium		13.5	3	2.04	1 U	1.1 U	1.1 U	0.96 U	5.4 U	1 U	1 U	1 U	1 U
Vanadium		266	72.1	38.7	27.7	29.7	30	18.7	423	34.7	94.8	26.2	24.4

Notes:

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mg/kg - Milligrams per kilogram
ft bls - Feet below land surface

1. SS#1 through SS#4 are composite sa
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ESL-1 through ESL-12 were collecte
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ESL-26 were collected during 2001 I
Investigation Completion.

Table 3. Summary of Metals and Chloride Detected in Soil, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter (Concentrations in mg/kg)	Sample Designation:	ESL-25 DUP	ESL-25	ESL-26	ESL-26	SS#1	SS#2	SS#3	SS#4
	Sample Date:	12/14/01	12/14/01	12/14/01	12/14/01	10/07/93	10/08/93	10/08/93	10/08/93
	Sample Depth (ft bls):	0-0.5	2-3	0-0.5	2-3	1-2	1-2	1-2	1-2
Arsenic		NA	NA	NA	NA	17	18	42	12
Barium		NA	NA	NA	NA	260	150	310	190
Cadmium		3.9	0.21 J	0.37 J	0.063 U	3.1 U	0.94	2.1	3.1 U
Chloride		NA	NA	NA	NA	1200 U	1200 U	1400 U	1200 U
Chromium		56.4	14.6	92.6	17.2	57	21	29	20
Lead		278	47	156	17.4	1200	530	1300	550
Mercury		1.2	0.16	0.099 J	0.037 J	0.12U	0.88	2	1.7
Nickel		22.1	10.9	17	19.9	NA	NA	NA	NA
Selenium		1.2 J	0.8 J	1.8	0.71 J	0.62 U	1	1.1	0.86
Silver		NA	NA	NA	NA	6.2 U	1.2 U	1.8	6.2 U
Thallium		1 U	1.1 U	0.98 U	0.98 U	NA	NA	NA	NA
Vanadium		38.2	23.2	49	36.9	NA	NA	NA	NA

Notes:

NA - Not analyzed
U - Not Detected
J - Estimated concentration
mg/kg - Milligrams per kilogram
ft bls - Feet below land surface

1. SS#1 through SS#4 are composite sa
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ESL-1 through ESL-12 were collecte
during 1998 Site Facility Investigatic
ESL-13 through ESL-20 were collec
1999 SFI Completion; and ESL-21 th
ESL-26 were collected during 2001 I
Investigation Completion.

Table 4. Summary of Volatile Organic Compounds Detected in Soil, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter (Concentrations in µg/kg)	**Sample Designation:** / **Sample Date:** / **Sample Depth (ft bls):**	ESL-4 06/22/98 1.5-2	ESL-8/ESL-W1 06/22/98 1.5-2	ESL-8/ESL-W1 06/22/98 8-10	ESL-12 06/22/98 1.5-2
Benzene		5.5 U	5 U	5 U	5.2 U
Toluene		18 J	9.1 J	5 U	5.2 U
Ethylbenzene		7.2 J	8.5 J	5 U	5.2 U
Xylenes (total)		35 J	24	10 U	10 U
Total BTEX:		60.2	41.6	0	0
1,2,4-Trimethylbenzene		29 J	27	5 U	5.2 U
1,3,5-Trimethylbenzene		7.9 J	6.3 J	5 U	5.2 U
Isopropylbenzene		7.5 J	5 U	5 U	5.2 U
MTBE		5.5 U	5 U	5 U	5.2 U
n-Butylbenzene		8.2 J	12 J	5 U	5.2 U
n-Propylbenzene		8 J	7.1 J	5 U	5.2 U
Naphthalene		51 UJ	42	5 U	12 U
p-Isopropyltoluene		5.5 U	6.9 J	5 U	5.2 U
sec-Butylbenzene		5.6 J	5 U	5 U	5.2 U
tert-Butylbenzene		5.5 U	5 U	5 U	5.2 U
	Total VOCs:	126.4	142.9	0	0

Notes:

U - Not Detected
J - Estimated concentration
µg/kg - Micrograms per kilogram
ft bls - Feet below land surface
VOCs - Volatile Organic Compounds

1. SS#1 through SS#4 are composite samples collected during 1993 GTI Site Assessment; ESL-1 through ESL-12 were collected during 1998 Site Facility Investigation (SFI); ESL-13 through ESL-20 were collected during 1999 SFI Completion; and ESL-21 through ESL-26 were collected during 2001 ESPA Investigation Completion.

Table 5. Comparison of NYSDEC RSCOs to NYSDOH Mean Background Levels for Shallow Soil, ExxonMobil Corporation, Buffalo Terminal, Buffalo, New York.

Analyte	NYSDEC RSCO	NYSDOH Mean Background
SVOCs (ug/kg)		
Benzo[a]anthracene	224	2,400
Benzo[a]pyrene	61	2,300
Benzo[b]fluoranthene	220	2,400
Benzo[k]fluoranthene	220	2,300
Chrysene	400	2,900
Dibenzo[a,h]anthracene	14	270
Fluoranthene	50,000	5,000
Indeno[1,2,3-cd]pyrene	3,200	1,900
Phenanthrene	50,000	3,000
Pyrene	50,000	4,500
Total SVOCs	500,000	30,000
Metals (mg/kg)		
Cadmium	1	4
Chromium	10	54
Lead	500(1)	728
Mercury	0.1	0.4
Nickel	13	37
Selenium	2	1.1
Vanadium	150	37

Note: (1) NYSDEC RSCO for lead (500 mg/kg) is based on a range of avarage background levels in metropolitan or suburban areas near highways of 200-500 mg/kg (Source: NYSDEC TAGM 4046)

NYSDEC RSCO = New York State Department of Environmental Conservation Recommended Soil Cleanup Objective
NYSDOH = New York State Department of Health
SVOC = Semivolatile Organic Compound
ug/kg = microgram per kilogram
mg/kg = milligram per kilogram

Table 6. Summary of Semivolatile Organic Compounds and TPH Detected in Groundwater, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter	Sample Designation: / Sample Date:	ESL-8/ESL-W1 07/08/98	TWP#2 10/12/93	TWP#3 10/12/93	TWP#4 10/12/93	TWP#5 10/12/93
Semivolatile Organic Compounds (Concentrations in µg/L)						
Acenaphthene		1 U	NA	NA	NA	NA
Acenaphthylene		1 U	NA	NA	NA	NA
Anthracene		1 U	NA	NA	NA	NA
Benzo[a]anthracene		1 U	NA	NA	NA	NA
Benzo[a]pyrene		1 U	NA	NA	NA	NA
Benzo[b]fluoranthene		1 U	NA	NA	NA	NA
Benzo[g,h,i]perylene		1 U	NA	NA	NA	NA
Benzo[k]fluoranthene		1 U	NA	NA	NA	NA
Chrysene		1 U	NA	NA	NA	NA
Dibenzo[a,h]anthracene		1 U	NA	NA	NA	NA
Fluoranthene		1 U	NA	NA	NA	NA
Fluorene		1 U	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene		1 U	NA	NA	NA	NA
Naphthalene		1 U	NA	NA	NA	NA
Phenanthrene		1 U	NA	NA	NA	NA
Pyrene		1 U	NA	NA	NA	NA
	Total SVOCs:	0	NA	NA	NA	NA
Total Petroleum Hydrocarbons (Lubricating Oil) (Concentrations in µg/L)		NA	52 U	5700	50 U	62 U

Notes:

NA - Not analyzed
U - Not Detected
J - Estimated concentration
µg/L - Micrograms per liter
SVOCs - Semivolatile Organic Compounds
TPH - Total Petroleum Hydrocarbons

1. SS#1 through SS#4 are composite samples collected during 1993 GTI Site Assessment; ESL-1 through ESL-12 were collected during 1998 Site Facility Investigation (SFI); ESL-13 through ESL-20 were collected during 1999 SFI Completion; and ESL-21 through ESL-26 were collected during 2001 ESPA Investigation Completion.

Table 7. Summary of Volatile Organic Compounds Detected in Groundwater, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

Parameter (Concentrations in µg/L)	**Sample Designation:** ESL-8/ESL-W1 **Sample Date:** 07/08/98
Volatile Organic Compounds (Concentrations in µg/L)	
1,2,4-Trimethylbenzene	0.2 U
1,3,5-Trimethylbenzene	0.2 U
Benzene	0.2 U
Ethylbenzene	0.2 U
Isopropylbenzene	0.2 U
MTBE	0.2 U
Naphthalene	0.2 U
n-Butylbenzene	0.2 U
n-Propylbenzene	0.2 U
p-Isopropyltoluene	0.2 U
sec-Butylbenzene	0.2 U
tert-Butylbenzene	0.2 U
Toluene	0.2 U
Xylenes (total)	0.4 U

Notes:

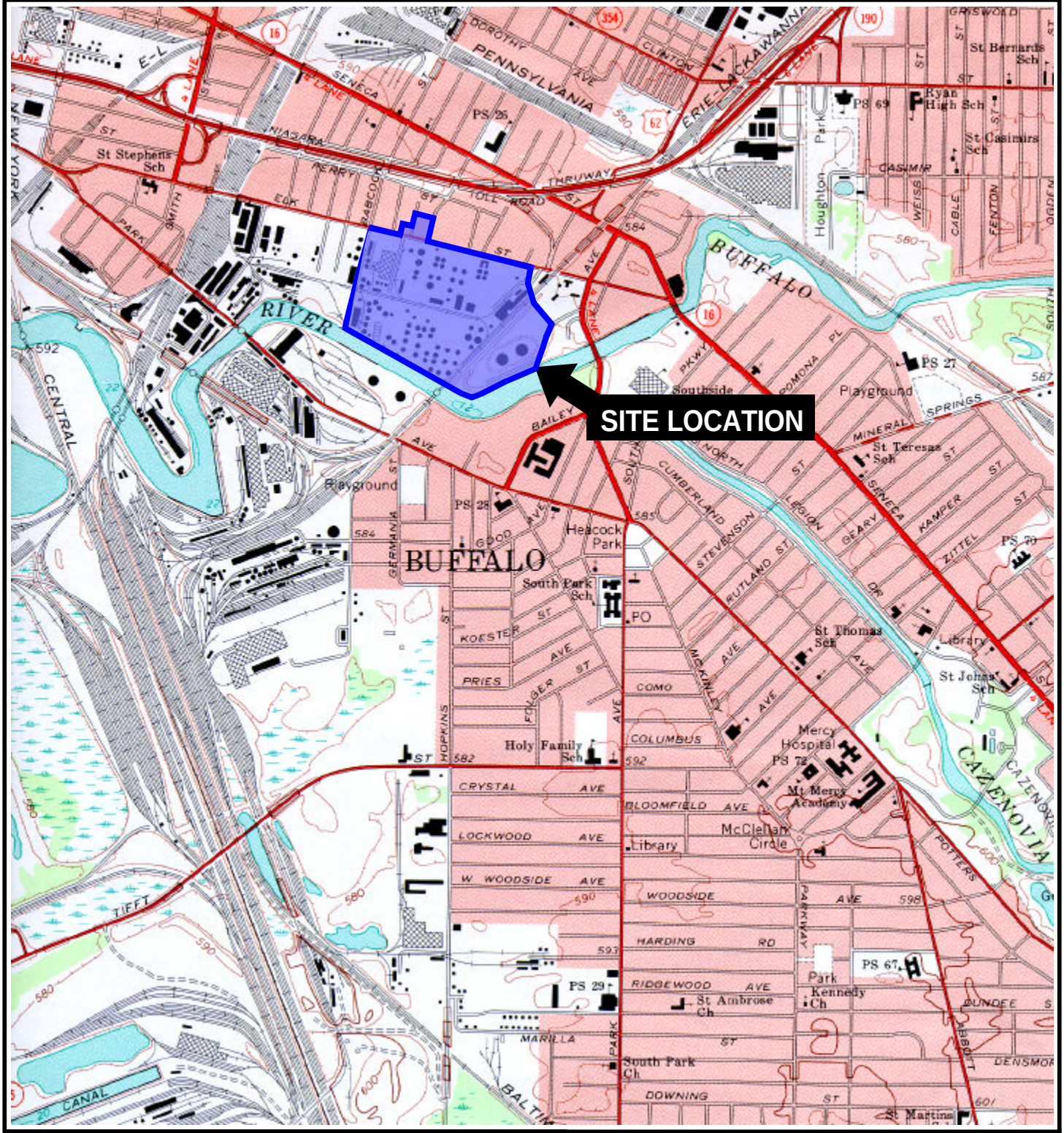
U - Not Detected
µg/L - Micrograms per liter
VOCs - Semivolatile Organic Compounds
1. SS#1 through SS#4 are composite samples collected during 1993 GTI Site Assessment; ESL-1 through ESL-12 were collected during 1998 Site Facility Investigation (SFI); ESL-13 through ESL-20 were collected during 1999 SFI Completion; and ESL-21 through ESL-26 were collected during 2001 ESPA Investigation Completion.

Table 8. Summary of Metals and Chloride Detected in Groundwater, ExxonMobil Oil Corporation, Buffalo Terminal, Buffalo, New York.

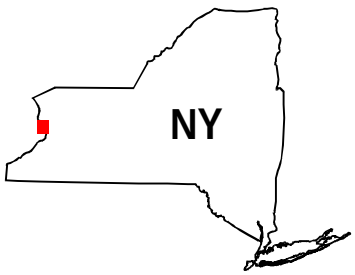
Parameter (Concentrations in µg/L)	**Sample Designation:** / **Sample Date:**	TWP#1 10/12/93	TWP#2 10/12/93	TWP#3 10/12/93	TWP#4 10/12/93	TWP#5 10/12/93
Arsenic		NA	42	47	30	63
Barium		NA	350	360	420	1000 U
Cadmium		NA	5 U	6	5 U	25 U
Chromium		NA	78	52	60	110
Lead		NA	210	2000	120	320
Mercury		NA	0.29 U	0.2 U	0.29 U	0.29 U
Selenium		NA	16	7.4	13	19
Silver		NA	10 U	10 U	10 U	50 U
Chloride (mg/L)		370	37	20 U	20 U	130

Notes:

NA - Not analyzed
U - Not Detected
J - Estimated concentration
µg/L - Micrograms per liter
mg/L - Milligrams per liter
NA - Not analyzed



QUADRANGLE LOCATION



N

0 2000’

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

Title:

SITE LOCATION MAP

BUFFALO TERMINAL

Prepared for:

EXXONMOBIL OIL CORPORATION

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: N.C.		Date: 12MAR02	FIGURE
Prepared by: R.K.		Scale: AS SHOWN	1
Project Mgr.: N.C.		Office: NY	
File No.: MC5218001.CDR		Project No.: 17252Y04	

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ELK STREET PROPERTIES AREA

BABCOCK STREET

PARCELS #1, #2 AND #3

GORHAM STREET

PARCEL #4

WINONA STREET

PARCEL #5

BRADFORD STREET

ELK STREET

BABCOCK STREET

NORTHEAST PROCESS AND STORAGE AREA

NORTHERN TANK YARD AREA

FORMER REFINERY AREA

ADMINISTRATIVE OFFICES AND OPERATIONS AREA

CENTRAL RAIL AND PROCESS AREA

BABCOCK STREET PROPERTIES AREA

75

25

26

90

99

38

97

171

87

104

105

SOUTHERN TANK YARD AREA

175

176

EASTERN TANK YARD AREA (FORMER DISPOSAL AREA)

BUFFALO RIVER

BUFFALO RIVER

N

LEGEND

- EXISTING TANK
- EXISTING STRUCTURE
- CURRENT PROPERTY LINE (BASED ON DENLUCK–O'NEILL ENGINEERING AND SURVEYING, DEC. 15, 1988; AND NUSSBAUMER & CLARKE, INC. FEBRUARY 6, 1995)
- LIMITS OF PROPERTY FORMERLY OWNED BY EXXONMOBIL OIL CORPORATION
- GEOGRAPHIC AREA BOUNDARY AND/OR FORMER PROPERTY LINES

250' 0 250'

Title:

GEOGRAPHIC AREAS OF THE BUFFALO TERMINAL

BUFFALO TERMINAL, BUFFALO, NEW YORK

Prepared For:

EXXONMOBIL OIL CORPORATION

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: N.C.	Date: 12MAR02	FIGURE
Prepared by: R.K.	Scale: AS SHOWN	2
Project Mgr: N.C.	Office: NY	
File No: MC5218002	Project: 17252Y04	

N:\PROJECTS\MC172Y\MC52Y\180\MC5218002.DWG

MC172Y\MC52Y\180\MC5218003.DWG

LEGEND

ESL-3 ● LOCATION AND DESIGNATION OF SFI/ SFI COMPLETION SOIL BORING

SS#1C/TWP-05 ○ ○ ○ ○ LOCATION OF 1993 GTI SITE ASSESSMENT INVESTIGATION COMPOSITE SOIL BORINGS SS#1 THROUGH SS#4 (ONE COMPOSITE SAMPLE FROM EACH GROUP OF FIVE BORINGS, GROUPS ARE SHOWN AS FOUR DIFFERENT COLORS; TWP INDICATES TEMPORARY WELL POINT GROUNDWATER SAMPLING LOCATION)

⊕ ESPA INVESTIGATION COMPLETION SOIL SAMPLING LOCATION

SFI SITE FACILITY INVESTIGATION

FORMER PROPERTY DIVISIONS

EXXONMOBIL PROPERTY LINE

ESPA BOUNDARY

BUILDINGS PRESENT AT TIME OF TANK 60 INCIDENT THAT WERE SUBSEQUENTLY DEMOLISHED

EXISTING BUILDINGS THAT WERE PRESENT AT TIME OF TANK 60 INCIDENT

TANK NO. 60

NOTES:

1. GROUNDWATER AT TEMPORARY WELL POINT TWP-01 WAS NOT SAMPLED IN DURING THE 1993 INVESTIGATION.
2. ESL-8/ESL-W1 WAS AN SFI SHALLOW SOIL BORING AND TEMPORARY GROUNDWATER SAMPLING LOCATION.
3. ESL-1 THROUGH ESL-12 WERE INSTALLED DURING THE 1998 SFI. ESL-13 THROUGH ESL-20 WERE INSTALLED DURING THE 1999 SFI COMPLETION. ESL-21 THROUGH ESL-26 WERE INSTALLED DURING THE ESPA INVESTIGATION COMPLETION, DECEMBER 14, 2001.
4. LOCATION OF FORMER BUILDINGS AND PROPERTY DIVISIONS ARE BASED ON SANBORN FIRE INSURANCE MAPS AND AERIAL PHOTOGRAPHS PRIOR TO 1976.

60' 0 60'

Title:

SITE PLAN WITH SAMPLING LOCATIONS

BUFFALO TERMINAL, BUFFALO, NEW YORK

Prepared For:

EXXONMOBIL OIL CORPORATION

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: N.C.	Date: 12MAR02	FIGURE
Prepared by: R.K.	Scale: AS SHOWN	3
Project Mgr: N.C.	Office: NY	
File No: MC5218003	Project: 17252Y04	

APPENDIX A

Soil Boring Logs for Borings Completed on December 14, 2001

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

1377 Motor Parkway
Islandia, New York 11749
Telephone: 631-232-2600
Fax: 631-232-9898

SOIL BORING LOG

WELL NO. **ESL-21**	NORTHING	EASTING		
PROJECT NO./NAME **17252Y03 / ExxonMobil Buffalo Terminal**		LOCATION **625 Elk Street**		
APPROVED BY	LOGGED BY **M. Falzone**	**Buffalo, New York**		
DRILLING CONTRACTOR/DRILLER **ZEBRA /**		GEOGRAPHIC AREA **ESPA**		
DRILL BIT DIAMETER/TYPE **2-in. /**	BOREHOLE DIAMETER **3-inches**	DRILLING EQUIPMENT/METHOD **Hand Auger / Geoprobe**	SAMPLING METHOD **H. Auger/Macrocore**	START-FINISH DATE **12/14/01-12/14/01**
LAND SURFACE ELEVATION **(FT.)**	DEPTH TO WATER **(Feet BLS)**	BACKFILL		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		FILL- Brown fine to medium SAND, little Silt, Clay, Organic material; Moist		0.0	
		NOT LOGGED			
1					1
2					2
		FILL- Gray/brown medium to coarse SAND, little Silt, Clay and Brick, trace gray Ash; Moist		0.0	
3					3
					Bottom of boring at 3 ft bls
4					4

BORING/WELL 17252Y03.GPJ ROUX.GDT 1/17/02

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

1377 Motor Parkway
Islandia, New York 11749
Telephone: (631) 232-2600
Fax: (631) 232-9898

SOIL BORING LOG

WELL NO. **ESL-22**	NORTHING	EASTING		
PROJECT NO./NAME **17252Y03 / ExxonMobil Buffalo Terminal**		LOCATION **625 Elk Street**		
APPROVED BY	LOGGED BY **M. Falzone**	**Buffalo, New York**		
DRILLING CONTRACTOR/DRILLER **ZEBRA /**		GEOGRAPHIC AREA **ESPA**		
DRILL BIT DIAMETER/TYPE **2-in. /**	BOREHOLE DIAMETER **3-inches**	DRILLING EQUIPMENT/METHOD **Hand Auger / Geoprobe**	SAMPLING METHOD **H. Auger/Macrocore**	START-FINISH DATE **12/14/01-12/14/01**
LAND SURFACE ELEVATION **(FT.)**	DEPTH TO WATER **(Feet BLS)**	BACKFILL		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		FILL- Brown fine to medium SAND, little Silt, Organic material; Moist		0.0	
		NOT LOGGED			
1					1
2					2
		FILL- Yellow orange fine to medium SAND, trace Silt; Moist		0.0	
3					3
					Bottom of boring at 3 ft bls
4					4

BORING/WELL 17252Y03.GPJ ROUX.GDT 3/22/02

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

1377 Motor Parkway
Islandia, New York 11749
Telephone: (631) 232-2600
Fax: (631) 232-9898

SOIL BORING LOG

WELL NO. **ESL-23**	NORTHING	EASTING		
PROJECT NO./NAME **17252Y03 / ExxonMobil Buffalo Terminal**		LOCATION **625 Elk Street**		
APPROVED BY	LOGGED BY **M. Falzone**	**Buffalo, New York**		
DRILLING CONTRACTOR/DRILLER **ZEBRA /**		GEOGRAPHIC AREA **ESPA**		
DRILL BIT DIAMETER/TYPE **2-in. /**	BOREHOLE DIAMETER **3-inches**	DRILLING EQUIPMENT/METHOD **Hand Auger / Geoprobe**	SAMPLING METHOD **H. Auger/Macrocore**	START-FINISH DATE **12/14/01-12/14/01**
LAND SURFACE ELEVATION **(FT.)**	DEPTH TO WATER **(Feet BLS)**	BACKFILL		

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
0		FILL- Brown medium to coarse SAND, little Gravel, Ash, Organic material		0.0	
		NOT LOGGED			
1					1
2					2
		FILL- Gray/yellow orange SILT, some Clay; Moist		0.0	
3					3 Bottom of boring at 3 ft bls
4					4

BORING/WELL 17252Y03.GPJ ROUX.GDT 3/22/02

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

1377 Motor Parkway
Islandia, New York 11749
Telephone: (631) 232-2600
Fax: (631) 232-9898

SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
ESL-24				
PROJECT NO./NAME		LOCATION		
17252Y03 / ExxonMobil Buffalo Terminal		**625 Elk Street**		
APPROVED BY	LOGGED BY			
	M. Falzone	**Buffalo, New York**		
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ZEBRA /		**ESPA**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. /	**3-inches**	**Hand Auger / Geoprobe**	**H. Auger/Macrocore**	**12/14/01-12/14/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		FILL- Black/brown medium to coarse SAND, little Silt and Gravel, trace Brick and Organic matter		0.0	
		NOT LOGGED			
1					1
2					2
		FILL- Yellow orange fine to medium SAND, little Silt, trace Clay and fine to coarse Gravel; Moist		0.0	
3					3
					Bottom of boring at 3 ft bls
4					4

BORING/WELL 17252Y03.GPJ ROUX.GDT 3/22/02

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

1377 Motor Parkway
Islandia, New York 11749
Telephone: (631) 232-2600
Fax: (631) 232-9898

SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
ESL-25				
PROJECT NO./NAME		LOCATION		
17252Y03 / ExxonMobil Buffalo Terminal		**625 Elk Street**		
APPROVED BY	LOGGED BY	**Buffalo, New York**		
	M. Falzone			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ZEBRA /		**ESPA**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. /	**3-inches**	**Hand Auger / Geoprobe**	**H. Auger/Macrocore**	**12/14/01-12/14/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		FILL- Brown/black medium to coarse SAND, SILT and CLAY, trace Organic matter; Moist		0.0	Duplicate sample collected at 0-0.5 ft bls
		NOT LOGGED			
1					1
2					2
		FILL- Olive gray/yellow orange fine to medium SAND, little Silt and Clay; Moist		0.0	
3					3
					Bottom of boring at 3 ft bls
4					4

BORING/WELL 17252Y03.GPJ ROUX.GDT 3/22/02

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

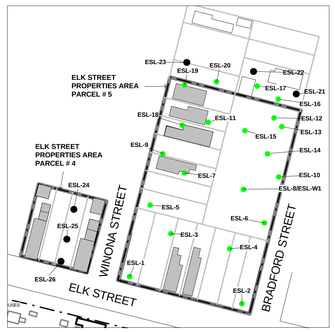
1377 Motor Parkway
Islandia, New York 11749
Telephone: (631) 232-2600
Fax: (631) 232-9898

SOIL BORING LOG

WELL NO.	NORTHING	EASTING		
ESL-26				
PROJECT NO./NAME		LOCATION		
17252Y03 / ExxonMobil Buffalo Terminal		**625 Elk Street**		
APPROVED BY	LOGGED BY	**Buffalo, New York**		
	M. Falzone			
DRILLING CONTRACTOR/DRILLER		GEOGRAPHIC AREA		
ZEBRA /		**ESPA**		
DRILL BIT DIAMETER/TYPE	BOREHOLE DIAMETER	DRILLING EQUIPMENT/METHOD	SAMPLING METHOD	START-FINISH DATE
2-in. /	**3-inches**	**Hand Auger / Geoprobe**	**H. Auger/Macrocore**	**12/14/01-12/14/01**
LAND SURFACE ELEVATION	DEPTH TO WATER	BACKFILL		
(FT.)	**(Feet BLS)**			

Depth, feet	Graphic Log	Visual Description	Blow Counts per 6"	PID Values (ppm)	REMARKS
		FILL- Brown medium to coarse SAND, some fine to coarse Gravel, little Silt; Moist		0.0	
		NOT LOGGED			
1					1
2					2
		FILL- Yellow orange fine to medium SAND, some Silt, little Clay, trace fine to coarse Gravel; Moist		0.0	
3					3
					Bottom of boring at 3 ft bls
4					4

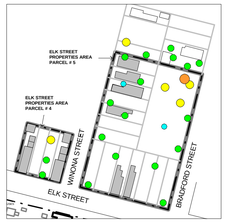
BORING/WELL 17252Y03.GPJ ROUX.GDT 3/22/02



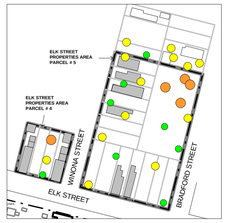
LOCATION MAP

SCALE: 1" = 100'

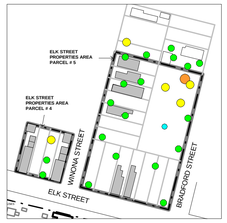
BENZO[A]ANTHRACENE



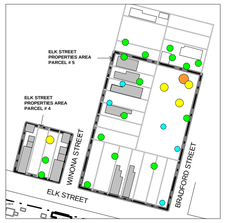
BENZO[A]PYRENE



BENZO[B]FLUORANTHENE



BENZO[K]FLUORANTHENE



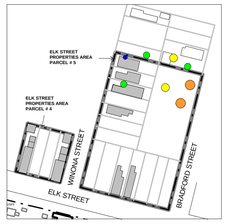
CHRYSENE

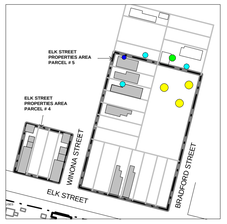
DIBENZO[A,H]ANTHRACENE

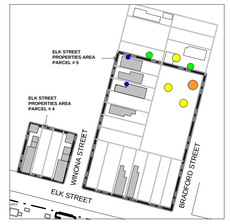
DEPTH INTERVAL

0 - 0.5 FT

SCALE: 1" = 150'



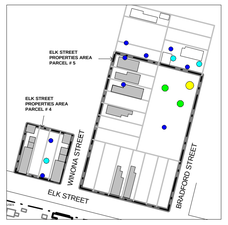


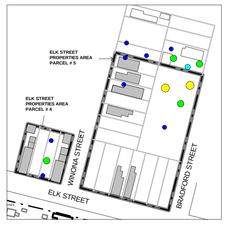


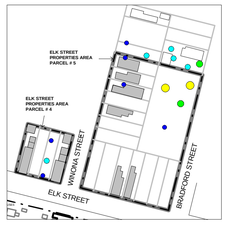
DEPTH INTERVAL

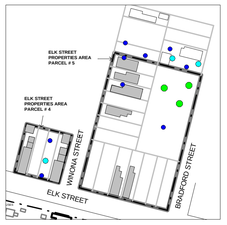
1 - 2 FT

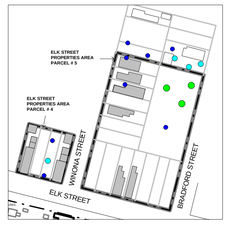
SCALE: 1" = 150'

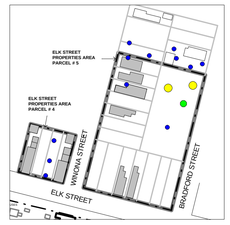












DEPTH INTERVAL

2 - 3 FT

SCALE: 1" = 150'

NOTE: DEPTH INTERVALS INDICATED CORRESPOND TO THE LABORATORY ANALYTICAL SAMPLE INTERVALS AND ARE RELATIVE TO THE BOTTOM OF ANY SURFACE MATERIAL ENCOUNTERED (ASPHALT, CONCRETE, VEGETATION, ETC.).

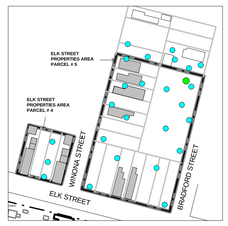
FLUOURANTHENE

INDENO[1,2,3-CD]PYRENE

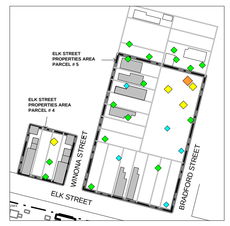
PHENANTHRENE

PYRENE

TOTAL SVOCS COMPARED TO NYSDEC RSCO



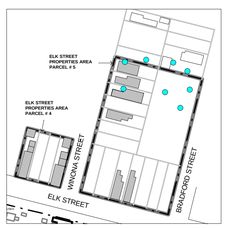
TOTAL SVOCS BY CONCENTRATION

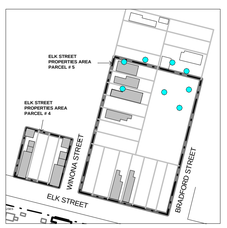


DEPTH INTERVAL

1 - 2 FT

SCALE: 1" = 150'





DEPTH INTERVAL

2 - 3 FT

SCALE: 1" = 150'

NOTES: DEPTH INTERVALS INDICATED CORRESPOND TO THE LABORATORY ANALYTICAL SAMPLE INTERVALS AND ARE RELATIVE TO THE BOTTOM OF ANY SURFACE MATERIAL ENCOUNTERED (ASPHALT, CONCRETE, VEGETATION, ETC.).

ESL-1 LOCATION AND DESIGANTION OF SFI/ SFI COMPLETION SOIL BORING

ESL-21 LOCATION AND DESIGANTION OF ESPA INVESTIGATION COMPLETION SOIL BORING

SFI SITE FACILITY INVESTIGATION

EXISTING BUILDINGS THAT WERE PRESENT AT TIME OF TANK 60 INCIDENT

BUILDINGS PRESENT AT TIME OF TANK 60 INCIDENT THAT WERE SUBSEQUENTLY DEMOLISHED

FORMER PROPERTY DIVISIONS

ESPA BOUNDARY

EXXONMOBIL PROPERTY LINE

	NYSDEC RSCO (ug/kg)
BENZO(A)ANTHRACENE	224
BENZO(A)PYRENE	61
BENZO(B)FLUORANTHENE	220
BENZO(K)FLUORANTHENE	220
CHRYSENE	400
DIBENZO(A,H)ANTHRACENE	14.3
INDENO(1,2,3-CD)PYRENE	3,200
FLUORANTHENE	50,000
PHENANTHRENE	50,000
PYRENE	50,000
TOTAL SVOCS	500,000

UG/KG - MICROGRAMS PER KILOGRAM

NOTE: (1) RESULTS FROM ESL-8/W-1 IN THE 8-10 FOOT DEPTH INTERVAL ARE SHOWN ON THE 2-3 FOOT DEPTH INTERVAL MAPS.

LEGEND FOR DISTRIBUTION OF SVOCS IN SHALLOW SOIL RELATIVE TO NYSDOH MEAN BACKGROUND LEVELS

- GREATER THAN OR EQUAL TO 1,000 TIMES NYSDEC RSCO
- 100 TO LESS THAN 1,000 TIMES NYSDEC RSCO
- 10 TO LESS THAN 100 TIMES NYSDEC RSCO
- 1 TO LESS THAN 10 TIMES NYSDEC RSCO
- LESS THAN NYSDEC RSCO
- NOT DETECTED

LEGEND FOR TOTAL SVOCS BY CONCENTRATION (IN UG/KG)

- GREATER OR EQUAL TO 5,000,000 UG/KG
- 500,000 TO LESS THAN 5,000,000 UG/KG
- 50,000 TO LESS THAN 500,000 UG/KG
- 5,000 TO LESS THAN 50,000 UG/KG
- LESS THAN 5,000 UG/KG
- NOT DETECTED

N

Title:

DISTRIBUTION OF SVOCS AND TOTAL SVOCS RELATIVE TO NYSDEC RSCOS AND DISTRIBUTION OF TOTAL SVOCS BY CONCENTRATION

Prepared For:

EXXONMOBIL OIL CORPORATION

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: NC	Date: 3/11/02	PLATE
Prepared by: NC	Scale: AS SHOWN	1
Project Mgr.: NC	Office: NY	
File No:MC5210001.WOR	Project: 17252Y04	

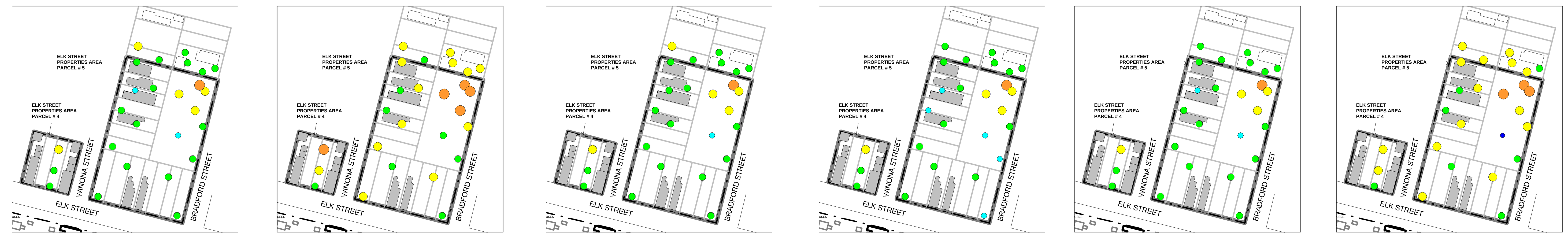
DISTRIBUTION RELATIVE TO NYSDEC RSCOS

DEPTH INTERVAL

0 - 0.5 FT

SCALE: 1" = 150'

BENZO[A]ANTHRACENE | BENZO[A]PYRENE | BENZO[B]FLUORANTHENE | BENZO[K]FLUORANTHENE | CHRYSENE | DIBENZO[A,H]ANTHRACENE



DISTRIBUTION RELATIVE TO NYSDOH BACKGROUND LEVELS FOR SHALLOW SOIL

DEPTH INTERVAL

0 - 0.5 FT

SCALE: 1" = 150'

NOTE: DEPTH INTERVALS INDICATED CORRESPOND TO THE LABORATORY ANALYTICAL SAMPLE INTERVALS AND ARE RELATIVE TO THE BOTTOM OF ANY SURFACE MATERIAL ENCOUNTERED (ASPHALT, CONCRETE, VEGETATION, ETC.).

DISTRIBUTION RELATIVE TO NYSDEC RSCOS

DEPTH INTERVAL

0 - 0.5 FT

SCALE: 1" = 150'

FLUOURANTHENE | INDENO[1,2,3-CD]PYRENE | PHENANTHRENE | PYRENE | TOTAL SVOCS

DISTRIBUTION RELATIVE TO NYSDOH BACKGROUND LEVELS FOR SHALLOW SOIL

DEPTH INTERVAL

0 - 0.5 FT

SCALE: 1" = 150'

NOTE: DEPTH INTERVALS INDICATED CORRESPOND TO THE LABORATORY ANALYTICAL SAMPLE INTERVALS AND ARE RELATIVE TO THE BOTTOM OF ANY SURFACE MATERIAL ENCOUNTERED (ASPHALT, CONCRETE, VEGETATION, ETC.).

LOCATION MAP

SCALE: 1" = 100'

- ESL-1 LOCATION AND DESIGANTION OF SFI/ SFI COMPLETION SOIL BORING
- ESL-21 LOCATION AND DESIGANTION OF ESPA INVESTIGATION COMPLETION SOIL BORING
- SFI SITE FACILITY INVESTIGATION
- EXISTING BUILDINGS THAT WERE PRESENT AT TIME OF TANK 60 INCIDENT
- BUILDINGS PRESENT AT TIME OF TANK 60 INCIDENT THAT WERE SUBSEQUENTLY DEMOLISHED
- FORMER PROPERTY DIVISIONS
- ESPA BOUNDARY
- EXXONMOBIL PROPERTY LINE

LEGEND FOR DISTRIBUTION OF SVOCS RELATIVE TO NYSDEC RSCOS OR NYSDOH BACKGROUND LEVELS FOR SHALLOW SOIL

- 100 TO LESS THAN 1,000 TIMES NYSDEC RSCO OR NYSDOH MEAN BACKGROUND LEVEL
- 10 TO LESS THAN 100 TIMES NYSDEC RSCO OR NYSDOH MEAN BACKGROUND LEVEL
- 1 TO LESS THAN 10 TIMES NYSDEC RSCO OR NYSDOH MEAN BACKGROUND LEVEL
- LESS THAN NYSDEC RSCO OR NYSDOH MEAN BACKGROUND LEVEL
- NOT DETECTED

	NYSDEC RSCO (ug/kg)	NYSDOH MEAN BACKGROUND LEVEL (ug/kg)
BENZO(A)ANTHRACENE	224	2,400
BENZO(A)PYRENE	61	2,300
BENZO(B)FLUORANTHENE	220	2,400
BENZO(K)FLUORANTHENE	220	2,300
CHRYSENE	400	2,900
DIBENZO(A,H)ANTHRACENE	14.3	270
INDENO[1,2,3-CD]PYRENE	3,200	1,900
FLUORANTHENE	50,000	5,000
PHENANTHRENE	50,000	3,000
PYRENE	50,000	4,500
TOTAL SVOCS	500,000	30,000

UG/KG - MICROGRAMS PER KILOGRAM

N

Title: **COMPARISON OF THE DISTRIBUTION OF INDIVIDUAL SVOCS AND TOTAL SVOCS IN SHALLOW SOIL RELATIVE TO NYSDEC RSCOS AND NYSDOH MEAN BACKGROUND LEVELS**

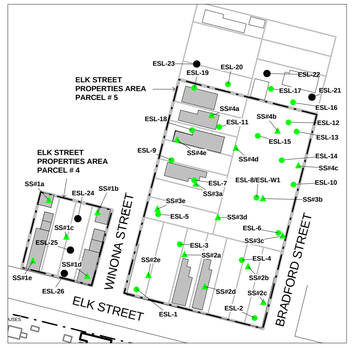
(0-0.5 FT DEPTH INTERVAL)

Prepared For: EXXONMOBIL OIL CORPORATION

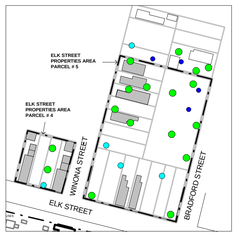
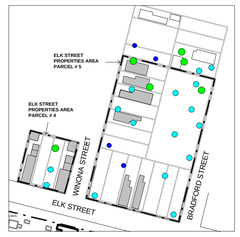
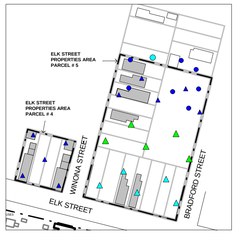
ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: NC	Date: 3/11/02	PLATE
Prepared by: NC	Scale: AS SHOWN	2
Project Mgr: NC	Office: NY	
File No:MC5218002.WOR	Project: 17252Y04	

LOCATION MAP



MAP SCALE: 1" = 100'

	CADMIUM	CHROMIUM	LEAD	MERCURY	NICKEL	SELENIUM	VANADIUM
DEPTH INTERVAL 0 - 0.5 FT scale: 1" = 150'							
DEPTH INTERVAL 1 - 2 FT scale: 1" = 150'							
DEPTH INTERVAL 2 - 3 FT scale: 1" = 150'							

NOTE: DEPTH INTERVALS INDICATED CORRESPOND TO THE LABORATORY ANALYTICAL SAMPLE INTERVALS AND ARE RELATIVE TO THE BOTTOM OF ANY SURFACE MATERIAL ENCOUNTERED (ASPHALT, CONCRETE, VEGETATION, ETC.).

- ESL-1 — LOCATION AND DESIGANTION OF SFI/ SFI COMPLETION SOIL BORING
- ESL-21 — LOCATION AND DESIGANTION OF ESPA INVESTIGATION COMPLETION SOIL BORING
- SS#1a — LOCATION AND DESIGNATION OF 1993 GTI COMPOSITE BORING, ONE SOIL SAMPLE WAS COMPOSITED FROM THE FIVE BORING LOCAITONS (A THROUGH F) (SEE FIGURE 3 FOR DESCRIPTION OF COMPOSITE SAMPLES)
- SFI — SITE FACILITY INVESTIGATION
- EXISTING BUILDINGS THAT WERE PRESENT AT TIME OF TANK 60 INCIDENT
- BUILDINGS PRESENT AT TIME OF TANK 60 INCIDENT THAT WERE SUBSEQUENTLY DEMOLISHED
- FORMER PROPERTY DIVISIONS
- ESPA BOUNDARY
- EXXONMOBIL PROPERTY LINE

	NYDEC RSCO (mg/kg)
CADMIUM	1
CHROMIUM	10
LEAD	500 (1)
MERCURY	0.1
NICKEL	13
SELENIUM	2
VANADIUM	150

mg/kg - MILLIGRAMS PER KILOGRAM

(1) RSCO FOR LEAD (500 MG/KG) IS BASED ON RANGE OF AVERAGE BACKGROUND LEVELS IN METROPOLITAN OR SUBURBAN AREAS OR NEAR HIGHWAYS OF 200-500 MG/KG. (SOURCE: NYSDEC TAGM 4046).

(2) COMPOSITE SAMPLES WERE ONLY COLLECTED IN THE 1-2 FT BLS INTERVAL AND WERE NOT ANALYZED FOR NICKEL AND VANADIUM.

(3) RESULTS FROM ESL-8/W-1 IN THE 8-10 FEET BLS INTERVAL ARE SHOWN ON THE 2-3 FEET BLS MAPS.

LEGEND FOR DISTRIBUTION OF METALS RELATIVE TO NYSDEC RSCOS

- 100 TO LESS THAN 1,000 TIMES NYSDEC RSCO (GRAB SAMPLE)
- 10 TO LESS THAN 100 TIMES NYSDEC RSCO (GRAB SAMPLE)
- 1 TO LESS THAN 10 TIMES NYSDEC RSCO (GRAB SAMPLE)
- LESS THAN NYSDEC RSCO (GRAB SAMPLE)
- NOT DETECTED (GRAB SAMPLE)
- 100 TO LESS THAN 1,000 TIMES NYSDEC RSCO (COMPOSITE SAMPLE)
- 10 TO LESS THAN 100 TIMES NYSDEC RSCO (COMPOSITE SAMPLE)
- 1 TO LESS THAN 10 TIMES NYSDEC RSCO (COMPOSITE SAMPLE)
- LESS THAN NYSDEC RSCO (COMPOSITE SAMPLE)
- NOT DETECTED (COMPOSITE SAMPLE)

N

Title:

DISTRIBUTION OF METALS RELATIVE TO NYSDEC RSCOS

Prepared For: EXXONMOBIL OIL CORPORATION

ROUX ASSOCIATES INC. Environmental Consulting & Management

Compiled by: NC	Date: 3/11/02	PLATE	
Prepared by: NC	Scale: AS SHOWN		3
Project Mgr: NC	Office: NY		
File No:MCS318003 WOR	Project: 17252V04		

LOCATION MAP

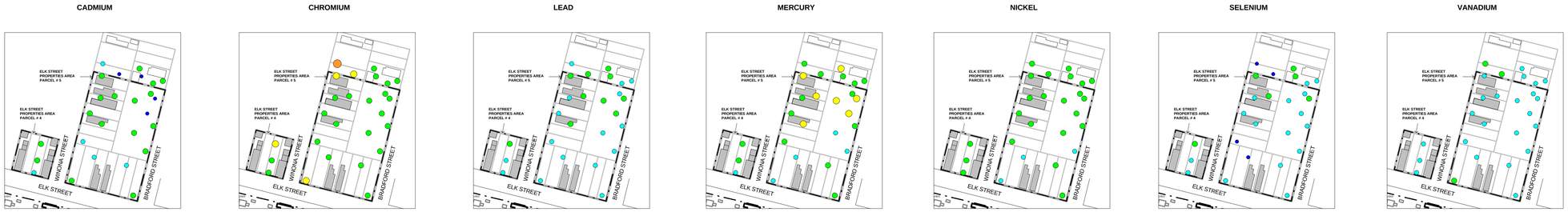
MAP SCALE: 1" = 100'

DISTRIBUTION RELATIVE TO NYSDEC RSCOS

DEPTH INTERVAL

0 - 0.5 FT

SCALE: 1" = 150'



DISTRIBUTION RELATIVE TO NYSDOH BACKGROUND LEVELS FOR SHALLOW SOIL

DEPTH INTERVAL

0 - 0.5 FT

SCALE: 1" = 150'

NOTE: DEPTH INTERVALS INDICATED CORRESPOND TO THE LABORATORY ANALYTICAL SAMPLE INTERVALS AND ARE RELATIVE TO THE BOTTOM OF ANY SURFACE MATERIAL ENCOUNTERED (ASPHALT, CONCRETE, VEGETATION, ETC.).

- ESL-1 — LOCATION AND DESIGANTION OF SFI/ SFI COMPLETION SOIL BORING
- ESL-21 — LOCATION AND DESIGANTION OF ESPA INVESTIGATION COMPLETION SOIL BORING
- SFI — SITE FACILITY INVESTIGATION
- EXISTING BUILDINGS THAT WERE PRESENT AT TIME OF TANK 60 INCIDENT THAT WERE SUBSEQUENTLY DEMOLISHED
- BUILDINGS PRESENT AT TIME OF TANK 60 INCIDENT THAT WERE SUBSEQUENTLY DEMOLISHED
- FORMER PROPERTY DIVISIONS
- ESPA BOUNDARY
- EXXONMOBIL PROPERTY LINE

LEGEND FOR DISTRIBUTION OF METALS RELATIVE TO NYSDEC RSCOS OR NYSDOH MEAN BACKGROUND LEVELS FOR SHALLOW SOIL

- 100 TO LESS THAN 1,000 TIMES NYSDEC RSCO OR NYSDOH MEAN BACKGROUND LEVEL
- 10 TO LESS THAN 100 TIMES NYSDEC RSCO OR NYSDOH MEAN BACKGROUND LEVEL
- 1 TO LESS THAN 10 TIMES NYSDEC RSCO OR NYSDOH MEAN BACKGROUND LEVEL
- LESS THAN NYSDEC RSCO OR NYSDOH MEAN BACKGROUND LEVEL
- NOT DETECTED

	NYSDEC RSCO (mg/kg)	NYSDOH MEAN BACKGROUND LEVEL (mg/kg)
CADMIUM	1	4
CHROMIUM	10	54
LEAD	500 (1)	728
MERCURY	0.1	0.4
NICKEL	13	37
SELENIUM	2	1.1
VANADIUM	150	37

mg/kg - MILLIGRAMS PER KILOGRAM

Notes: (1) RSCO for lead (500 mg/kg) is based on range of average background levels in metropolitan or suburban areas or near highways of 200-500 mg/kg (source: NYSDEC TAGM 4046).

N

Title: **COMPARISON OF THE DISTRIBUTION OF METALS IN SHALLOW SOIL RELATIVE TO NYSDEC RSCOS AND NYSDOH MEAN BACKGROUND LEVELS**

(0-0.5 FT DEPTH INTERVAL)

Prepared For: EXXONMOBIL OIL CORPORATION

ROUX ASSOCIATES, INC. Environmental Consulting & Management

Compiled by: NC	Date: 3/11/02	PLATE	4
Prepared by: NC	Scale: AS SHOWN		
Project Mgr: NC	Office: NY		
File No:MCS218003.WOR	Project: 17252Y04		