DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRAInfo code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: **Military Ocean Terminal**
Facility Address: **Bayonne, Hudson County, New Jersey**
Facility EPA ID#: **NJ0210022752**

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 "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "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 "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated groundwater and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

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

Facility Information

The Military Ocean Terminal, Bayonne (MOTBY), is located on a 679-acre man-made peninsula. It is located adjacent to (west of) the City of Bayonne in Hudson County, northeastern New Jersey. The peninsula is approximately 10,000 feet long and extends eastward into the Upper New York Bay. The site varies from approximately 3,000 feet wide at the west end to 1,400 feet wide at the east end. Dredged channels lie to the south (South Channel) and north (North Channel) of the peninsula. The Hudson River enters Upper New York Bay to the northeast of MOTBY, while Kill Van Kull enters

Upper New York Bay just south of MOTBY. Staten Island is immediately south of Kill Van Kull. The region surrounding MOTBY is extensively developed and mostly industrial (Ref. 1).
Site use as a port terminal extends back to 1939 when dredged fill material was first used to create the peninsula. In 1941, the U.S. Navy purchased the terminal and performed additional construction. The facility currently known as MOTBY was established in July 1965 as a tenant of the U.S. Naval Supply Center. While under Department of Navy control, the facility served as the primary East coast distribution point for ordnance and electronic materials and stored war reserve materials. It also served as a storage and issue point for petroleum products, supplied fresh provisions and bulk petroleum to ships, and served as a storage point for National Stockpile Material.

Title for this property was transferred to the U.S. Army in 1967. In 1995, MOTBY was designated for closure under the Base Realignment and Closure Act (BRAC) and in September 1999, MOTBY terminated all military operations. The installation is currently maintained by the City of Bayonne and houses office space in Building 82 for a portion of the city's police force, administrative staff, and maintenance staff. The City of Bayonne's fire department operates a fire station in Building 44B, and the U.S. Coast Guard (USCG) operates an active facility located at Areas 75 and 85.

Based on the 1997 Environmental Baseline Survey (EBS), areas of the base were assigned an Environmental Condition of Property (ECP) Category from 1 through 7, as defined by the Community Environmental Response Facilitation Act (CERFA) (Ref. 1). Areas identified as Categories 1 through 4 are considered clean and no further action is necessary. The EBS concluded that approximately 560 acres at the site require no further action (Ref. 1). Further investigations were conducted at the remaining areas to determine the environmental condition of the property, as discussed in the following assessment. The Draft Decision Document submitted in December 2001 (Ref. 3) presents remedial actions associated with groundwater at the site. NJDEP is currently reviewing the Draft Decision Document.

References:

1. Environmental Baseline Survey, Military Ocean Terminal Bayonne. Prepared by Ecology and Environment, Inc. Dated January 1997.
2. Remedial Investigation Report. Prepared by Ecology and Environment, Inc. Dated September 1998.
3. Draft Decision Document for Nine Areas of Concern/Operable Units at Military Ocean Terminal, Bayonne, New Jersey. Prepared by Ecology and Environment. Dated December 2001.

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

SUMMARY OF AREAS OF CONCERN

The initial Remedial Investigation (RI) (Ref. 1) divided MOTBY into 23 Operable Units (OU) to assess whether media had been adversely impacted due to site-related activities (Ref. 1). The Revised Phase I RI (Ref. 2), Phase II RI (Ref. 3), RI Report (RIR) (Ref. 6), Light Rail Parcel RI (Ref. 5), and Draft Supplemental RI (SRI) (Ref. 9), were performed to further identify and delineate contamination at 12 OUs where impacted media was identified during the initial RI, as well as to provide additional information to support Feasibility Studies (FS) (Ref. 12). An additional investigation, the Supplemental RI Wells at Lots 95 and 205 (Ref. 13), was performed in 2001 based on anecdotal information regarding waste/debris management in OU20. The following discussion provides a brief description of all 23 OU investigations, including the contaminants detected above relevant NJDEP standards, as discussed in the Draft SRIR (Ref. 9), the Light Rail Parcel RI (Ref. 5), and the Draft FS (Ref. 10)[1], and the FS (Ref. 12). A facility map showing each OU is presented in Figure 4-7 of the Final Environmental Impact Statement for BRAC 95 Disposal and Reuse of the MOTBY (Ref. 8).

OU1. Coast Guard: This OU includes the water tower and all facilities associated with the sewage treatment plant. In most of this area, there has been no storage, release, or disposal of hazardous waste or petroleum products. Based on the 1997 EBS, this area was listed as a CERFA Category 1 (Ref. 4), and thus requires no further action. However, the western portion of this area was given a CERFA Category 7, indicating that some areas are unevaluated or require additional investigation. This is due to unknown contamination in the western portion of this area, which was used as a former fire training area (Study Area [SA] 85), and where a kerosene spill occurred in 1989. The western portion also includes the former landing craft area and two USCG wells. This area has been evaluated as a separate investigation area apart from the Phase I RI to expedite transfer to the Coast Guard. The current status of this separate investigation was not found in the file materials.

OU2. Light Rail Parcel: This OU is located on the southwestern corner of the MOTBY facility. Potential contamination sources at this OU include three former underground storage tanks (USTs), possible discharges from a sanitary sewer, and possible spills from polychlorinated biphenyls (PCBs) transformers. Contaminants of concern in subsurface soil in this area include total recoverable petroleum hydrocarbons (TRPHs), PCBs, polynuclear aromatic hydrocarbons

[1] The Draft SRIR compared detected concentrations to the New Jersey Residential Direct Contact Soil Cleanup Criteria (NJ RDCSCC), while the Draft FS compared detected concentrations to the New Jersey Non-Residential Direct Contact Soil Cleanup Criteria (NJ NRDCSCC). Future intended use of the property is non-residential only.

(PAHs), volatile organic compounds (VOCs), and metals (arsenic, copper, lead, and zinc). This area was evaluated as a separate investigation area apart from the Phase I RI to expedite transfer. In the Light Rail Parcel RI Report (Ref. 5), the proposed action is to remove the contaminated soil for off-site disposal. Based on the 1997 EBS, this area was given a CERFA Category 6, indicating that storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but required response actions have not yet been implemented (Ref. 4). The FS addresses this area under the category of Miscellaneous Soils, Group 1, which refers to subsurface soils (> 2 feet below ground surface (bgs)). The proposed remedial action includes institutional (i.e., deed notice) and/or engineering controls (i.e., clean soil or asphalt cap).

OU3. Facility-Wide Mapping: This OU encompasses the entire site, considers all open areas. It is not defined by site use or potential contamination, and therefore requires no further investigation (Ref. 6).

OU4. Historic Fill Research: This OU encompasses historic fill investigations at the entire site. Based upon information provided in the 1998 RIR, historic fill was sufficiently delineated in a report entitled the Historic Fill Research Report, prepared by Ecology & Environment in 1997. The 1998 RI focused on identifying constituents contained within the fill material above the NJ RDCSCC. Based on analytical results, no further action was recommended at this OU as levels are below NJ RDCSCC (Ref. 6). NJDEP approved this determination as part of approval of the 1998 RIR (Ref. 7).

OU5. Hydrogeologic Characterization and Site-Wide Groundwater: This OU encompasses site-wide hydrogeologic characterization and groundwater investigations. Areas of specific attention include OU2, OU7, OU9, OU11, OU16, OU19, and OU20. Contaminants of concern include metals (arsenic, chloride, iron, manganese, sodium), VOCs, and one pesticide (4,4-p,p'-Dichlorodiphenyl dichloroethane (4,4-DDD)). In the FS (Ref. 12), the selected preferred remedial alternative for groundwater is natural attenuation of all dissolved contaminants detected above NJ GWQC and establishment of a monitoring program. In addition, an application for a Classification Exception Area (CEA) with the horizontal extent encompassing the entire peninsula was submitted to NJDEP in December 2000.

OU6. Sewer/Storm Drain System Survey: OU6 encompasses the site-wide sanitary sewer and storm drain systems. Investigations at this OU have been focused on SA 52 (around soil boring [SB] SB-06 through SB-09) which was identified as a potential x-ray film processing waste discharge point to the sanitary sewer at Building 52B. Subsurface soil sampling confirmed the presence of PAHs exceeding the NJ NRDCSCC. Because this OU encompasses several areas site-wide, it was not given an individual CERFA classification in the 1997 EBS. Contaminated soil above NJ NRDCSCC is primarily located at a depth of two feet bgs or greater (Group 1 Soil). A majority of the contaminated soil in this area is already covered by asphalt. The FS has proposed institutional actions (i.e., deed notice) and/or engineering controls (i.e., clean soil or asphalt cap) in SA 52.

OU7. Gas Station/Boiler Plant: This area is located near the northern bulkhead and includes a number of buildings and two heating oil pipelines, and consists of many sub-areas (SA 33, 44, 53, 55, and fuel oil USTs). Site uses in this OU have included storage, motor pool, maintenance shops, a locomotive/railroad maintenance shop, and a fire station. The heating oil pipelines were used to transfer oil directly from ships to the boiler plant USTs. These USTs were found to have leaked and were removed in 1998, though removal of the soils was not completed at that time. Contaminants of concern in surface soil include PAHs and one pesticide (aldrin) and in

subsurface soil includes PCB (Aroclor-1260) in excess of NJ NRDCSCC. Elevated concentrations of TPH were also detected. The 1997 EBS classified this area as CERFA Category 6, indicating areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but remedial actions have not yet been implemented (Ref. 4). The preferred remedial alternative for this OU is excavation and removal of petroleum-contaminated soils and institutional controls (i.e., deed notice to limit future use to nonresidential purposes) (Ref. 12).

OU8. Dry Dock: This area includes the dry dock, east berths, and hazardous waste disposal area 132-1. The dry dock was constructed by the Navy in 1943 and operated as a separate entity from the rest of the MOTBY facility. It has not been used since 1988. Suspected contaminant sources include paint, rust, anti-fouling agents, bilge water discharges, and other ship wastes, including sanitary wastes. Based on the results of the 1998 RI, no further action was recommended for the sludge storage area and the dry dock area, although removal and proper disposal of the sludge and harbor floor sediments prior to reuse were recommended (Ref. 6). The east berthing area (SA NY3) was assigned CERFA Category 7 due to the potential for residual contaminated sediment outside the caisson. The 1998 RIR recommended no further action for the off-shore sediments in this area because contaminant concentrations in sediments surrounding the MOTBY facility and throughout the harbor exceed several criteria. NJDEP approved this determination as part of approval of the 1998 RIR (Ref. 7).

OU9. Landfill/North Fill Area and Former Navy Drum Storage: The landfill is located at the western end of the MOTBY peninsula and encompasses approximately 26.3 acres. A variety of land uses, including drum storage, incinerator/burning platform (0.6 acres), and landfilling of wastes were performed at the site. In the early 1940s through 1960s, the landfill was used to dispose of wastes from the terminal. In 1969, the landfill was covered with sand and gravel, and since 1970 use has been limited primarily to construction debris disposal. The North Fill Area is approximately 32.6 acres of dredged fill material originally constructed as a barrier between the landfill and the ocean, with the landfill located to the south and the Defense Reutilization and Marketing Office (DRMO) storage area (OU11) to the east. For the most part, OU9 is currently wetland and portions are designated as wildlife and bird sanctuary. There is a spring located on the east side of the landfill. The spring discharges to a storm drain, which in turn empties into the North Channel. Groundwater samples collected during the SRI program indicated iron, manganese, and copper concentrations above NJ GWQC.

Primary contaminants of concern for surface soil are PAHs and for subsurface soil are PAHs and pesticides. Surface water samples were collected, and copper and lead were found to exceed Surface Water Quality Criteria (SWQC)[2]. Sediment samples also indicated metal concentrations above the NJ limits for sediments in fresh water conditions. The 1997 EBS classified the majority of this area as a CERFA Category 6, areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but remedial actions have not yet been implemented (Ref. 4). For the landfill area, the FS identified the preferred remedial alternatives as signing to control intrusive activities, placement of an earthen cover to eliminate potential exposures, and implementation of a deed notice to restrict future use of this OU to non-residential use. For the North Fill Area, the selected preferred

[2] Oberthaler, R., 1995. Water Quality Standards, Office of Environmental Planning, NJDEP, memorandum to distribution, re: Surface Water Quality Standards, Criteria Currently Applicable to New Jersey Surface Waters. As cited in SRIR, November 2000.

remedial alternative includes a deed notice and installation of a perimeter fence accompanied with sign postings to prevent exposure (Ref. 12).

OU10. Lot 101: The area consists of a variety of shops and administrative offices and includes PCB transformer storage as well as hazardous waste storage and handling. Arsenic and PCBs in surface soil and benzo(a)pyrene (B[a]P) and PCBs in subsurface soil were identified above NJ NRDCSCC. The 1997 EBS classified this area as CERFA Category 7, indicating areas that are unevaluated or require additional evaluation (Ref. 4). The extent of impacted soil was delineated during the SRI, and the FS recommended that a clean soil or asphalt cap be installed as an engineering control in the area and excavation and off-site disposal of PCB impacted soils at levels above 50 mg/kg (Ref. 12).

OU11. DRMO Storage Area: This area was used by the DRMO primarily for storage of materials, including excess equipment, scrap metal, and drums. The DRMO Storage Area was subdivided into three study areas including SA 203, SA 204, and SA 205. This area also includes a portion of the landfill, but landfill soil contamination identified within OU11 is being addressed under OU9. The contaminants of concern in surface soil include PAHs, PCBs, and metals (arsenic and copper) above NJ NRDCSCC, and in subsurface soil include PAHs and arsenic. The majority of this area was classified in the 1997 EBS as CERFA Category 5, indicating areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, and/or remedial actions are underway, but all required remedial actions have not yet been implemented (Ref. 4). The selected preferred remedial alternative in the FS is excavation of PCB hot spots, capping the affected soils with asphalt pavement, biannual review to certify conditions have not changed, and implementation of a deed notice limiting site use to non-residential use and restricting intrusive activities (Ref. 12).

OU12. Dry Dock Support Area: This OU was divided into three areas, including SA 103, SA 104, and SA 100P. Most of the facilities within this area were built by the U.S. Navy. Site uses included fire training, maintenance garages, a coal-fired heating plant, warehouses, administration buildings, an electrical substation, and hazardous waste and materials storage including pesticides, PCB oils, machine oils, and paint storage. The primary contaminants of concern in surface soil include PAHs, PCBs, pesticides and metals above NJ NRDCSCC and in subsurface soil include PAHs and TPH. Most of the area contamination occurs in surface soil, but some areas have contamination at depth. The 1997 EBS classified this area as CERFA Category 6, indicating areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but remedial actions have not yet been implemented (Ref. 4). Excavation prior to reuse was recommended in the Draft FS to eliminate potential discharge of contaminants to the harbor (Ref. 10). Contaminated soil above the NJ NRDCSCC in this area is located both at the surface (Group 2 soil) and at depths of two or more feet bgs (Group 1 soil). Institutional (i.e., deed notice) and/or engineering controls (i.e. soil or asphalt cap) controls have been proposed in the FS for this area.

OU13. Sewage Treatment Plant Area: A former warehouse within OU13 was the focus of investigation activities based on past storage and handling of pesticides and hazardous wastes. An above ground storage tank (AST) was also located within the area which contained an unnamed preservation compound. Several PAHs and arsenic were detected in subsurface soil at concentrations in excess of NJ NRDCSCC. The 1997 EBS classified this area as CERFA Category 6, indicating areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but remedial actions have not yet been

implemented (Ref. 4). The FS proposed implementation of institutional (i.e., deed notice) and/or engineering controls (i.e., soil cover or asphalt cap) for this area (Ref. 12).

OU14. Eastern Warehouse Area: This area encompasses a number of buildings that were used for storage of a variety of materials (e.g., paints, pesticides, hazardous materials, hazardous wastes, PCBs, and petroleum products). Of particular concern is an area between Buildings 12, 22 and 14, which was used as a hazardous materials and waste storage facility during the 1980s (Ref. 10). Several PAHs were detected in excess of the NJ NRDCSCC. The 1997 EBS classified this area as CERFA Category 6, indicating areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but remedial actions have not yet been implemented (Ref. 4). Contaminated soil above the NJ NRDCSCC is primarily located at depths of two feet bgs or greater (Group 1 soil). A majority of the contaminated soil in this area is already covered by asphalt. Institutional (i.e., deed notice) and/or engineering controls (i.e., soil or asphalt cap) controls have been proposed for the uncovered areas at this OU in the FS.

OU15. Command Center: This area includes a number of buildings in the south central portion of the peninsula and included film processing laboratories. Hazardous materials stored in this area include acids, solvents, and pesticides. Due to the history of uncontrolled drum storage at the terminal, possible petroleum storage and releases, and the presence of a rust removal/preservation room, the 1997 EBS classified this area as CERFA Category 6, indicating areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but remedial actions have not yet been implemented (Ref. 4). However, portions of this area were also classified as CERFA Category 7, because of the concerns raised about the possible sanitary discharges from film processing laboratories and residual concerns about hazardous materials and waste handling at the former printing plant and solvent room. PAHs were detected in soil in concentrations exceeding NJ RDCSCC during the 1998 RIR. Impacted soils in this area are located at depths of two feet bgs or greater (Group 1 soil) and are currently covered by asphalt. Based on analytical results, and the current and future planned use of this property, no further action was recommended for this OU (Ref. 6). NJDEP approved this determination as part of approval of the 1998 RIR (Ref. 7).

OU16. MTMC Command Center: This area includes a number of buildings that were formerly used for a variety of purposes, including a warehouse, administration building, post diner, library, recreation center, swimming pool, temporary barracks, post exchange/gas station, dry cleaning transfer point, abandoned sewage lift station, indoor firing range, and a privately operated vehicle processing station. Soil samples obtained in the former UST area detected concentrations of PAHs and total PCBs in excess of NJ NRDCSCC. The 1997 EBS classified this area as CERFA Category 6, indicating areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred, but remedial actions have not yet been implemented (Ref. 4). Impacted soil in this area is primarily at the surface with little or no coverage. Institutional (i.e., deed notice) and/or engineering controls (i.e., soil or asphalt cap) controls have been proposed in the FS for this area.

OU17. Railroad Classification Yard: The Railroad Classification Yard (RCY) is located south of the landfill and along the southern portion of the peninsula. The yard was designed and utilized for facilitation of railroad operations. Sample results indicated that several PAHs, metals, and one pesticide (dieldrin), were present in surface soils at concentrations in excess of NJ NRDCSCC. The 1997 EBS classified this area as CERFA Category 6, indicating areas where storage, release, disposal, and/or migration of hazardous substances or petroleum products has occurred,

but remedial actions have not yet been implemented (Ref. 4). The FS proposed placement of a 12-inch thick layer of clean soil to cap this OU and a deed notice to limit future use to nonresidential (Ref. 12).

OU18. Lots Adjacent Right-of-Way: This area includes SA 230, SA 234, and SA 235, which includes the Sentry Station. The 1997 EBS classified this area as CERFA Category 7 because of a report of contaminated backfill used in the vicinity of the 40th Street gate and the potential for migration of contamination from Highway 169 (Ref. 4). However, according to the Final Impact Statement for BRAC 95 Disposal and Reuse of MOTBY in December 1999, this OU does not currently require additional investigation (Ref. 8). Thus, no further action is required for this OU.

OU19. Civilian Use Areas: This area encompasses the Goldsboro Village (GBV) housing area, and SA 221 and 232, which include the recreational area, tennis courts, and picnic shelter. This area was designated as a civilian use area. Investigations in this area were based upon the potential migration and aerial fallout from former burning activities at Lot 222, as well as release of heating oil from a former UST in the GBV area (Ref. 4). Based on results provided in the 1998 RI, no further action was recommended in SA 221. In SA 222, total organic carbon (TOC) concentrations were above 10,000 mg/kg in 11 subsurface soil samples, but no individual compound was detected at a level above regulatory criteria. Thus, no further action was recommended in the 1998 RI (Ref. 6). NJDEP approved this determination as part of approval of the 1998 RIR (Ref. 7).

OU20. Potential Migration: This area includes SA 92 through SA 95, and SA 202. The majority of this area was classified in the 1997 EBS as CERFA Category 7 because of the possibility of historic use by the DRMO and the potential for migration from the former DRMO yard (Ref. 4). Sample results indicated that several PAHs and metals were present in surface and subsurface soils at concentrations in excess of NJ NRDCSCC (Ref. 12). Following the receipt of anecdotal evidence supplied by the City of Bayonne that waste/debris might be present, an additional groundwater investigation was performed in 2001 (Ref. 13). The FS proposed placement of a soil cover, repair of the existing asphalt cover, and a deed notice to limit future use to nonresidential purposes.

OU21. CERFA Reconsideration: This area includes SA 65, which is an open lot, toilet, and transformer distribution center. This area was classified in the 1997 EBS as CERFA Category 4, indicating areas where release, storage, disposal, and/or migration of hazardous substances or petroleum products has occurred and all remedial actions necessary to protect human health and the environment have been taken (Ref. 4). Thus, this area requires no further action.

OU22. CERFA Categories 1, 2, 3, and 4: This OU includes areas around the site that have been classified in the 1997 EBS as CERFA Categories 1 through 4, are considered clean and therefore, no further action is necessary (Ref. 4). According to the Final Impact Statement for BRAC 95 Disposal and Reuse of MOTBY in December 1999, this OU does not currently require investigation (Ref. 8).

OU23. Former PCB Transformer Investigation: This area includes all areas that utilized former PCB transformers. Based on the February 2001 Clean Parcels Decision Document, there are several PCB transformer locations requiring remediation or decontamination. PCB transformers were situated throughout the site in the following areas: OU2, OU7, OU10, OU12, OU14, OU15, and OU16. PCB contamination in surface and subsurface soils is being addressed with activities and investigations at each OU where PCB containing transformers were located.

The FS proposes excavation and off-site disposal of soil with PCB levels above 50 mg/kg (consistent with the Toxic Substances and Control Act [TSCA] PCB cleanup requirement), along with the implementation of engineering (asphalt paving cap) and institutional controls (deed notice to restrict future use to nonresidential) (Ref. 12).

In summary, a total of 23 OUs were investigated during the initial RI, and 11 of these OUs (OU5, OU6, OU7, OU9, OU10, OU11, OU12, OU13, OU14, OU16, and OU17) were identified as requiring additional investigations in the SRIR. In the FS, seven OUs (including OU5, OU7, OU9, OU11, OU17, OU20, and OU23) and miscellaneous soils (OU2, OU7, OU10, OU12, OU13, OU14, OU15, and OU16) were evaluated for remedial actions. OU1 and OU2 were evaluated under separate studies in order to expedite characterization. OU3, OU4, OU8, OU18, OU19, OU21 and OU22 are documented as requiring no further action.

References:

1. Remedial Investigation Report. Prepared by Dames & Moore. Dated September 1989.
2. Revised Phase I Remedial Investigation Report. Prepared by Dames & Moore. Dated September 1994.
3. Phase II Remedial Investigation Report. Prepared by Dames & Moore. Dated October 1994.
4. Environmental Baseline Survey, Military Ocean Terminal Bayonne. Prepared by Ecology and Environment, Inc. Dated January 1997.
5. Light Rail Parcel Remedial Investigation. Prepared by Ecology and Environment, Inc. Dated December 1997.
6. Remedial Investigation Report. Prepared by Ecology and Environment, Inc. Dated September 1998.
7. Letter from NJDEP to MOTBY, re: Remedial Investigation Report, September 1998. Dated December 4, 1998.
8. Final Environmental Impact Statement for BRAC 95 Disposal and Reuse of the MOTBY. Prepared by Tetra Tech, Inc. December 1999.
9. Draft Supplemental Remedial Investigation Report. Prepared by Ecology and Environment, Inc. Dated November 2000.
10. Draft Feasibility Study. Prepared by Ecology and Environment, Inc. Dated January 2001.
11. Letter from NJDEP to MOTBY, re: Draft Supplemental RIR, November 2000, et. al. Dated March 16, 2001.
12. Feasibility Study, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated October 2001.
13. Draft Supplemental Remedial Investigation Wells at Lots 95 and 205, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated December 2001.

2. Is **groundwater** known or reasonably suspected to be "**contaminated**"[3] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

_X_ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

____ If unknown - skip to #8 and enter "IN" status code.

Rationale:

Groundwater Conditions

The MOTBY site is underlain by four hydrogeological units: fill, harbor sediment, glacial sediment, and bedrock. The fill unit is comprised of sediment that was dredged from the floor of the New York Harbor for peninsula construction. It consists of sand and silt, with some clay, seashells and anthropogenic materials. Unit thickness varies from 12 feet at the western site boundary to 23 feet at the eastern boundary. The surface elevation of the fill is generally between eight and 10 feet above mean sea level (msl) (Ref. 5). The bottom elevation of the fill is below msl and below the low and high tide levels. Groundwater within the fill occurs under unconfined conditions. Average hydraulic conductivity, as determined from slug tests, is 3.6×10^{-3} cm/s. Groundwater recharge to the fill unit occurs via infiltration of precipitation and, to a much lesser extent, via groundwater inflow from the western site boundary where the peninsula joins the original land surface. The recharge creates a groundwater high at the western boundary that extends along the length of the peninsula, as can be seen from the water level contour map presented in Figure 4-1 of the RIR (Ref. 1). Groundwater flow is generally from the northwest towards the northeast and southeast, where discharge occurs along the peninsula perimeter into New York Harbor. The fill unit contains an upper fresh water layer and a lower saline water layer, separated by a zone of diluted brackish water which fluctuates in thickness depending on tide and precipitation events. The fresh water lense is thicker in the center of the peninsula, probably extending to the bottom of the fill, and thins to less than two feet above msl on the eastern side of the peninsula (Ref. 1). Fresh water within the fill is not used for potable water supply and no potable wells are permitted to be installed (per City of Bayonne regulations) (Ref. 5). The site is serviced by a public water supply.

The underlying unit is represented by the original harbor sediment, which consists of silt and clay, with varying amounts of sand and gravel. Due to construction activities the unit is not continuous across the site, particularly along the northwestern edge. In other areas, unit thickness is approximately four feet at the old shoreline to 25 feet at the eastern tip of the peninsula. The unit acts as an aquitard that, despite a slight downward gradient between the aquitard and the underlying glacial unit, has prevented contamination in the fill from migrating downward to the underlying glacial unit (Ref. 1).

[3] "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 appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

The underlying glacial unit consists of approximately 40 feet of clay, silt, sand, gravel and boulders. Because the overlying harbor sediment unit was cut by the dredged channels to the north (North Channel) and south (South Channel) of the peninsula, the glacial unit is in direct contact with the saline water in New York Harbor. The glacial unit is underlain by bedrock comprised of Manhattan Schist and arkosic sandstones of the Stockton Formation (Ref. 1).

Groundwater Quality

Following the recommendation to close the MOTBY facility, the U.S. Army conducted various environmental investigations. As part of the investigations, 65 monitoring wells were installed (Ref. 5). Four of these wells were installed in the glacial unit (MW10-DM02D, MW09-DM04CD, MW09-DM11D, MW09-07D) and one well was installed in the bedrock (MW09-DM03). The remaining wells were installed in the fill unit. Refer to Figure 3-1 of the CEA for a map of monitoring well locations (Ref. 5). In 2001, three additional monitoring wells (MW20-01, MW20-02, MW20-03) were installed within the OU20 area (Ref. 7). Locations for these wells are presented in Figure 2-1 of the Draft Supplemental Remedial Investigation Wells at Lots 95 and 205 (Ref. 7).

Contaminant concentrations in excess of the NJ GWQC for Class-IIA potable groundwater have been reported in the fill unit. Table 1 presents the maximum concentrations of these constituents reported during the latest sampling events (2000 and 2001). The maximum concentrations are reported in OUs 2, 7, 9, 11, 16, 19 and 20. During the initial RI in 1997, analytical results from 13 on-site wells indicated inorganic, VOC, and pesticide concentrations above the NJ GWQC (Ref. 1). Additionally, free product was detected floating in one well at OU7 (MW07-04), but was not detected in wells located within 200 feet downgradient. Additional groundwater sampling was conducted in March 2000 as part of the SRI (Ref. 3) and as part of a subsequent investigation preformed at OU20 (Ref. 7). Similar groundwater contamination at reduced concentrations was observed and consisted of inorganics (arsenic, chloride, iron, manganese, sodium), VOCs (including benzene, chlorobenzene, chloroform, 1,2-dichloropropane, ethylbenzene, 4-methyl-2-pentanone, methylene chloride, total xylene, tetrachloroethene (PCE), trichloroethene (TCE), vinyl chloride), and a pesticide (4,4-DDD) above NJ GWQC. According to the FS (Ref. 6), the inorganic constituents that exceed the NJ GWQC have been attributed to seawater (chloride and sodium) and fill composition (arsenic, iron, manganese, and sodium), a position that was accepted by NJDEP in a May 23, 2000 letter (Ref. 2). In addition, benzene concentrations above NJ GWQC in OU2 (well MW02-28) have been attributed to off-site, upgradient sources (Ref. 1). Groundwater contamination in these OUs will be discussed in more detail in the responses to the remaining questions (Questions 3, 4, 5, and 7).

Most of the exceedances occur in a single well; no site-wide pattern of groundwater contamination has been identified. MOTBY requested a reclassification of groundwater to Class III-B. The petition was declined December 2000 because MOTBY was unable to meet key conditions for a Class III-B designation (Ref. 4).

Table 1 - Groundwater Contaminants that Exceed Relevant NJ Standards at MOTBY (µg/L)

Operable Unit	Groundwater [1]		NJ GWQC
	Contaminant[2]	Concentration	
OU2 Light Rail Parcel	Benzene 4-Methyl-2-pentanone[3]	2.76 J 10,500	1 400
OU7 Gas Station/Boiler Plant	Chlorobenzene PCE TCE	10.8 5.83 2.92 J	4 1 1
OU9 Landfill and North Fill Area	1,2-Dichloropropane	4.88 J	1
OU11 DRMO Storage Area	Vinyl chloride	7.93 J	5
OU16. MTMC Command Center	Benzene Ethylbenzene m,p-Xylene MTBE	1,110 823 212 103	1 700 40 70
OU19 Civil Use Areas	4,4-DDD	0.492	0.1
OU20 Potential Migration	cis-1,2-Dichloroethene (DCE) Vinyl Chloride	118 60	10 5

[1] Concentration represents the maximum detected value for each contaminant by area. Samples collected in March 2000 and results presented in Table 5-2 of the SRIR (Ref. 3), except for OU20 which were collected in November 2001 and presented in Table 3-1 of the Supplemental Remedial Investigation Wells at Lots 95 and 205 (Ref. 7). Groundwater concentrations are screened against the NJ GWQC or the Practical Quantitation Levels (PQL), whichever is higher. Concentrations denoted with a "J" indicates an estimated value.

[2] Inorganic constituents that exceeded NJ GWQC have been attributed to saltwater and fill composition and therefore are excluded from the table.

[3] The source of 4-methyl-2-pentanone is unknown, but is possibly linked to methanol that was not successfully rinsed from the sample bailer during the field decontamination procedure (Ref. 3).

References:

1. Remedial Investigation Report, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated September 1998.
2. Letter from Robert Hayton, NJDEP, to Mirza Baig, HQMTMC FOA Bayonne, re: Historic Fill, Military Ocean Terminal, Bayonne, Hudson County, New Jersey. Dated May 23, 2000.
3. Draft Supplemental Remedial Investigation Report. Prepared by Ecology and Environment, Inc. Dated November 2000.
4. Letter from NJDEP to MOTBY, re: Petition to Reclassify Waters at MOTBY, September 2000, et.al. Dated December 13, 2000.
5. Application for Designation of a Classification Exception Area. Prepared by Ecology and Environment, Inc. Dated May 2001.
6. Feasibility Study, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated October 2001.
7. Draft Supplemental Remedial Investigation Wells at Lots 95 and 205, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated December 2001.

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[4] as defined by the monitoring locations designated at the time of this determination)?

X	If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2].
____	If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.
____	If unknown - skip to #8 and enter "IN" status code.

Rationale:

Contaminant Migration

The migration of contaminated groundwater appears to be stabilized at the MOTBY facility as evidenced by the following conditions:

- The vertical extent of contamination is limited to the base of the historic fill. Vertical downward migration is inhibited by the harbor sediment unit. The clay-silt unit is continuous across the site and has a low hydraulic conductivity (Ref. 1).

- Contaminant concentrations within the fill unit in the majority of wells appear to be decreasing due to natural attenuation. Table 2 compares VOC and pesticide analytical data obtained in 1997 (Ref. 1) and 2000 (Ref. 2). These data, which are arranged by OU, provide an indication of the magnitude of concentration declines. Because only two sets of data are available, it is impossible to establish, with any confidence, that a declining trend exists. However, the magnitude of the declines from 1997 to 2000 (e.g. benzene decline from 3100 µg/L to 1110 µg/L in MW16-02) provide some confidence that the declines are real and not due to data variability.

  Although contaminant concentrations appear to be declining, it is estimated that there will be some migration before concentrations decline to the NJ GWQC (Ref. 4). For example, it was estimated that 1,2-dichloropropane in MW09-DM05 will migrate from 13 feet to 100 feet before decreasing to the NJ GWQC (MW09-DM05 is not included in Table 2 because 1,2-dichloropropane was not included in the 1997 RIR sampling program). Other contaminants are estimated to migrate shorter distances: PCE (5 feet) and TCE (14 feet) at MW07-09, 4,4-DDD (0.6 feet) at MW19-DM01, benzene (12 feet) and MTBE (4 feet) at MW16-02. These calculations were made by calculating

[4] "Existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

pollutant transport rate (average groundwater velocity divided by the retardation factor), and an estimate of constituent half-life obtained from literature. In the case of TCE for MW07-09, for example, an average groundwater velocity of 25.1 feet/year was calculated using an average hydraulic conductivity obtained from slug tests, hydraulic gradient from nearby water level data, and assuming an effective porosity of 25 %. A retardation factor of 32 was obtained by using the fraction of organic carbon of the fill obtained from the RI (Ref. 1) and assuming an organic carbon partition coefficient and a bulk dry density from the literature. Thus, the resultant pollutant transport rate of 0.8 feet/year was calculated as the average groundwater velocity divided by the retardation factor. Starting at a TCE concentration of 2.96 µg/L, it would take less than two half-lives to decrease to the TCE criteria of 1 µg/L. Assuming a half-life from the literature of 4.5 to 8.9 years and a transport rate of 0.8 feet/year, it was estimated that the TCE would migrate seven to 14 feet before reaching the NJ GWQC criteria for TCE.

- Concentrations in downgradient wells are generally decreasing or remaining stable, which supports the conclusion that only minimal migration is occurring (Ref. 6).

- Contaminated groundwater in the area of OU20 is discharging to the North Channel, thus limiting the lateral extent of VOC migration in this area (Ref. 8). More information on this discharge is provided in the response for Questions # 4 and # 5.

- Remaining source material will be removed as part of the proposed remedial action. According to the FS, which is currently under NJDEP review, no known source material exists in the unsaturated zones in areas where groundwater contamination exists (Ref. 6). However, there is residual product at OU7 associated with the former boiler plant, which is proposed to be excavated.

Table 2 - Comparison of Contaminant Concentrations Over Time in MOTBY Wells that Exceeded NJ GWQC (µg/L)

Operable Unit	Well I.D.	Contaminant[1]	NJ GWQC	RIR Data October 1997[2]	SRIR Data March 2000[3]
2	MW02-28	Benzene	1	11	2.76 J
7	MW07-08	Chloroform	6	8	ND
	MW07-09	Chlorobenzene	4	21	10.8
		PCE	1	1.2 J	5.83
		Vinyl Chloride	5	8.2 J	ND
	MW07-13	Benzene	1	390	ND
11	MW11-DM16	Vinyl Chloride	5	10	7.93 J
16	MW16-02	Benzene	1	3,100	1,110
		Ethylbenzene	700	2000 J	823
		Methyl Tertiary Butyl Ether	70	100 J	103
19	MW19-DM01	4,4-DDD	0.1	0.06	0.492

[1] Only those constituents that were analyzed in both the RI and SRI programs are included.
[2] Ref. 1
[3] Ref. 2
ND not detected at the quantitation limit. Concentrations denoted with a "J" indicates an estimated value.

Proposed Remedial Action and Monitoring

The facility proposes to remediate groundwater contamination through natural attenuation (Refs. 6, 7, 8). The proposal, as presented in the Draft FS (Ref. 3), was accepted by NJDEP in a October 17, 2001 letter (Ref. 5). According to the FS, selection of this method would allow groundwater that is not currently discharging to New York Harbor to eventually come into compliance with NJ GWQC prior to discharging (Ref. 6). The proposed remediation plan includes a monitoring program to track progress towards compliance. Details of the proposed monitoring plan are provided in the response to Question #7. Natural attenuation and monitoring are also proposed for OU20, where contaminated waters are currently discharging to the North Channel.

An application for the establishment of a CEA was submitted to NJDEP (Ref. 4). The CEA is an institutional control that designates an area that is currently, and is anticipated in the future, to be impacted above the NJ GWQC. The contaminants specified in the CEA include dissolved metals (aluminum, arsenic, manganese, iron and sodium), which have been attributed to the historic fill and saltwater intrusion, and organic contaminants (benzene, MTBE, #6 fuel oil, PCE, TCE, vinyl chloride, 1,2-dichloropropane, ethylbenzene, and 4,4-DDD), which have been attributed to site activities. The CEA covers the entire site and extends to the base of the fill unit. See the CEA Boundary, Figure 2-1 in the Application for the Designation of the CEA (Ref. 4) for an illustration of CEA boundaries. The dissolved metal concentrations are expected to remain elevated above the NJ GWQC for an indeterminate amount of time; therefore, the CEA duration for metals will be effectively permanent. The CEA duration for the organic contaminants is estimated at 18 years. The CEA emphasizes that the fill unit is not, and will not be, used for potable supply, and that discharges to New York Harbor will be minimal and will not significantly impact the ecological resources.

The CEA was submitted in May 2001, prior to presentation of the results from OU20 (Ref. 8) that estimated that contaminant concentrations in this area would persist at levels above the NJ GWQC for a duration of 29 years. The CEA should be revised to incorporate these data.

References:

1. Remedial Investigation Report, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated September 1998.
2. Draft Supplemental Remedial Investigation Report. Prepared by Ecology and Environment, Inc. Dated November 2000.
3. Draft Feasibility Study. Prepared by Ecology and Environment, Inc. Dated January 2001.
4. Application for Designation of a Classification Exception Area. Prepared by Ecology and Environment, Inc. Dated May 2001.
5. Letter from Robert Hayton, NJDEP, to Mirza Baig, MOTBY, re: Draft Feasibility Study Addendum, July 2001; Draft Proposed Remediation Plan, August 2001; Lead Base Paint (LBP)

Study, September 2001; Radiological Site Release Survey, August 2000; Military Ocean Terminal, Bayonne, Hudson County, New Jersey. Dated October 12, 2001.

6. Feasibility Study, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment. Dated October 2001.
7. Draft Decision Document for Nine Areas of Concern/Operable Units at Military Ocean Terminal, Bayonne, New Jersey. Prepared by Ecology and Environment. Dated December 2001.
8. Draft Supplemental Remedial Investigation Wells at Lots 95 and 205, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment. December 2001.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

__X__ If yes - continue after identifying potentially affected surface water bodies.

____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination"does not enter surface water bodies.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale:

Groundwater underlying OU20 (Lots 95 and 205) contains inorganic (iron, manganese, and sodium) and VOC (cis-1,2-DCE and vinyl chloride) concentrations in excess of NJ GWQC, as evidenced by analytical results from MW20-01 in November 2001 (Ref. 1). The elevated concentrations of iron, manganese, sodium were derived from the fill material. Impacted groundwater in this area is known to discharge to the North Channel of the Upper New York Bay, which is located approximately 80 feet to the north of MW20-01. It is estimated that the MW20-01 area has a catchment of 4.8 acres that discharges 1.2 to 1.7 million gallons of water per year along 520 feet of shoreline. There are no other areas that discharge groundwater with concentrations above NJ GWQC to surface water bodies. Two other monitoring wells, MW20-02 and MW20-03, were installed during the 2001 program. These wells were located 440 feet and 640 feet to the east of MW20-01, respectively, and did not exceed NJ GWQC for VOCs.

References:

1. Draft Supplemental Remedial Investigation Wells at Lots 95 and 205, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment. December 2001.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be "**insignificant**" (i.e., the maximum concentration[5] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or ecosystems at these concentrations)?

X	If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or ecosystem.
	If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.
	If unknown - enter "IN" status code in #8.

Rationale:

Table 3 summarizes those constituents detected in MW20-01 that exceed 10 times the NJ GWQC. These constituents include cis-1,2-DCE and vinyl chloride. However, it is estimated that the impacts to surface water would be negligible due to the large volume of water in the North Channel, the small mass of cis-1,2-DCE and vinyl chloride being discharged (0.07 kg/year and 0.4 kg/year, respectively (Ref. 1)), and the fact that the channel waters are already heavily impacted from regional industrial practices. The North Channel is part of the Upper New York Bay and is designated as a Saline Coastal (SC) waterway by NJDEP. The vinyl chloride concentration is well below the New Jersey Surface Water Quality Criteria (NJ SWQC) for SC waterways, as shown in Table 3. There are no NJ SWQC or Federal Ambient Water Quality Criteria (AWQC) for cis-1,2-DCE; however, the concentration in MW20-01 is only about 12 times the NJ GWQC and can be expected to decline further as groundwater travels toward the channel.

[5] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

Table 3 - Constituents that Exceed 10 times NJ GWQC and Discharge to Surface Water (µg/L)

Well	Contaminant	Concentration[1]	NJ GWQC	NJ SWQC (SC)
MW20-01	cis-1,2-DCE	118	10	no criteria available
	vinyl chloride	60	5	525

[1] Ref. 1.

References:

1. Draft Supplemental Remedial Investigation Wells at Lots 95 and 205, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. December 2001.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be **"currently acceptable**" (i.e., not cause impacts to surface water, sediments or ecosystems that should not be allowed to continue until a final remedy decision can be made and implemented[6])?

____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and ecosystems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment[7], appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialist, including an ecologist) adequately protective of receiving surface water, sediments, and ecosystems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

____ If no - (the discharge of "contaminated" groundwater cannot be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or ecosystem.

____ If unknown - skip to 8 and enter "IN" status code.

Rationale:

This question is not applicable. See response to Question #5.

[6] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[7] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

__X__ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale:

According to the FS, the proposed natural attenuation method will include a monitoring program to track the contaminant concentrations (Ref. 1). The proposed monitoring program includes the following:

- Groundwater monitoring of six wells with contaminant concentrations above NJ GWQC and nine downgradient wells, as summarized in Table 4
- Quarterly sampling and analysis for VOCs for the above-mentioned wells and pesticides at MW09-DM01
- Evaluation of the program after two years in accordance with NJAC 7:26E-6.3 to determine if additional action is necessary. The data will be analyzed by the Mann-Whitney U-test to assess the concentrations are decreasing in a pattern similar to that predicted.

Table 4 - Wells Included in the Proposed Monitoring Program

Wells with Contaminant Concentrations that Exceed NJ GWQC	Downgradient Wells
MW07-09	MW06-01 MW07-10
MW09-DM05	MW09-DM01 MW09-DM06
MW11-DM16	MW11-DM17 MW11-03
MW19-DM01	MW17-01
MW02-28	-
MW16-02	MW16-01 MW16-03

As discussed in the 2001 report for OU20 (Ref. 2), wells in the OU20 area that exceed NJ GWQC (MW20-01) should also be added to the monitoring program. There are no wells downgradient of MW20-01.

References:

1. Feasibility Study, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. Dated October 2001.
2. Draft Supplemental Remedial Investigation Wells at Lots 95 and 205, Military Ocean Terminal, Bayonne (MOTBY), Bayonne, New Jersey. Prepared by Ecology and Environment, Inc. December 2001.

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

__X__ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Military Ocean Terminal, Bayonne, Hudson County, New Jersey, EPA ID#NJ0210022752. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

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

Completed by: _____ Date:_____
Lucas Kingston
Hydrogeologist
Booz Allen Hamilton

Reviewed by: _____ Date:_____
Pat Shanley
Geologist
Booz Allen Hamilton

Also Reviewed by: _____ Date:_____
Alan Straus, RPM
RCRA Programs Branch
USEPA Region 2

_____ Date:_____
Barry Tornick, Section Chief
RCRA Programs Branch
USEPA Region 2

Approved by: original signed by: Date: 8/7/2002
Raymond Basso, Chief
RCRA Programs Branch
USEPA 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, and the NJDEP Office located at 401 East State Street, Records Center, 6th Floor, Trenton, New Jersey.

Contact telephone and e-mail numbers: Alan Straus, USEPA RPM
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Attachments

The following attachments have been provided to support this EI determination.

- Attachment 1 - Summary of Media Impacts Table

Attachment 1 - Summary of Media Impacts Table

Military Ocean Terminal (MOTBY)

OU	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	CONTAMINANTS
OU5 Facility-wide Groundwater (OU2, OU7, OU9, OU11, OU16, OU19, OU20)	Yes	No	No	No	No	No	No	▸ Natural groundwater remediation ▸ Groundwater monitoring ▸ CEA	VOCs, pesticide (4,4-DDD), metals
OU7 Area 44C Boiler Building	No	No	Yes	No	No	Yes	No	▸ Excavation and off-site disposal of petroleum contaminated soils ▸ Deed notice	PAH, PCBs, pesticide (aldrin), TPH
OU9 Landfill/North Fill Area and Former Navy Drum Storage	No	No	Yes	Yes	Yes	Yes	No	▸ 18-inch cap and 6-inch erosion layer for landfill ▸ Landfill closure ▸ Deed restrictions to non-residential use ▸ Signs ▸ Fencing	PAHs, pesticides, metals
OU11 DRMO Storage Area	No	No	Yes	No	No	Yes	No	▸ Deed notice ▸ Asphalt cap ▸ Excavation and removal of PCB hotspots ▸ Biannual review	PAHs, PCBs, metals
OU17 Railroad Classification Yard	No	No	Yes	No	No	No	No	▸ Deed notice ▸ 12-inch cover	PCBs, pesticide (dieldrin), metals
OU20 Waste at Lots 94, 95, 205	No	No	Yes	No	No	Yes	No	▸ Deed notice ▸ 18-inch soil cover / asphalt cover	PAHs and metals
OU23 Facility-wide PCBs	No	No	Yes	No	No	Yes	No	▸ Asphalt cap ▸ Deed notice ▸ Excavation and off-site removal of soils with PCB levels above 50 mg/kg	PCBs

OU	GW	AIR (Indoors)	SURF SOIL	SURF WATER	SED	SUB SURF SOIL	AIR (Outdoors)	CORRECTIVE ACTION MEASURE	CONTAMINANTS
Miscellaneous soils Group 1 OU2, OU7, OU10, OU12, OU13, OU14, OU15 (SA52 in OU6), OU20	No	No	No	No	No	Yes	No	▸ Deed notice ▸ Repair existing pavement ▸ Asphalt cap	PAHs, metals, pesticides, TPH generally 1 to 4 times the NRDCSCC, 2 feet or greater below the surface
Miscellaneous soils Group 2 OU10, OU12, OU16	No	No	Yes	No	No	No	No	▸ Deed notice ▸ Repair existing pavement ▸ Asphalt cap ▸ Excavation and off-site removal of soils with PCB levels above 50 mg/kg	PAHs, metals, pesticides, TPH, PCBs generally 4 to 10 times the NRDCSCC, at the surface