Documentation of Environmental Indicator Determination

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control

Facility Name: **Port Mobil Terminal**
Facility Address: **4101 Arthur Kill Road, Staten Island, NY 10309**
Facility EPA ID#: **NYD 000824516**

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EIs developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no unacceptable human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all contamination subject to RCRA corrective action at or from the identified facility [i.e., site-wide]).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objectives of the RCRA Corrective Action program the EIs are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, (GPRA). The "Current Human Exposures Under Control" EI is for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action programs overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determination status codes should remain in the RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Facility Information

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

__X__ If yes - check here and continue with #2 below.
____ If no - re-evaluate existing data, or
____ If data are not available skip to #6 and enter IN (more information needed) status code

Site Background

The Port Mobil Terminal ("the facility") is a petroleum bulk storage facility located on Staten Island in the city of New York. Attachment 1 illustrates the location of the site. The site encompasses approximately 200 acres, of which 120 acres are currently utilized for site operations. The facility is bounded to the north and west by the Arthur Kill, to the south by residential and industrial areas, and to the east by Clay Pit Pond State Park (A.T. Kearney, July 1993).

The facility began petroleum distribution operations in 1934. The facility currently stores and transfers gasoline (70%) and distillate fuels (30%) such as #6 fuel oil, #2 fuel oil, marine lube oils, and kerosene. Petroleum products are conveyed to and from the site via ships, barges, trucks and pipeline. The storage capacity at the site is 125 million gallons, with an annual throughput of approximately 1.4 billion gallons. Primary operations at the facility include above ground tank storage, storm water management and treatment, and material transfer activities (A.T. Kearney, July 1993; Fluor Daniel GTI, June 1998).

Groundwater at the facility generally occurs from 1 to 10 feet below ground surface (bgs) and flows west/northwest toward the Arthur Kill. The Final RCRA Facility Assessment (RFA) Report (A.T. Kearney, July 1993) determined that there are no known potable water wells on Staten Island. The nearest potable source is a surface water body located approximately ten miles northeast of the facility. Groundwater in the vicinity of the site reportedly has salinity levels above New York state drinking water standards, making human ingestion unlikely (Fluor Daniel GTI, April 1997).

Waters within the Arthur Kill have been designated SD class surface waters as defined in NYCRR, Title 6, Chapter X, Section 701.14. This designation refers to saline surface water conditions with a restricted use. Best usage of SD class surface waters is for fishing, and is suitable for fish survival. As subpart 701.14 states, "This classification may be given to those waters that, because of natural man-made conditions, cannot meet the requirements for primary and secondary contact recreation and fish propagation" (Fluor Daniel GTI, April 1997).

A total of 62 solid waste management units (SWMUs) and one area of concern (AOC) were identified and evaluated during the RFA. The 62 SWMUs include, among others, 2 surface impoundments, 41 dikes which surround the above ground storage tanks (ASTs) used for petroleum storage, 3 API separators, 3 waste storage ASTs, and 2 vacuum tanks. One of two surface impoundments was used for the management of wastewater containing benzene at concentrations that qualified the wastewater as a hazardous waste. The AOC was a former polychlorinated biphenyl (PCB) transformer site (A.T. Kearney, July 1993).

The facility submitted a RCRA Part B permit application for the surface impoundment on September 25, 1991. The facility ceased introducing hazardous waste into the surface impoundments in September 1993, thereby negating the need for a RCRA Part B operating permit. The two surface impoundments underwent partial closure in 2001 whereby all the waste and sediment was removed from the surface impoundments and the synthetic liner at the bottom of the surface impoundments was decontaminated (A.T. Kearney, July 1993; Woodward & Curran, March 2001).

Previous waste management practices at the facility included significant releases of petroleum-related contaminants to soil and groundwater at the site. For an estimated 60-year period, tank bottom water contaminated with petroleum products was routinely released from storage tanks directly onto the soil in the tank farm. Excavated contaminated soils have also been placed directly on the ground. Additional releases occurred through various spills and leaks (A.T. Kearney, July 1993).

On September 29, 1995, EPA issued a 3013 Order requiring the facility to investigate the entire site and determine the rate, extent, and concentration of contamination in soil and groundwater at the site. In response, the facility carried out an Interim Corrective Measures Investigation (ICMI) (Fluor Daniel GTI, April 1997) and a RCRA Facility Investigation (RFI) (Fluor Daniel GTI, July 1997).

For purposes of site investigation and remediation, the facility was divided into three areas: the Bulkhead Area, the Tank Farm Area, and the Surface Impoundment/North Beach Area, as shown in Attachment 2. Previous facility investigations and reports completed under the RCRA Corrective Action program and used in this evaluation are listed in the references section of this report.

On February 21, 2003, an explosion occurred at the facility. Most of the releases resulting from this explosion were either burned or contained by NYC Emergency Response Crews, and subsequently cleaned up by Mobil's personnel. However, the heat generated by the nearby fire destroyed aboveground components of the petroleum light non-aqueous phase liquid (LNAPL) recovery systems. System components were subsequently repaired or replaced and the ICM system was reactivated on April 15, 2003. In addition, soil and groundwater investigations and interim remedial actions are being conducted in other areas affected by the explosion such as the Ship Berth Areas No. 1A, and. 2, which will be completed by August 2003. Preliminary data shows no groundwater impacts as a result of the explosion, however, there is soil contamination in all above areas which have been fenced and restricted until removal is completed.

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be "**contaminated**"[1] above appropriately protective risk-based levels (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	**X**			Groundwater monitoring / BTEX (benzene, toluene, ethylbenzene, and xylenes), MTBE, PAHs, and lead
Air (indoors)[2]		**X**		Site-specific risk assessment results indicate that this pathway does not pose a significant risk (Fluor Daniel GTI, June 1998)
Surface Soil (e.g., <2 ft)	**X**			Sampling of impacted soils / BTEX, MTBE, PAHs, and heavy metals
Surface Water		**X**		Derived from groundwater sampling at perimeter wells / all COCs below EPA risk-based levels (National Ambient Water Quality Criteria)
Sediment		**X**		All sediments from Surface Impoundments were removed. Estimated sediment concentrations in tidal flats did not exceed NYS sediment quality criteria for constituents for which criteria were available (ExxonMobil, August 2000)
Subsurface Soil (e.g., >2 ft)	**X**			Sampling of impacted soils / BTEX, MTBE, PAHs, heavy metals, and LNAPL plumes
Air (Outdoor)		**X**		No significant impact expected from facility releases based upon site-specific risk assessment.

____ If no (for all media) - skip to #6, and enter YE, status code after providing or citing appropriate levels, and referencing sufficient supporting documentation demonstrating that these levels are not exceeded.

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

__X__ If yes (for any media) - continue after identifying key contaminants in each contaminated medium, citing appropriate levels (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

____ If unknown (for any media) - skip to #6 and enter IN status code.

Rationale and Reference(s).

Groundwater at the facility was thoroughly investigated during the Interim Corrective Measures Investigations (ICMI, Fluor Daniel GTI, April 1997) and RCRA Facility Investigation (RFI, Fluor Daniel GTI, July 1997). The RFI concluded that groundwater contamination at the facility primarily consisted of the following Contaminants of Concern (COCs): dissolved phase BTEX (benzene, toluene, ethylbenzene, and xylenes), polynuclear aromatic hydrocarbons (PAHs), and lead. Several COCs had concentrations above the New York State Ambient Groundwater Quality Standards, as shown in Table 1, attached. Table 1 shows Maximum concentrations detected in groundwater after Interim Corrective Measures (ICM) system started operations in 1997. Maximum detections of BTEX primarily occur in the Tank Farm Area, while maximum detections of MTBE, lead and most PAHs occur in the Bulkhead Area. Periodic groundwater monitoring for limited parameters has continued since these investigations, including an ongoing Monitored Natural Attenuation (MNA) program performed by Mobil on a voluntary basis and as part of its Corrective Measures Study (CMS) initiated in July 2000 (Woodward & Curran, April 2002) .

Soil sampling conducted during the ICMI (Fluor Daniel GTI, April 1997) and RFI (Fluor Daniel GTI, July 1997) revealed areas of significant surface and subsurface soil contamination. The primary COCs were BTEX, MTBE, PAHs, lead, mercury, and nickel. For the most part, the contamination was located in “hot spots”, as opposed to being widespread across the facility. A Risk Assessment (Fluor Daniel GTI, June 1998) was later conducted using data from the ICMI and RFI. The results of the Risk Assessment indicated unacceptable risk levels for some scenarios and receptors when the Reasonable Maximum Exposure scenario was used.

In response, the facility conducted targeted soil removals to reduce the maximum site concentrations of the contaminants that were primarily driving the risk. These contaminants (and their maximum detected concentrations) were benzene (170 mg/kg), benzo(a)pyrene (26 mg/kg), 1,1,1-trichloroethane (220 mg/kg), and trichloroethene (210 mg/kg). The removal actions, conducted in November 1998, December 1999, and March 2000, reduced the maximum detected concentrations of the aforementioned contaminants (IT Corporation, January 1999, February 2000, May 2000). 1,1,1-Trichloroethane and trichloroethene, which had been previously detected in only one soil boring in an area that was later excavated, were not present at detectable levels in the confirmatory samples. However, the soil concentrations of many contaminants in unexcavated areas, and in remaining soil in the excavated areas (as indicated by confirmatory sampling) still exceed their respective New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum (TAGM) 4046 recommended soil cleanup levels, as shown in Table 2. Further soil excavation activities are being considered in areas with residual soil contamination. All contaminated soil is located on-site.

Petroleum constituents in the form of light non-aqueous phase liquid (LNAPL) have been detected in subsurface soils and groundwater at the site. During the ICMI, a small area of LNAPL with a maximum thickness of 0.73 feet was characterized in the Bulkhead Area, adjacent to the bulkhead and the Arthur Kill. A recovery system was installed in that area in 1997 to remove LNAPL from the soil and groundwater. LNAPL was also detected during the RFI at monitoring well (MW) L-29 in the Tank Farm,

and during a soil removal near MW RFI-9 in the Bulkhead Area in November 1998. The LNAPL consists of 50 % slightly weathered gasoline and 50 % severely biodegraded distillate fuel oil (Fluor Daniel GTI, ICMI Report, 1997). According to the June 18, 1998 revision of the RFI Report, no measurable LNAPL now exists at MW L-29 since gauging has indicated that the well does not yield recoverable product (Fluor Daniel GTI, June 1998). After the soil excavation in the area of MW RFI-9, a recovery well (RW-4) and sump were installed to collect any remaining LNAPL (Fluor Daniel GTI, June 1998). In 2001, LNAPL was detected in the Tank Farm at wells I-6 (30 feet bgs) and RFI-7, and in the new Bulkhead Area well ICM-10 (Woodward & Curran, April 2002). Of these wells, only RFI-7 displayed a consistent, measurable recharge of LNAPL. In July 2002, the facility installed an LNAPL recovery well (RW-5) and trench system in the vicinity of RFI-7. In January 2003 two additional monitoring wells (MW-100 and MW-102) were installed downgradient of RFI-7 and RW-5 in the Tank Farm. LNAPL was detected in MW-100 following installation with a thickness up to 0.9 feet, and recovery activities at this were initiated in February 2003 (ExxonMobil, ICM Progress Report, May 13, 2003).

As of March 2003, a cumulative total of 112 gallons of LNAPL had been recovered through the facility's LNAPL recovery systems and wells (ExxonMobil, May 13 2003).

Sediment samples were collected on-site from the Lower and Upper Stormwater Surface Impoundments on September 15, 1999. Samples were analyzed for BTEX, MTBE, PAHs and total lead. Results of the analysis indicated elevated concentrations of benzene (8.9 mg/kg), benzo(a)anthracene (5.7 mg/kg), chrysene (22.4 mg/kg), benzo(b)fluoranthene (5.44 mg/kg), benzo(k)fluoranthene (2.61 mg/kg), benzo(a)pyrene (4.8 mg/kg), indeno(1,2,3-cd)pyrene (5.57 mg/kg) and total lead (404.0 mg/kg) in the Lower Stormwater Surface Impoundment. Similar results were provided for the Upper Stormwater Surface Impoundment. For both impoundments, the sediment was removed from the impoundments during the closure of these units in 2001, and the contaminated sediment was disposed off-site at a licensed disposal facility.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table
Potential Human Receptors (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespasser	Recreation	Food[3]
Groundwater	---	NO	---	YES	NO	--	---
~~Air (indoor)~~	---	---	---	---	---	---	---
Surface Soil (e.g. < 2	---	YES	---	YES	YES	---	---
~~Surface Water~~	---	---	--	--	---	---	---
Sediment	--	NO	--	NO	YES	---	---
Subsurface Soil (e.g.,	--	NO	--	YES	NO	--	---
~~Air (outdoors)~~	---	---	---	---	---	--	--

Instruction for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. Enter "yes" or "no" for potential "completeness" under each "Contaminated"Media - Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("--"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

___ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

X If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

Rationale and References:

Potentially complete human exposure pathways at the facility include exposure to contaminated surface soil (through dermal contact, incidental ingestion, and inhalation of volatiles and particulates) by trespassers, on-site workers, and construction/utility workers. Exposure to contaminants (including LNAPL) in subsurface soils (through dermal contact, incidental ingestion and inhalation of volatiles and particulates) is expected during construction and/or remediation activities only. Exposure to contaminants in sediments (through dermal contact, incidental ingestion and inhalation of volatiles) is not expected for on-site workers and construction workers at the site. Trespassers are assumed to come in contact with contaminated sediments off-site at the tidal flats.

Because the water table at the facility is generally less than 10 feet bgs, construction workers also have potential to be exposed to contaminated groundwater (through incidental ingestion, dermal contact and inhalation of volatiles) during excavation and remediation activities.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **significant**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks?

____ If no (exposures cannot be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

__X__ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code.

Rationale and References.

The site is 60% covered by impermeable materials such as pavement, clay liners, and other materials (Fluor Daniel GTI, June 1998). This characteristic, which describes the majority of the active portion of the facility, serves to reduce the potential for exposures to contaminated surface and subsurface soils. However, significant concentrations of highly toxic contaminants (most notably, benzo(a)pyrene and benzene) have been detected in the soil and sediments, which could lead to unacceptable risks.

Potentially unacceptable exposures may also occur during construction or remediation activities, when workers could be exposed to contaminated groundwater and LNAPL in subsurface soil.

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the "significant" **exposures** (identified in #4) be shown to be within acceptable limits?

__X__ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and reference:

As previously described, a site-specific Risk Assessment was performed in 1998 using data collected during the ICMI and RFI. The results of the Risk Assessment indicated unacceptable risk levels for some scenarios and receptors when the Reasonable Maximum Exposure (RME) scenario was used, that is the maximum contaminant concentrations were used for the risk assessment exposure. Specifically, risks which exceeded the acceptable range were identified for the following exposure pathways:

Inhalation of volatiles and particulates in soil for the on-site worker and construction worker, with the primary risk driver being benzene;
Dermal contact with soil for on-site workers and construction workers, with the primary risk driver being benzo(a)pyrene; and
Dermal contact with groundwater for construction workers, with the primary risk drivers being modeled leachate concentrations of 1,1,1-trichloroethane and trichloroethene.

However, there were no unacceptable risks to human health when average contaminant concentrations were used in the evaluation.

The total risk estimates under the REM scenario for a current on-site worker were a hazard index (HI) of 2.52 for non-carcinogenic hazards and a total cancer risk of 1.9×10^{-4}. The estimates for a future construction worker were an HI of 5.05 and a total cancer risk of 1.2×10^{-5}. The estimates for an on-site trespasser were an HI of 0.26 and a total cancer risk of 2.5×10^{-5}. The EPA's acceptable risk limit for cancer risks ranges between one in 1,000,000 (1x10 6) and one in 10,000 (1x10 4) for carcinogens, and a Hazard Index of 1.0 for non-cancer health effects. Therefore, there were no unacceptable risks to human health when average contaminant concentrations were used in the evaluation (Fluor Daniel GTI, June 1998).

After the Risk Assessment was conducted, the two primary hot spots where the maximum concentrations were detected were excavated, resulting in a reduction of the maximum detected concentrations of benzene and benzo(a)pyrene (as well as other constituents). No detectable concentrations of 1,1,1-trichloroethane and trichloroethene were found in soil at the site after the removal actions. Because the previously detected, higher concentrations of the contaminants resulted in only slightly elevated risks, these removal actions resulted in a reduction of risks to acceptable EPA levels as defined above. In addition, the RME scenario is highly conservative in that it uses maximum contaminant concentrations, while the use of average contaminant concentrations often provides a more realistic estimation of risk.

According to the facility, potential risks associated with direct contact with LNAPL, such as by construction workers, will be avoided by following appropriate OSHA safety requirements (e.g. personal protective equipment such as hard hat, glove and respirator, adequate training, and medical testings for COCs); and through a proposed deed restriction (Woodward & Curran, April 2002). These safeguards will also reduce the potential for significant exposure to contaminated groundwater.

Based upon a request from EPA, new calculations regarding the potential risks to human health in the areas of the on-site surface impoundments and the tidal flats were prepared. Risks were calculated for the teenage trespasser and the on-site worker. The estimate for the on-site worker were an HI of 0.028 and a total cancer risk of 4.0×10^{-8}. The estimates for the trespasser at the tidal flats were an HI of 0 and a total cancer risk of 3.0×10^{-11} (ExxonMobil, August 2000). All of these risk estimates are below EPA's acceptable levels.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

__X__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Port Mobil Facility, EPA ID No. NYD000824516, located at 4101 Arthur Kill Road, Staten Island, New York, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

___ NO - "Current Human Exposures" are NOT "Under Control."

___ IN - More information is needed to make a determination.

Completed by: Original signed by
_____ Date: _____
Wilfredo Palomino, EPA Project Manager

Reviewed by: Original signed by
_____ Date:_____
James Reidy, NY Section Chief
RCRA Programs Branch
EPA Region 2

Approved by: Original signed by
_____ Date:_____
Adolph Everett, Acting Chief
RCRA Programs Branch
EPA Region 2

Locations where references may be found:
References reviewed to prepare this EI determination are identified after each response. Reference materials are available at the USEPA Region 2, RCRA Records Center, located at 290 Broadway, 15th Floor, New York, New York.

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References Cited:

A. T. Kearney, July 16, 1993. Final RCRA Facility Assessment Report.

ExxonMobil Corporation (ExxonMobil). August 7, 2000. Mobil's Response to EPA's May 26, 2000 Comments on the Revised Risk Assessment Report.

ExxonMobil. November 12, 2002. Quarterly Progress Report, July -September 2002, Interim Corrective Measures.

Fluor Daniel GTI, Inc. (Fluor Daniel GTI) April 17, 1997. Interim Corrective Measures Investigation Report.

Fluor Daniel GTI. July 2, 1997 (revised June 18, 1998). RCRA Facility Investigation (RFI) Draft Report.

Fluor Daniel GTI. June 1998 (revised December 1998). Risk Assessment.

IT Corporation. January 21, 1999. Letter Report on Soil Excavation at Siphon Building.

IT Corporation. February 11, 2000. Port Mobil SV/RFI, October-December 1999 Progress Report.

IT Corporation. May 11, 2000. Port Mobil SV/RFI, January-March 2000 Progress Report.

Woodward & Curran, Inc. March 14, 2001 (revised September 18, 2002). Surface Impoundment Closure Report.

Woodward & Curran, Inc. April 26, 2002. Corrective Measures Study Report.

Tables and Attachments

The following tables and attachments have been provided to support this EI determination:

Table 1 – Maximum Concentrations Detected in Groundwater at Port Mobil Terminal
Table 2 – Maximum Concentrations Detected in Soil at Port Mobil Terminal
Attachment 1 – Site Location Map (From Woodward & Curran, Inc., 2002)
Attachment 2 – Site Map (From Woodward & Curran, Inc., 2002)

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

Table 1. Maximum Concentrations Detected in Groundwater at Port Mobil Terminal

Constituent[1]	Sample Identification of Maximum Detection	Maximum Concentration Detected (ug/l)		NY WQS[2] for Groundwater (ug/l)
		Jun 1998	Jan 2003	
Benzene	RFI-6	**8,800**	**1200**	1
Toluene	RFI-6	**19,000**	**310**	5
Ethylbenzene	I-6	**6,000**	**2900**	5
Xylenes	I-6	**30,000**	**1300**	5
MTBE	ICM-5	**1,900**	**NA**	50
Naphthalene	I-6	**1,200**	**550**	10
Acenaphthylene		271	1.4J	n/a
Acenaphthene	ICM-1	**36**	**6.1J**	20
Fluorene	ICM-1	24	1.7	50
Phenanthrene	ICM-8	30	NA	50
Anthracene	ICM-1	15	0.8	50
Fluoranthene	ICM-1	8	1.2	50
Pyrene	ICM-5	33	<0.2	50
Benzo(a)anthracene	L-29	**7.6**	**NA**	0.002
Chrysene	ICM-3	**10**	**2.5**	0.002
Benzo(b)fluoranthene	ICM-5	**0.69**	**<0.2**	0.002
Benzo(k)fluoranthene	ICM-1	**0.25**	**<0.04**	0.002
Benzo(a)pyrene	ICM-5	1.8	<0.02	n/a
Dibenzo(a,h)anthracene	ICM-5	0.77	<0.04	n/a
Benzo(g,h,i)perylene	ICM-9	0.21	0.029	n/a
Indeno(1,2,3-cd)pyrene	ICM-8	**0.28**	**NA**	0.002
1-Methylnaphthalene	I-6	450	150J	n/a
2-Methylnaphthalene	I-6	**810**	**3700**	50
Lead	L-29	**335**	**0.0082**	25

[1] Constituents in **bold** exceed their respective benchmark.
[2] WQS = Water Quality Standards from Table 1 in §703.5.
Data from Fluor Daniel GTI, June 1998 (Table 3-2); and Woodward & Curran, MNA 2003.

n/a - Not available

Table 2. Maximum Concentrations Detected in Soil at Port Mobil Terminal

Constituent[1]	Sample Identification of Maximum Detection	Area of Maximum Detection[2]	Maximum Concentration Detected (mg/kg)	NY TAGM[3] 4046 Soil Cleanup Objectives (mg/kg)
Benzene	RFI-8	NB	**23**	0.06
Toluene	GPTF-9	TF	**72**	1.5
Ethylbenzene	GPTF-13	TF	**130**	5.5
Xylenes	VT2A-EW-S*	BH	**490**	1.2
MTBE	RFI-8	NB	**22**	0.12
Acetone	GPAP-3	BH	**2.8**	0.2
Methylene chloride	GPAP-9	NB	0.02	0.1
Naphthalene	8*	TF	**170**	13
Acenaphthylene	8*	TF	21	41
Fluorene	8*	TF	**60**	50
Phenanthrene	2C*	TF	**138**	50
Anthracene	8*	TF	**199**	50
Fluoranthene	8*	TF	**65.9**	50
Pyrene	2C*	TF	**146**	50
Benzo(a)anthracene	8*	TF	**19.4**	0.224
Chrysene	8*	TF	**32.8**	0.4
Benzo(b)fluoranthene	2C*	TF	**15.1**	1.1
Benzo(k)fluoranthene	2C*	TF	**9.1**	1.1
Benzo(a)pyrene	2C*	TF	**24.3**	0.061
Dibenzo(a,h)anthracene	2C*	TF	**4.1**	0.014
Benzo(g,h,i)perylene	2C*	TF	22.1	50
Indeno(1,2,3-cd)pyrene	8*	TF	**13**	3.2

Table 2. Maximum Concentrations Detected in Soil at Port Mobil Terminal (Continued)

Constituent[1]	Sample Identification of Maximum Detection	Area of Maximum Detection[2]	Maximum Concentration Detected (mg/kg)	NY TAGM[3] 4046 Soil Cleanup Objectives (mg/kg)
1-Methylnaphthalene	2C*	TF	110	n/a
2-Methylnaphthalene	RFI-7	TF	**150**	36.4
Dimethylphthalate	GPAP-5	TF	0.23	2.0
Di-n-butylphthalate	GPAP-3	TF	0.083	8.1
bis(2-ethylhexyl)phthalate	GPAP-2	TF	1.3	50.0
Arsenic	GPAP-11	TF	**11.5**	7.5
Cadmium	GPAP-11	TF	**2.2**	1
Chromium	GPAP-1	BH	**55.8**	10
Copper	GPAP-1	BH	**167**	25
Lead	GPAP-1	BH	214	n/a
Mercury	GPAP-3	BH	**0.7**	0.1
Nickel	GPAP-11	TF	**478**	13
Zinc	GPAP-11	TF	**222**	20

[1] Constituents in **bold** exceeded their respective benchmark.
[2] BH = Bulkhead Area, NB = North Beach Area, TF = Tank Farm Area
[3] TAGM = Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels (NYSDEC, 1994).
* = Samples 8, 2C and VT2A-EW-2 were confirmatory samples collected after the removal actions.
n/a = no published soil cleanup objective criteria available.
Data from Fluor Daniel GTI, April 1997 and July 1997; and IT Corporation, January 1999, February 2000 and May 2000.