ROY F. WESTON, INC.

SECTION 4M/6J
REMEDIAL INVESTIGATION REPORT
ROUTE 21 FREEWAY EXTENSION

Volume I of II

WESTON®
MANAGERS DESIGNERS CONSULTANTS

SECTION 4M/6J
REMEDIAL INVESTIGATION REPORT
ROUTE 21 FREEWAY EXTENSION

Volume I of II

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SECTION 1.0

INTRODUCTION

1.1 PROJECT OVERVIEW

The New Jersey Department of Transportation (NJDOT) has retained Roy F. Weston, Inc. (WESTON®) to conduct a site contamination investigation along the proposed Route 21 Freeway Extension located within Passaic and Bergen counties. To date, three distinct phases of the investigation have been performed by WESTON. The first two phases (referred to as Task I and Task II) included site screening and limited sampling. These phases are described in more detail later in this section. The third phase (referred to as Task III) consisted of the implementation of Remedial Investigations (RIs) at 24 properties with areas of environmental concern (AECs) located along the proposed Route 21 Freeway Extension. This RI Report describes the activities that took place at 14 of the 24 properties (Sites 1-3, 5-14 and 25) which are located in the City of Passaic and the City of Clifton, New Jersey.

The initial screening phase of the investigation, referred to as Task I, identified 110 commercial, industrial, state, county and municipally owned properties along the 1.8 miles of proposed right of way (ROW). This task was conducted by WESTON in 1989 and 1990. Based on an extensive data compilation and review, and on site surveys, these properties were ranked according to their potential for environmental concern. The results of the Task I investigation ranked 21 properties with a high potential for environmental concern. The findings of this investigation were reported in "Site Contamination Screening Report" (WESTON, 1990).

The Task II screening investigation, conducted by WESTON in 1991 and 1992, involved environmental sampling within the properties ranked with a high potential for environmental concern. The purpose of the screening investigation was to verify the presence or absence of contamination at the respective sites. The investigation included the collection of approximately 100 soil samples and 4 sediment samples which were analyzed for United States Environmental Protection Agency (USEPA) priority pollutant compounds. The results confirmed the presence of priority pollutant compounds in soils in excess of the New Jersey Department of Environmental Protection (NJDEP) Proposed Cleanup Standards (N.J.A.C. 7:26D) at 20 sites with AECs. The results of this investigation were reported in "Task II Site Contamination Screening Investigation" (WESTON, 1992). Based on these results, NJDOT proceeded with RIs at each site. The adoption of new NJDEP Soil Cleanup Criteria in February 1994, realignment of portions of the proposed roadway, and review of additional historical site-use information has increased the number of sites requiring RIs to 24.

Due to varied construction schedules for portions of the proposed freeway extension, the 24 sites under investigation are divided into three distinct phases. These phases will be referred to as the Crooks Avenue Interchange/Route 46 Bridge sites (3 sites), the Hope Avenue to Dayton Avenue sites (7 sites) and the Section 4M/6J sites (14 sites). To date, RIs have been completed for the three Crooks Avenue Interchange/Route 46 Bridge sites. Site 8, which is included in Section 4M/6J, has been targeted for an accelerated RI schedule. The accelerated RI schedule at Site 8 was designed to accommodate the selection of this site as a proposed dewatering location for sediments to be dredged from the Passaic River and Dundee Canal as part of the Crooks Avenue Interchange/Route 46 Bridge.

As previously stated, this Remedial Investigation Report addresses the Section 4M/6J sites. Section 1.0 provides an overview of the Route 21 Freeway Extension Project; Section 2.0 describes the land use and the environmental setting of the study area; Section 3.0 discusses the implementation of the RIs and provides results of the investigations; and Section 4.0 presents conclusions and recommendations.

1.2 REMEDIAL INVESTIGATION APPROACH

WESTON utilized current NJDEP guidance on conducting the site investigations, while performing the RI, and while preparing the RI report. Current guidance includes "Technical Requirements for Site Remediation Proposed New Rules" (N.J.A.C. 7:26E) and NJDEP's "Field Sampling Procedures Manual" (May 1992). All activities conducted as part of the RIs adhered to the NJDEP approved "Section 4M/6J Remedial Investigation Work Plan" (March 1994).

The Section 4M/6J sites are located within the proposed ROW for the Route 21 Freeway Extension. The section consists of Sites 1-3, 5-14, and 25. Soil borings were conducted at sites 1, 3, 12 and 25. Sediment and surface water sampling in the Dundee Canal was performed at sites 2, 9, and 11.

Based on the nonresidential nature of the proposed freeway, NJDOT initially applied the NJDEP nonresidential direct contact soil cleanup criteria (NRDC) as well as the impact to groundwater (IGW) soil cleanup criteria to all soils analyzed. Comparisons have also been made to the residential direct contact (RDC) soil cleanup criteria to evaluate the need for engineering and institutional controls at sites where contaminants were found. Currently, no IGW soil cleanup criteria exist for target analyte list (TAL) inorganics. Therefore, the RDC and NRDC soil cleanup criteria were used for evaluation of soil samples analyzed for TAL inorganics. This approach has been utilized during RIs performed at the remaining 10 sites.

Analytical results for sediment samples were compared with the biological effects screening levels presented in the NJDEP "Guidance for Sediment Quality Evaluations," March 1991. The "Effects Range - Low" (ER-L) and "Effects Range-Medium (ER-M) qualitatively represent concentrations above which adverse effects to aquatic life may occur.

Waste classification uses indicators and criteria provided in the NJDEP "Hazardous Waste Regulations", (N.J.A.C. 7:26). Surface water analytical results were evaluated in relation to the NJDEP, "Surface Water Quality Standards, "(N.J.A.C. 7:9B).

A geophysical survey was performed at Site Nos. 3 and 10 for the purpose of identifying anomalies associated with the presence of underground storage tanks (USTs). A method summary for the geophysical investigation is contained in Appendix A. Field observations at both sites and subsequent intrusive investigations at Site 10 are discussed in Section 3.0.

NJDOT currently owns 5 of the 14 sites located within Section 4M/6J. The remaining sites are owned by separate parties including the Parkstein Company (Sites 1 and 3), Dundee Water and Power Company (Sites 2, 9, 11 and 13), Conrail (Site 6), Chelton Realty (Site 7), and Jean Ribbon Mills (Site 25). Access to NJDOT-owned properties was unrestricted. Access to the remaining properties was obtained through notification of the owners by NJDOT.

WESTON's implementation of the work plan was observed by representatives of Dan Raviv Associates, Inc. of Millburn, New Jersey, at Sites No. 1, 2, 3, 9, 11 and 13. Dan Raviv also collected split samples. Dan Raviv Associates, Inc. was employed by the property owners to perform this task.

Investigations at Site Nos. 5, 6 and 7 were limited to visual inspections to identify the presence of staining. Based on the site evaluations no samples were collected. The Remedial Investigation Work Plans for these sites were amended by WESTON's letter dated 18 May 1995, during the investigation phase.

SECTION 2.0

LAND-USE AND ENVIRONMENTAL SETTING

2.1 LOCATION

The proposed Route 21 Freeway Extension will extend the existing Route 21 Freeway from its present terminus at Monroe Street in the City of Passaic to Route 46 in the City of Clifton. The proposed 4-lane freeway will pass through portions of Passaic, Paterson, Clifton, and Elmwood Park, located within Passaic and Bergen counties. The proposed extension is approximately 1.8 miles in length. The 14 sites (Sites 1-3, 5-14 and 25) within Section 4M/6J are located throughout the center section of the proposed extension. A location map for the proposed freeway extension and the seven sites is provided in Figure 2-1.

2.2 LAND USE SURVEY IMPLEMENTATION AND SUMMARY

A survey was conducted to evaluate both historical and current land use in the vicinity of the sites. Information obtained from the survey was evaluated to identify sites and more specifically, areas of potential environmental concern. The following subsections provide a summary of the implementation and results of the survey. More detailed, site-specific information is provided in Section 3.0.

2.2.1 Historical Land Use

The following sources were reviewed to assist in the characterization of both historical and current land use:

- aerial photographs for the years 1940, 1951, 1961 and 1974;
- U.S.G.S. 7.5 minute topographic maps (Weehawken, Paterson);
- NJDEP land use maps (Sheet 26, 1955);
- Sanborn fire insurance maps from 1894 to the present;
- field reconnaissance (1990-1992);
- MacRae's Industrial Directory;
- VISTA Environmental Information, Inc. Database;
- historical site maps, when available by the owner or obtained from an NJDEP file review; and
- chain of title searches.

All available historical Sanborn fire insurance maps were reviewed to determine past land use in the vicinity of the sites. Maps were reviewed from the years 1894 to 1991. Aerial photographs from the years 1940, 1951, 1961 and 1974 were obtained and reviewed to assist in identifying historical land use. These photographs were enlarged to a scale of 1 inch equal

to 200 feet. The historic documentation, and the corresponding maps, suggest that the entire Route 21 Freeway Extension Project area has been primarily industrial/commercial since before the turn of the century. Detailed descriptions of the site conditions depicted by the aerial photographs and Sanborn maps for the 14 sites included in this Report are presented in Section 3.0.

2.2.2 Current Land Use

Sites 1-3, 5-14, and 25 lie within the area from Dayton Avenue in Passaic, New Jersey to Route 46 just south of the Crooks Avenue Interchange in Clifton, New Jersey. Sites 5, 8, 10, 12, and 14 are NJDOT-owned vacant lots. The sites are surrounded primarily by commercial, industrial and residential areas. Unauthorized dumping has occurred on the vacant lots. More detailed information concerning site usage is provided in Section 3.0.

To supplement the information obtained in the Task II investigation, a thorough historical review and additional site inspections were performed. This information was evaluated to identify additional AECs which may be present as a result of current and historical uses of the sites. As mentioned in Section 2.2, records reviewed included Sanborn maps from the years 1894 to 1991. In addition, historical aerial photographs from the years 1940 , 1951, 1961, and 1974 were reviewed. The photographs were black and white film, positive at a scale of one inch equals 200 feet. Title searches were also obtained for a majority of the 24 sites to determine ownership histories. The MacRae's Industrial Directory was also reviewed for ownership information and land use information. In addition, WESTON reviewed Federal and State regulatory databases obtained from VISTA Environmental Information, Inc. (VISTA). The VISTA regulatory database information and NJDEP file review information have also been incorporated into these RI reports.

2.2.3 Regulatory Agency Review of Properties

A variety of state and local regulatory sources/contacts were utilized for data collection. Primary contacts included various departments within NJDEP and the health departments of Clifton and Passaic, New Jersey. These sources were contacted for information concerning violations, enforcement actions, and general environmental impacts associated with the current and previous owners of the property. A file search was also requested to review applicable NJDEP environmental files. The NJDEP confirmed that no agency files existed for the 24 sites. The regulatory review was continued from the Task I through the Task III effort.

WESTON reviewed Federal and State regulatory databases obtained from VISTA Environmental Information, Inc. (VISTA). This information was provided in WESTON's Task II report. Regulatory agency lists were reviewed for sites within a ¼-mile radius of the ROW for environmental compliance information, which included USEPA Superfund Sites, USEPA Resource Conservation and Recovery Act (RCRA) Treatment, Storage and/or Disposal Sites, Consolidated Docket System and RCRA Major Violators, USEPA potential Superfund Sites,

NJDEP Leaking Underground Storage Tank list, and the NJDEP Solid Waste Facility Directory, USEPA RCRA Hazardous Waste Generator, USEPA RCRA Transporters, and the NJDEP UST database. WESTON's "Site Contamination Screening Report" (1990) provides details of the implementation and results of this review.

2.3 ENVIRONMENTAL SETTING

The following subsections provide a description of the environmental setting of the entire Route 21 Freeway Extension Project area. A discussion of topography, surface water quality and ecology, floodplain areas, wetland areas, stormwater management, geology, soils, hydrogeology, and groundwater quality is presented. The environmental setting for individual sites is provided in Section 3.0. References utilized are provided in Appendix G.

2.3.1 Topography

The Route 21 Freeway Extension Project area is located within the Piedmont Lowland section (glaciated portion) of the Piedmont physiographic province (Carswell and Rooney, 1976; Wolfe, 1977). The regional topography is dominated by the First Watchung Mountain to the west and the Hackensack River Meadowlands to the east. The topographic elevations vary from approximately 550 feet above mean sea level (MSL) at the summit of the First Watchung Mountain to less than 10 feet MSL in the Hackensack River Meadowlands.

The Passaic River extends through a water gap in the First Watchung Mountains area, northwest of Paterson, New Jersey. A map showing the general environmental setting of the study area is presented in Figure 2-2. From the water gap, the river flows northeast to the vicinity of Fair Lawn, where it shifts and flows southward passing to the east of Paterson, Clifton and Passaic. In the vicinity of the project area the Passaic River flows approximately north-south between the Route I-80 Interchange and Route 46 Interchange (see Figure 2-1). At the Route 46 Interchange, the river bends and flows to the southeast passing to the east of the current Route 21 terminus. A small lake known as Dundee Lake is formed by Dundee Dam, which is located approximately midway along the length of the Route 21 Freeway Extension Project area. The area adjacent to the project is characterized by swell and swale topography.

2.3.2 Surface Water Quality and Ecology

The Route 21 Freeway Extension Project area lies within the Lower Passaic River Watershed. The western and southern limits of this watershed are beyond the boundaries of the sites. This section is defined as that section from the Pompton River confluence downstream to Newark Bay (NJDEP, 1988) including parts of Bergen, Hudson, Passaic and Essex Counties. The major tributaries include the Saddle River, the Second River, and the Third River. The confluences of these three tributaries within the Passaic River are all located at or downstream from the Route 21 Freeway Extension Project area. The waters of the Lower Passaic River and its

tributaries are classified as FW-2 Trout Production, FW-2 Trout Maintenance (in the Saddle River watershed), FW-2 Nontrout, SE-2, and SE-3.

The Lower Passaic River flows through a densely populated, urbanized and industrialized region. As a result, the water quality conditions are reflective of numerous point sources and significant nonpoint source contributions. Ambient water quality monitoring of the Lower Passaic River was performed by NJDEP at the Little Falls and Singac gauging stations, and at locations adjacent to Elmwood Park (NJDEP, 1988). These monitoring stations are located upstream from the proposed Route 21 Freeway Extension Project area.

Water quality in the Lower Passaic River was evaluated at three monitoring stations from 1983 to 1987 (NJDEP, 1988). The water quality varied from fair quality at Singac to good at Little Falls and poor at Elmwood Park. The improvement in river water quality at Little Falls is likely due to in-stream aeration caused by a number of small waterfalls in the river. Problems in the river included excessive fecal coliform, in-stream oxygen demand and nutrient concentrations. All three Passaic River monitoring stations contained concentrations of total phosphorus averaging from 0.36 to 0.44 milligrams/liter (mg/L), with nearly all samples containing excessive amounts (NJDEP, 1988). Total inorganic nitrogen was also elevated, averaging 2.5 mg/L at the three locations. Un-ionized ammonia was elevated in the Passaic River at Little Falls during low-flow periods. Dissolved oxygen (DO) concentrations were above the 4.0 mg/L NJDEP standard in all measurements obtained from the Lower Passaic River. DO saturation periodically fell below 80 percent at all three locations. Biochemical oxygen demand (BOD) occasionally approached 10 mg/L in the Lower Passaic River. Conditions in the river tend to be poorest during low-flow periods.

Surface water within the Dundee Canal and Passaic River in the immediate vicinity of the Route 21 Freeway Extension Project area will be evaluated as part of future RI activities along the proposed Route 21 Freeway Extension.

2.3.3 Floodplain

The Route 21 Freeway Extension may encroach upon three floodplain areas. These areas include Weasel Brook, located at the southern terminus of the proposed freeway in the area of Sites 18-23; the Dundee Canal; and the banks of the Passaic River.

The Route 21 Freeway Extension will intersect Weasel Brook at a perpendicular angle. The NJDEP has delineated a flood hazard area approximately 60 feet in width where Weasel Brook will be intersected by the freeway. Weasel Brook either crosses or is located immediately adjacent to Sites 18 through 23. This is a heavily developed area with extensive paving and therefore, may have limited natural floodplain values.

The 100-year floodplain along the Dundee Canal in Clifton, New Jersey is basically contained within the channel. The Flood Insurance Rate Map (FIRM), published by the U.S. Department of Housing and Urban Development, for the portion of the canal associated with Sites discussed in this report does not designate a 100-year floodplain associated with that part of the canal. The natural and beneficial floodplain values include floodwater storage and wildlife habitat.

Most of the project area will longitudinally encroach upon the NJDEP delineated flood hazard area of the Passaic River along its western bank (see Figure 2-1). In much of the area, the floodplain is contained within the channel of the river. The width of the flood hazard area (including the floodway) within the project area ranges from approximately 430 to 2,200 feet, with the widest area being designated in Elmwood Park, New Jersey. The ramps from River Drive to northbound Route 46 and from Route 46 to southbound River Drive will also encroach upon the flood hazard area. The widening of the Route 46 Bridge will constitute a perpendicular encroachment. The flood hazard area (including the floodway) is approximately 580 feet wide in this area. The base flood elevation (from a 100-year storm) in the project area ranges from approximately 21 to 23 feet downstream of the Dundee Dam and from approximately 33 to 34 feet upstream of the Dundee Dam.

The Passaic River floodplain includes developed areas, wooded areas, a golf course, and wetlands. Although a large portion of this area is developed, the undeveloped portions of the floodplain provide natural and beneficial values which include flood storage, wildlife habitat, and pollution abatement.

2.3.4 Wetlands

As defined by the United States Army Corps of Engineers (USACE), wetlands are those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adopted for life in saturated soil conditions (33 CFR 328.3(b)). According to the USACE, an area must meet the following three criteria in order to be delineated as a wetland:

1. The prevalent vegetation consists of hydrophytes;
2. Soils are present and have been classified as hydric or possess characteristics that are associated with anaerobic soil conditions; and
3. The area is inundated either permanently or periodically at mean water depths $\leq$ 6.6 feet, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation.

Wetlands in the vicinity of the Route 21 Freeway Extension Project were fully evaluated and delineated by the NJDOT in 1987 (see NJDOT, 1987). Four primary areas of wetlands were identified along the proposed project area. These areas are depicted on Figure 2-2 and are designated as WL-1, 2, 3 and 4.

2.3.5 Stormwater Management

The bulk of the stormwater from the proposed extension will drain into the Passaic River or the Dundee Canal via sheet flow runoff. Most stormwater from the Section 4M/6J sites (Sites 1-3, 5-14 and 25) flows to Dundee Canal, or percolates into the subsurface. There are, however, several controlled stormwater drainage systems which are maintained by the cities of Clifton and Passaic and by the NJDOT along Route 46.

The City of Passaic discharges stormwater into the Passaic River at seven locations. Six discharge points drain stormwater from relatively short sections of the following streets: Monroe, Mercer, Essex, Wall, South, and Eighty. There are two small systems which discharge into the Dundee Canal. These systems are located at Morris and Virginia Streets, respectively. There is an open drainage stormwater system which passes from Clifton into Passaic near the intersection of Highland Avenue and Davidson Street. This drainage channel extends toward the southeast and then south along Parker Avenue to the vicinity of the Parker Avenue - Monroe Street intersection. At this location the stormwater enters a culvert which drains into an open channel near the southern terminus of Hope Avenue. This open channel drains into the Passaic River.

The southern end of the Dundee Canal is hydraulically connected to the Passaic River via a culvert system which parallels First Street. The discharge point into the Passaic River is located beneath the Market Street bridge.

2.3.6 Geology

The Route 21 Freeway Extension Project is located within the Piedmont Lowland section (glaciated portion) of the Piedmont physiographic province (Carswell and Rooney, 1976 and Wolfe, 1977). The rocks of the Triassic Age that underlie the southern one-third of Passaic County and the project area are of the Brunswick Formation (Carswell and Rooney, 1976). This formation is a part of the Newark Group. The Newark Group consists of Triassic Age sediments which occupy a northeast-southwest trending structural trough which extends diagonally across northern New Jersey. This trough is known as the Newark Triassic Basin. During Triassic time, the sedimentary deposits of the Newark Triassic Basin were intruded by large volumes of molten basalt. These bodies of basalt comprise the Watchung Mountains. The Brunswick Formation forms broad valleys between the Watchung Mountains and occupies the gently rolling lowlands east of the First Watchung (Carswell and Rooney, 1976). The Brunswick Formation consists of alternating beds of reddish-brown mudstone, siltstone and sandstone.

The rocks directly beneath the Route 21 Freeway Extension are classified as the "Passaic Member" of the Brunswick Formation. The Passaic Member represents the oldest stratigraphic unit of the Brunswick Formation. The contact between the Passaic Member of the Brunswick Formation and the underlying Lockatong Formation is gradational. The formation contact is

defined as the position at which red beds make up more than 50 percent of the section (Houghton, 1986). The dominant rock type of the Passaic Member is red, fine-grained sandstone and siltstone, which accounts for 60 percent of the unit. The remainder of the unit is primarily mudstone, a nonfissile equivalent of shale (Houghton, 1986). This unit generally becomes finer from bottom to top, with more mudstone and less siltstone occurring at the higher levels within the unit. Although there are few descriptions of bedrock for the Route 21 Freeway Extension Project area in literature reports, scattered outcrops of red sandstone are reportedly found in Clifton and Passaic (Salisbury, 1902).

Bedrock within this region is overlain by stratified drift and glacial till which was deposited during the Wisconsin glacial stage of the Pleistocene epoch. In general, these unconsolidated to poorly consolidated deposits are less than 20 feet thick, although a thickness of up to 62 feet has been reported in the area (Salisbury, 1902). Information obtained from recent geotechnical borings conducted as part of the Route 21 geotechnical drilling project indicated that bedrock was encountered between 25 and 90 feet below ground surface (bgs). Adjacent to the river, depths to bedrock ranged from 25 to 30 feet bgs, and near the terminus of the canal, in the City of Passaic, depths to bedrock reached 90 feet bgs.

2.3.7 Soils

A soils map presenting the various soil types in the vicinity of the Route 21 Freeway Extension Project is presented in Figure 2-3. By far, the majority of the soils in the area are associated with the Urban land-Riverhead and Urban land-Boonton complexes. Riverhead soils make up 20 to 60 percent of the Urban land-Riverhead complex. Slopes are predominantly 3 to 8 percent. Extensive areas are paved or contain structures. The soil materials are stratified and sorted, cobbly or gravelly, coarse-textured glacial outwash materials composed mostly of granitic gneiss, sandstone, or shale fragments.

The soils in the vicinity of the 4M/6J sites are predominantly of the Urban land-Boonton complex (UrB). Boonton soils make up 20 to 60 percent of each mapped area of the Urban land-Boonton complex. Extensive areas are overlain by pavement or structures. Slopes are predominantly 3 to 8 percent, but some areas have been leveled or are steep edges of cuts or fills. The soil materials consist of mostly gravelly glacial sediments derived from shale, sandstone, basalt, and granitic materials. Cobbles and gravels are common throughout with occasional boulders in some areas.

The soils along River Drive consist of the Dunellen and Riverhead-Urban land complex which is approximately 55 percent Dunellen soils, 30 percent Urban land, and 15 percent other soils. Slopes range from 4 to 12 percent but are predominantly 5 to 10 percent. The impervious surface of the Urban land component consists of buildings and paved driveways and walkways. The Dunellen soils contain loam at the surface and sand and loam in the substratum. Permeability is moderate or moderately rapid in the subsoil and rapid in the substratum. In the Dunellen soils, the water erosion hazard is moderate to severe.

2.3.8 Hydrogeology

The Brunswick Formation is the major source of groundwater for industrial use. Most potable water is supplied by the Passaic Valley Water Commission from the surface water reservoirs and the Passaic River. The water treatment plant is located in Little Falls, New Jersey. Groundwater use in the project area may be limited to industrial or irrigation purposes. A well search within one-half mile of the project area was performed prior to the RI efforts.

The Lockatong and Brunswick Formations form a continuous series between two end member lithologies (Houghton, 1986). The low-yielding end member is represented by massive, hard, red siltstone in the Brunswick Formation. Groundwater in this unit is stored in near-vertical, bedding-plane joints, and in the minimal pore space present in the rocks (mostly in the range 0.5 to 3.5 percent). Water is transmitted through the joint systems. As a result, wells drilled in the massive lithology have low yields, low specific capacities (large drawdown for a given yield), and high groundwater flow velocities.

The high flow velocities in these rocks are caused by the low bulk porosity (and low specific yield) and high permeability of open fractures. Flow rates on the order of tens of feet per day are possible in the hard, fractured rocks. The direction of groundwater flow in this lithology is strongly influenced by the orientation of the principal joint sets. The main fractures are usually high-angle (normal to bedding plane) joints, typically spaced 10 centimeters (cm) to 1 meter (m) apart. The high-angle joints occur in sets which are commonly oriented parallel to the strike of the formation. One or two joint sets are most common; three or more cross-cutting sets may occur along fold axes or near major faults.

The high-yielding end member lithology is represented by a soft, hackly weathering or fissile mudstone to shale. Mudstone is the second most abundant lithology in the Brunswick Formation and comprises much of the upper two-thirds of the formation. Where mudstone occurs alone, the hydraulic properties are similar to an unconsolidated formation with a high clay content. Groundwater flow is nearly isotropic, but very slow (one foot per day or less). Where mudstone or shale occurs interbedded with siltstone, sandstone or argillite, the mudstone forms the aquifer. Fracture porosity in the mudstone is at least an order of magnitude higher than that of the harder lithologies, producing very high anisotropy in interbedded sections.

In parts of the basin where hard siltstone, sandstone or argillite make up a significant part of the section, joint-controlled flow of groundwater will be a factor in determining direction and velocity of flow. Principal joint sets almost always form an acute angle to the strike of bedding. In areas where there is little difference in lithology in the stratigraphic section, fracture control of groundwater movement is probably dominant.

Surface flow can be considered to be controlled by topography and manmade features. Flow in the unsaturated zone is typically controlled by both topography and fracture orientation where rock is relatively uniform, or by topography and dip direction where rock layers have heterogeneous flow characteristics. In the project area, the general direction of groundwater flow is expected to be eastward toward the Passaic River. Groundwater recharge may be high in areas where there are fractures in the bedrock. It is not known where fractures occur in the project area, although valley areas, such as the project area, generally are not considered primary recharge areas (Carswell and Rooney, 1976).

2.3.9 Groundwater Quality

The quality of groundwater in the Brunswick Formation differs from other aquifers in Passaic County. It is generally much more mineralized (Carswell and Rooney, 1976). Groundwater from this formation is moderately to very hard, which is due mainly to the presence of calcium and magnesium sulfate minerals in the rocks.

However, in some areas, particularly the more industrialized and urbanized parts of the county, the natural quality of groundwater in the Brunswick Formation has been degraded. Wells have been found to be contaminated by industrial wastewater (Carswell and Rooney, 1976), and not suitable for potable supply.

Groundwater in the vicinity of the Route 21 Freeway Extension Project is classified as a Class IIA in the NJDEP Water Technical Programs technical guidance document and in the "Groundwater Quality Standards" (N.J.A.C. 7:9-6, February 1993). The primary designated use for Class IIA groundwater is potable water or conversion to potable water. Class IIA secondary uses include agricultural water and industrial waste. However, the potential exists for the area surrounding the project area to be classified by NJDEP as Class IIB in the future. Class IIB groundwater exhibits evidence of past discharges of pollutants. The designated use of Class IIB groundwater includes any reasonable use other than for potable water. Currently, there are no areas in New Jersey in which groundwater has been classified as Class IIB.

SECTION 3.0

SUMMARY AND RESULTS OF THE REMEDIAL INVESTIGATIONS

The site-specific RI summaries for the Section 4M/6J sites (Sites 1-3, 5-14 and 25) are presented in the following subsections. Maps depicting site features and sample locations are provided in Figures 3-1 through 3-16. These figures are located in Appendix B.

Sampling activities conducted as part of the RIs were consistent with NJDEP's document entitled "Technical Requirements for Site Remediation "(N.J.A.C. 7:26:E) and NJDEP's document entitled "Field Sampling Procedures Manual" (May 1992). Activities conducted as part of the RIs adhered to the NJDEP approved "Section 4M/6J Remedial Investigation Work Plan" (March 1994) and the "Addendum to the Approved Work Plan 4M/6J Sites" (May 1995). The Site 3 sampling strategy was revised in the field to accommodate changed conditions.

The site-specific RI summaries consist of the following:

- Property Description
- Site History
- Environmental Setting
- Description of AECs
- Implementation of the RI
- Results of the RI
- Nature and the Extent of Contamination

A summary of analytical results is provided in Appendix C. Analytical results for soil boring samples were compared to NJDEP's Soil Cleanup Criteria (February 1994). Analytical results from soil samples were compared to RDC soil cleanup criteria and the soil cleanup criteria. The more stringent of the criteria were applied. Since no IGW soil cleanup criteria have been established for TAL inorganics, the TAL results have been compared to RDC and NRDC soil cleanup criteria.

Analytical results for sediment samples were compared to the biological effects screening levels, presented in the NJDEP, "Guidance For Sediment Quality Evaluation," March 1991.

Surface water samples were evaluated referencing the NJDEP, "Surface Water Quality Standards," (N.J.A.C. 7:9B).

Waste classification analytical results were compared to NJDEP, "Hazardous Waste Regulations," (N.J.A.C. 7:26).

3.1 SITE 1 - PARKSTEIN COMPANY, BLOCK 52/LOT 19

3.1.1 Property Description

Block 52, Lot 19 (Site 1) is currently an active commercial property located at 40-46 Morris Street in Passaic, New Jersey. The property, owned by Parkstein Company, is an active scrap metal yard formerly known as B.Y. Industries. The site is now occupied by American Scrap Iron and Metal, Inc. The Standard Industrial Classification (SIC) code for the site is #5093, designated as an establishment primarily engaged in assembly, breaking up, sorting, and wholesale distribution of scrap and waste materials. The property encompasses approximately 0.7 acre. The site is enclosed by a 15- to 20-foot-high sheet metal fence.

The site is situated within a mixed residential and industrial community. The adjacent property, to the southwest, was historically utilized as a scrap yard and is included within the Route 21 investigation (Site 3). An abandoned Conrail railroad line is located to the north and west of both Site 1 and Site 3. The Dundee Canal lies approximately 30 feet northwest of the railroad bed. Residential properties abut the site to the east and south.

3.1.2 Site History

The site operated as a scrap yard from approximately 1935 to the present. The following summaries detail the history of the site and surrounding properties. This information was obtained from a review of historical aerial photographs and Sanborn maps.

- 1894 - Sanborn Map

  Based on the information provided from the 1894 Sanborn map, the property consisted of vacant land in 1894. The site was bordered to the northwest by the N.Y. Susquehanna and Western Railroad. The rail bed was bordered to the northwest by the Dundee Canal. The remainder of the site was surrounded by vacant land with the exception of the Eagle Iron & Brass Foundry located to the northeast.

- 1899 - Sanborn Map

  There were no significant changes within the site or surrounding area between 1894 and 1899.

- 1903 - Sanborn Map

  There were no significant changes within the site since 1894. Residential apartments and commercial establishments were constructed to the east of the site. A church was also constructed to the southeast. Based on the information provided by the 1903 Sanborn map,

no additional industrial establishments other than the Eagle Iron & Brass Foundry were present.

- 1910 - Sanborn Map

The 1910 Sanborn map indicates that the site underwent no significant changes and remained vacant through 1910. There were two alterations to surrounding areas between 1903 and 1910. A small cigar factory was constructed to the south of the site (across Morris Avenue) and a machine shop was incorporated into the foundry operations.

- 1935 - Sanborn Map

The information provided on the 1935 Sanborn map indicates that development occurred within the site between 1910 and 1935. Two aboveground storage tanks, one containing gasoline, and a set of truck scales were depicted in the southwestern portion of the site. A small office building was constructed adjacent to the scales. These improvements were presumably associated with the start-up of the scrap yard and trucking operation.

- 1940 - Aerial Photograph

Review of the 1940 aerial photograph indicates that the site consists of a vacant lot with an abundance of miscellaneous debris, consistent with the appearance of a scrap yard or junkyard. Parked trucks, the office structure, and disturbed earth were evident. A rail spur extended from the main railroad track to the center of the property.

A vacant lot located to the southwest of the site, Site 3, also appears to be utilized as a junkyard. A wall was constructed along the western property boundary, between the railroad line and the site.

- 1951 - Sanborn Map

Information provided by the 1951 Sanborn map indicates that the site features remained unchanged between 1935 and 1951. The site is identified as a junkyard on the map.

- 1951 - Aerial Photograph

There were no significant changes within the site since the 1940 aerial photograph.

- 1961 - Aerial Photograph

An abundance of debris piles within the site indicates an increase in activity.

- 1974 - Aerial Photograph

The site remains an active scrap yard or junkyard. Site 3 has been paved and appears to be utilized as a parking lot.

- 1979 - Sanborn Map

Information provided by the 1979 Sanborn map indicates no change in site usage.

At the time of Task II sampling, the property was vacant. Recent visits to the site indicated that the property is currently utilized to wreck and store junk cars. Since the Task II sampling effort, a concrete pad has been constructed between the hydraulic compactor and the weigh station. The pad has been outfitted for the stripping of automobiles brought to the site on a daily basis.

3.1.3 Environmental Setting

WESTON and NJDOT representatives conducted a site inspection of this property in 1991. At the time of the inspection, a concrete pad was present within the center portion of the property. The remainder of the property was unpaved. Although the site topography was essentially flat, most of the surface water runoff generated during storm events appeared to flow northwest toward the Dundee Canal. An embankment was positioned between the canal and the site which channels flow to a drainway located immediately north of the site. The drainway discharges to the canal.

Overburden encountered during soil boring activities conducted during the RI investigations conducted at the site was comprised primarily of fill material consisting of silt, sand, and gravel. The fill encountered within the borings was frequently stained. During the Task II investigation, groundwater was encountered at approximately 8 feet below ground surface (bgs). Groundwater was not encountered during the RI, despite advancing one boring to a depth of 22 feet. Groundwater flow direction is presently unknown; however, general topographic features indicate that groundwater may flow toward the Passaic River. Bedrock was not encountered during boring activities which extended to 22 feet bgs. Drilling in the immediate vicinity during the Route 21 Geotechnical Investigation identified bedrock at 90 feet bgs.

According to the United States Geological Survey (USGS) Maps of Flood Prone Areas and the National Flood Insurance Rate Maps (National FIRM) published by the U.S. Department of Housing and Urban Development, this site is not located within an area prone to flooding. Also, as indicated in the NJDOT *Ecology Technical Environmental Study* (1987), wetlands are not present within the property boundaries. However, the report indicated that the portion of the Dundee Canal immediately adjacent to the site was considered wetlands.

3.1.4 Description of AECs

3.1.4.1 Previously Identified AECs (Task II)

The Task II investigation focused on three primary AECs: stained soil areas, debris piles and a hydraulic press compactor. Ten soil borings were installed throughout the site to characterize these AECs. Split-spoon samples were collected continuously during the completion of each soil boring from the ground surface to 10 feet bgs to characterize subsurface conditions. Soil samples were collected from depths exhibiting evidence of contamination based on elevated HNu readings or visual observation. If evidence of contamination was not observed, then samples were collected from the split-spoon sample taken either immediately below the ground surface or immediately above the groundwater table. All samples submitted for analysis were analyzed for USEPA priority pollutants plus a forward library search (PP+40) and total petroleum hydrocarbons (TPHs).

The analytical results of the samples collected are provided in Table 3-1. Only those compounds detected are listed in this table. Sample collection depths and comparisons to NJDEP soil cleanup criteria are also provided. Sample locations are provided in Figure 3-1.

Soil samples 01-SB1-010 (1.6 mg/kg), 01-SB1-002 (1.0 mg/kg), 01-SB1-005 (1.7 mg/kg), 01-SB1-006 (1.3 mg/kg), 01-SB1-007 (1.4 mg/kg), and 01-SB1-009 (1.2 mg/kg) had concentrations of beryllium which exceeded or met the NJDEP soil cleanup criterion of 1.0 mg/kg. The soil cleanup criterion for copper of 600 mg/kg was exceeded in samples 01-SB1-006 (770 mg/kg) and 01-SB1-008 (1,360 mg/kg). Samples 01-SB1-005 (1,060 mg/kg) and 01-SB1-006 (606 mg/kg) had concentrations of lead over the soil cleanup criterion of 600 mg/kg. Sample 01-SB1-005 also had a zinc concentration of 2,350 mg/kg, which exceeded the soil cleanup criterion of 1,500 mg/kg.

(Note: Sample designations are as follows: site identification - type of sample [i.e., SB for soil boring, SD for sediment, TP for test pit, SW for surface water] - sample location. For example, 11-SD2-001 indicates Site 11 - sediment sample - location 001. The designations FB and FD following the sample indicate field blank and field duplicate, respectively.)

Concentrations of PCBs exceeded the 2.0-mg/kg residential soil cleanup criterion in samples 01-SB1-001 (4.4 mg/kg) and 01-SB1-006 (7.9 mg/kg). Sample 01-SB1-008 contained 5.0 mg/kg of benzo(a)anthracene and 4.5 mg/kg of benzo(a)pyrene, above their respective cleanup criteria of 4.0 mg/kg and 0.66 mg/kg. Sample 01-SB1-009 also had a concentration of benzo(a)pyrene (2.5 mg/kg) above the soil cleanup criterion of 0.66 mg/kg.

All other compounds detected were present at concentrations below their respective soil cleanup criteria.

3.1.4.2 Additionally Identified AECs

Additional AECs, which were identified during the Task II site inspection but were not specifically addressed during the investigation, included a weigh station, hydraulic press compactor station, and the potential USTs and piping that may be associated with the hydraulic press. In addition, further delineation of soil contamination was considered necessary throughout the site. Both surface and subsurface soil samples contained compounds above the applicable soil cleanup criteria.

Prior to beginning the RI, an overview tour of the site was performed. During the site review it was determined that operations and conditions at the site had changed significantly since the RI. Site Nos. 1 and 3 were both occupied and operated by American Scrap Iron and Metal, Inc. Operations at Site 1 since 1992 had resulted in a significant amount of surficial staining and potential subsurface contamination.

In addition, it was noted that a concrete pad had been constructed between the hydraulic press compactor and weigh station, effectively limiting access to the two AECs. The concrete pad, defining an area of the site used for automobile stripping, was considered a new AEC. Fluids, which had drained from the automobiles during the stripping process, could potentially run off the pad into the surrounding soil. Two sumps were present in the concrete pad. Reportedly, the liquids that accumulate in sump pits are removed and disposed of on a periodic basis.

An additional AEC was also noted north of the hydraulic press compactor, where automobile fluids were stored in containers ranging in size from 5 to 55 gallons. Automobile fluids consist of gasoline diesel fuel, solvents, antifreeze, and spent oil and transmission fluids. During the subsurface investigation individuals were noted to enter the storage oven and siphon fluids into smaller containers for removal from the site. Staining and petroleum odors were evident in the soil surrounding the containers.

Based on the above observations the NJDEP release hotline was contacted. A release was reported for Site Nos. 1 and 3 citing the observation of oily discharges on the ground surface from car parts, tanks and drums. Case No. 95-5-17-1622-47 was assigned to the sites.

3.1.5 Implementation of the Remedial Investigation

The RI sampling activities were initially developed to address the AECs identified during the Task II site inspection, and provide additional information on the vertical and horizontal extent of contamination. Based on changes in the site configuration as well as the observed staining and odors discussed in Section 3.1.4.2, adjustments were made in the sampling strategy.

Ten soil borings were located in the field to address the overall site condition with individual borings biased toward the edge of the concrete pad, the automobile fuel storage area, and other locations where soil staining, odors and site activities were considered suspect.

Soil borings were advanced to a minimum depth of 10 feet bgs, using augers and continuous split spoon sampling. Boring 01-SB2-010 was advanced to a depth of 22 feet in an attempt to locate the groundwater table. Groundwater was not encountered in any of the borings.

Three soil samples were collected from each boring. The samples were collected from the surface, the mid-range, and the bottom of the borings. The mid-range sample was biased toward soils showing evidence of contamination (i.e., elevated PID measurements or visual staining). Since groundwater was not present to define the bottom soil sample, the deep sample was selected using the same criterion as the mid-range sample. If no evidence of contamination was noted, the sample was collected from the bottom of the borehole (approximately 10 feet bgs). In the deep boring, Boring 01-SB2-010, the deep sample was collected from the 9.5- to 10- foot interval.

Samples collected from each interval were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), TAL inorganics, and TPHs. Table 3-2 in Appendix C provides a summary of the analytical results. Only those compounds detected are listed in this table. Depths of samples collected and comparison to soil cleanup criteria are also provided.

3.1.6 Results of the Remedial Investigation

As shown in Table 3-2, 7 of the 10 surface samples exceed the benzo(a)pyrene NRDC soil cleanup criterion. Three samples exceed the NRDC soil cleanup criteria for dibenzo(a,h) anthracene and benzo(b)fluoranthene. In addition to the above compounds samples 01-SB2-009A and 01-SB2-0101A also exceed NRDC soil cleanup criteria for benzo(a)anthracene, benzo(k) fluoranthene and indeno(1,2,3)perylene.

With the exception of samples 01-SB2-006A and 01-SB2-009A, all samples exceeded the NRDC soil cleanup criterion for total PCBs.

The TAL inorganic NRDC soil cleanup criteria for copper, lead, and zinc were exceeded in surface soil samples from all borings except 01-SB2-006 and 01-SB2-008. The NRDC soil cleanup criterion for beryllium was exceeded in surface soil samples from Borings 01-SB2-005 and 01-SB2-006. The surface soil sample from Boring 01-SB2-010 also exceeded the NRDC soil cleanup criterion for cadmium.

The majority of surface soil samples also exceeded the RDC soil cleanup criteria for up to seven SVOCs, total PCBs, and up to eleven TAL inorganics.

Mid-range samples from Borings 01-SB2-005, 01-SB2-008, and 01-SB2-009 also exceeded NRDC soil cleanup criteria for several parameters. Sample 01-SB2-005B exceeded the criterion for beryllium. Boring samples No. 01-SB2-008B, and 01-SB2-009B exceeded the criterion for

benzo(a)pyrene. Sample 01-SB2-009B also exceeded the criterion for dibenzo(a,h)anthracene. Total PCBs were exceeded in sample 01-SB2-008B.

Beryllium was recorded in sample No. 01-SB2-005B (1.1 mg/kg) at a concentration above the RDC soil cleanup criterion of 1.0 mg/kg. In the deep or bottom sample for Boring No. 01-SB2-02, lead (441 mg/kg) was present at a concentration above the RDC soil cleanup criterion of 400 mg/kg.

TPH results for 9 of the 10 surface soil samples exceeded the 10,000 mg/kg total organic contaminant (TORC) cap relative to petroleum hydrocarbons. TPH values ranged from 2,890 mg/kg (sample 01-SB2-06A) to 102,000 mg/kg (sample 01-SB2-03A), with an average concentration of over 40,000 mg/kg. TPH results from the mid-range sample varied from 11.7 mg/kg (01-SB2-05B) to 3,110 mg/kg (01-SB2-08B). TPH levels in the deep samples ranged from below detection levels (BDL) to 121 mg/kg (01-SB2-010C).

All other parameters were either below detection limits for the respective analytical method, or present at concentrations below the NRDC, RDC, and IGW soil cleanup criteria.

3.1.7 Nature and Extent of Contamination

Soils collected from the ground surface (0-0.5 feet) exceed NRDC soil cleanup criteria for SVOCs, total PCBs and TAL inorganics. In addition, nine of the surface soil samples exceed the TORC cleanup criteria of 10,000 mg/kg. Migration of soils in the mid-range sampling depth (3 to 8 feet bgs) did not exceed applicable NJDEP cleanup criteria. Field observations indicated that the affected soils are positioned in the upper 2 to 3 feet of the soil profile.

Soil sampling was restricted to the accessible portions of the subject property. The horizontal extent of contamination is believed to be restricted to within the property boundary defined by steel and concrete walls.

TPH analysis indicates that most of the soil to be remediated will be considered hazardous waste. Additional waste classification sampling should be conducted prior to remediation to determine appropriate waste categories.

Since high levels of contaminants have been identified with some indicative of hazardous waste, remediation of the surficial soils appears warranted. A remedial alternatives analysis followed by the preparation of a Remedial Action Work Plan is recommended.

Since this site is not owned at present by the NJDOT and is active, cleanup should be triggered by the current owner. NJDOT's plans call for the construction of the proposed freeway over the western two-thirds of this site, and the road is reportedly going to be elevated above existing grade. The roadway will be elevated through the importation of fill material. Remediation must occur prior to construction of the freeway.

3.2 SITE 2 - DUNDEE CANAL, BLOCK 54/LOT 1

3.2.1 Property Description

Block 54A, Lot 1 (Site 2) is located in Passaic, New Jersey and is owned by the Dundee Water and Power Company. The lot consists of a portion of the Dundee Canal and a small triangular parcel located at the intersection of Monroe, Dayton, and First Avenues. The small parcel covers approximately 0.1 acre. Areas of environmental concern were not identified within the small parcel. The Dundee Canal portion of this site encompasses approximately 6 acres (3,000 linear feet [LF]). Industrial, commercial and residential properties are located adjacent to the canal. Stormwater runoff from several of these properties discharges to the canal. Steel lines cross immediately above the canal at several points. These lines may be part of the sanitary sewer system in the area. The canal is currently not utilized for any purpose.

This portion of the canal is adjacent to Block 50, Lot 1 (Parkstein Company - Site 3); Block 52, Lot 19 (B.Y. Industries - Site 1); Block 56, Lot 1 (apartments); Block 55, Lot 14/28 (industrial complex); Block 55, Lot 14 A (parking lot); Block 52, Lots 1, 2A, 3A (vacant lots - Site 5); Block 54, Lots 39, 50, 70 (industrial park); and Block 51, Lots 25/25A (vacant lot - Site 8). Household refuse, tires, wood, and miscellaneous debris are present along the entire length of the canal.

3.2.2 Site History

The Dundee Canal was constructed during the late 1800s and was used for industrial transport in conjunction with railroad lines. The southern portion of the canal was filled between 1940 and 1951. The triangular parcel at the intersection of Monroe and Dayton Avenues was formerly part of the canal.

The following chronological history of the site was compiled from the title search and through a review of aerial photographs and Sanborn maps.

- 1894 - Sanborn Map

  Based on the information provided from the 1894 Sanborn map, the entire site was part of the Dundee Canal. To the east of this site was the N.Y.S. & W. Railroad and vacant land. The canal continues to the north and south of the site. The northern section of the site (from the Parkstein Company to the Clifton/Passaic border) was bordered to the east by residential properties and vacant land, and to the west by industrial properties including the Botany Worsted Mills and the Eagle Iron and Brass Factory. Railroad tracks were also located to the west of the canal.

- 1899 - Sanborn Map

The area surrounding the canal remained unchanged from the 1894 Sanborn map. The 1899 Sanborn map identifies rooms labeled "Back Washing Room", "Soap Storage", "Carbonizing Rooms", "Laboratory", and "Dye House" at the Botany Worsted Mills located to the west of the canal. The eastern shore of the canal is not shown in the map.

- 1903 - Sanborn Map

The southern and northern parts of the canal remain unchanged from the 1899 Sanborn map. The adjacent Botany Worsted Mills added a section of building labeled "Sulfur Bleach House" on the bank of the canal. The general area surrounding the site was slightly more developed than in 1899.

- 1910 - Sanborn Map

There were no significant changes within the site or surrounding area from the 1903 Sanborn map.

- 1935 - Sanborn Map

There were no changes within or around the site between 1903 and 1935 with the exception of an additional building located on the northeastern shoreline of the canal labeled as a "Grease Plant" and "Lanolin Plant." This plant was located within Site 8.

- 1940 - Aerial Photograph

Review of the 1940 aerial photograph indicates that an island had formed within the canal directly south of Monroe Street. A building located on the island is labeled as water works. The areas surrounding the canal were residential, commercial and industrial. There was a railroad bordering the eastern bank of the canal. The two junkyards owned by Parkstein Company (Block 50/Lot 1, Block 52/Lot 19) and an industrial facility (Andrew McLean Industrial Complex) are visible to the east of the canal. Directly north of McLean was the grease plant noted in the 1935 Sanborn map. There appears to have been a pipe line crossing the canal from the grease plant to Botany Worsted Mills (located to the west across the canal). North of the McLean Complex on the eastern side of the canal was a large vacant lot. Debris was visible on portions of this lot. There were also approximately 15 containers and 4 other small round tanks located on this vacant lot. This vacant lot is situated within Site 8.

On the southwestern side of the canal is Dayton Avenue, an industrial facility with scattered debris, a small stretch of vacant land and Botany Worsted Mills. There were

large stacks and storage tanks, as well as three water tanks, located at the mills. There were also at least four pipelines or pedestrian bridges crossing the canal.

- 1951 - Sanborn Map

The southern portion of the canal, immediately prior to Dayton Avenue, had been filled in by 1951. This filled area, bordered by First Street, Monroe and Dayton Avenue, was now vacant land. Review of the 1951 Sanborn map indicates no other significant changes to the site or the surrounding area.

- 1951 - Aerial Photograph

Review of the 1951 aerial photograph shows the canal to be filled in at the southern end, which is consistent with the 1951 Sanborn map. The filled portion of the canal was primarily vacant with several parked cars. The rest of the canal remains unchanged from the 1940 aerial photograph, with the exception of minor development of properties surrounding the canal. On the western side of the canal, the small stretch of vacant land (Block 55/Lot 14) had been developed into an industrial facility with one visible stack.

- 1961 - Aerial Photograph

The canal and surrounding area remain unchanged with the exception of Block 51/Lot 25 (Site 8), which is located on the eastern side of the canal. The grease plant present in earlier aerial photographs has been removed. This lot is now vacant; however, debris is present and excavation/earthmoving activities had occurred as evidenced by soil discoloration.

- 1974 - Aerial Photograph

The canal and surrounding properties remain unchanged from the 1961 aerial photograph. Additional excavation/earthmoving has occurred on Site 8 as evidenced by increased areas of soil discoloration. Fill material appears to have been deposited on-site with additional debris.

- 1979 - Sanborn Map

The canal and surrounding properties remain unchanged from the 1951 Sanborn map.

- 1991 - Sanborn Map

Review of the 1991 Sanborn map indicated no significant changes from the 1979 Sanborn map.

3.2.3 Environmental Setting

The Dundee Canal in the area of Block 54A/Lot 1 receives stormwater runoff from numerous commercial, industrial and residential properties located on the eastern and western banks of the canal. Water in the canal flows slowly from south to north; however, the accumulation of garbage and debris in the southern portion of the canal restricts flow and causes stagnant conditions.

Sediment depths beneath the canal were not established during the Task II and Task III investigation. Borings were installed in the Passaic River adjacent to the northern terminus of the canal during the 1992 NJDOT Route 21 Geotechnical Investigation. Borings installed within the Passaic River indicated a sediment thickness of approximately 7 to 9 feet. Bedrock was encountered at approximately 90 feet bgs within borings installed at a site less than one-quarter mile from the canal as part of the Geotechnical Investigation.

An approximately 2-foot-wide band of nonpersistent emergent wetlands occurs along both banks of the canal from its southern terminus to the location where Mattimore Street approaches the western bank of the canal. The total acreage of wetland fringe in this portion of the canal is 0.07 acre.

Depth to groundwater below the canal was not established during the Task II and Task III investigation. Groundwater was encountered in borings adjacent to the canal at a depth of approximately 15 feet bgs. Based on the results of the RI conducted at adjacent Site 8, it was determined that the surface water within the canal is not in direct connection with groundwater.

Although the water in the Dundee Canal has not been assigned a water quality designation by NJDEP, it would most likely be Fresh Water 2 Non-Trout (FW2-NT). Historically, mills along the canal discharged industrial effluent into the canal. Testing performed in 1986 by the NJDOT revealed high levels of ammonia and phosphate. Although levels of turbidity, chlorides, suspended solids, pH, and dissolved oxygen (DO) were within NJDEP standards for FW2-NT waters at the sampling site, the water quality appears poorer due to an abundance of garbage and debris which has been deposited into the canal. The flow here is restricted at times by a "dam" of debris. This results in stagnation creating algal blooms. Consequently, at certain times of the year, DO is expected to be low and BOD is expected to be high.

3.2.4 Description of AECs (Task II)

3.2.4.1 Previously Identified AECs

The primary environmental concern at this site is the potential for contamination within the canal which may have resulted from historical use of the canal for industrial purposes (discharges, transportation) or contamination from nonpoint sources (stormwater runoff). Using a PONAR sampler, two sediment samples were collected during WESTON's Task II Investigation from 0

to 12 inches below the bottom of the canal. Samples were not proposed within the portion of the property at the intersection of Monroe, Dayton, and First Avenues. All sediment samples were analyzed for PP+40 and TPHs and screened using an HNu.

The analytical results of the samples collected are provided in Table 3-4. Only those compounds detected are listed in this table. Sample collection depths and comparisons to the NJDEP sediment quality criteria from the NJDEP "Guidance for Sediment Quality Evaluations" March 1991, are also provided. Sample locations are provided in Figure 3-2.

Analytical results of the two sediment samples collected within the canal identified SVOCs and priority pollutant metals (PPMs,) at concentrations exceeding NJDEP sediment quality criteria. Seven of the SVOCs and all of the PPMs detected in sample 02-SD1-001 exceeded the ER-L criteria (where criteria exist). Additionally, one SVOC and five PPMs exceeded the ER-M criteria for that sample. Sample 02-SD1-002 exhibited concentrations of SVOCs and PPMs that exceeded the ER-M criteria in every instance that criteria exist. In addition, each sediment sample contained 1700 mg/kg of TPHs.

The sediment samples were collected 350 feet apart along the approximate centerline of the canal. Based on these two data points, it is plausible that other portions of the canal (within Block 54A/Lot 1) contain elevated levels of contaminants. The samples collected represent sediment conditions from a depth of 0 to 12 inches below the canal bottom. The vertical extent of the contamination has not been determined. Surface water quality is also a concern based on the results of the sediment sampling and land use in the area.

3.2.4.2 Additionally Identified AECs

This site consists of a large section of the present Dundee Canal and mostly vacant land that the canal once occupied. Major areas of concern center around industrial sites that have existed on or near the bank of the canal, and may have released contamination that migrated into the canal.

The Botany Worsted Mills, a grease and lanolin plant, and the McLean Complex were three major industrial concerns bordering the property. Over the years several of the Botany Worsted Mills buildings were located adjacent to the canal site such as "Back Washing Room", "Soap Storage", "Carbonizing Rooms", "Laboratory", "Dye House", and "Sulfur Bleach House". The grease and lanolin plant was located across the canal from the mill in the early 1900s. Aerial photographs indicate that this plant was removed sometime between 1951 and 1961. The McLean Complex has been occupied by various tenants (businesses) over the years. In addition, historical aerial photographs indicate dumping of soil or debris on property adjacent to the canal (Site 8). From these locations there is a possibility of migration of contaminants into the canal.

3.2.5 Implementation of the Remedial Investigation

To further delineate the vertical extent of contamination and to further characterize the nature of the contaminants present, a total of four borings were completed from 0 to 10 feet below the canal bottom. Boring locations, shown on Figure 3-2, were limited to the 1,400-foot section of the canal that will be impacted by construction. Three soil samples were collected from each boring in accordance with NJDEP's "Guidance for Sediment Quality Evaluation" (March 1991). The samples were collected from the surface (0 to 6 inches below the canal bottom), the mid-range, and the bottom of the borings. The mid-range sample was biased toward soils showing evidence of contamination (i.e., elevated PID measurements or visual staining). When no signs of contamination were observed, the samples were collected from 5 to 5.5 feet below the canal bottom. The bottom sample was collected from 9.5 to 10 feet below the canal bottom.

Sediment samples were analyzed for base/neutral/acid extractables with a forward library search (BNA+20), TAL inorganics, total organic carbon (TOC), pH, dioxin/furan and particle grain size.

One composite sample was collected from each boring, by combining equal portions of the surface, mid-range and bottom samples. The composite samples were analyzed for disposal characteristics, including full Toxicity Characteristics Leachate Procedure (TCLP) parameters, reactivity and PCBs in order to identify disposal and/or treatment options prior to excavation.

One surface water sample was collected from this portion of the canal. The sample was analyzed for TCL+30, TAL inorganics, total coliform, fecal coliform, total suspended solids (TSS), total dissolved solids (TDS), and oil and grease.

3.2.6 Results of the Remedial Investigation

The analytical results for the Site 2 sediment samples indicated that concentrations of 11 SVOCs exceeded both the ER-L and ER-M criteria. Approximately 7 percent of the soils exceeding the sediment quality guidelines exceeded the ER-L criteria only. The 11 compounds represent all of the SVOCs identified in the NJDEP "Guidance for Sediment Quality Evaluations." The remaining SVOC compounds identified in the analyses were either detected, but no sediment quality criteria were available, or were below the detection limits for the analytical methods used. All 22 TAL inorganics were detected in most of the sediment samples collected. However, antimony, cadmium, chromium, copper, lead, mercury, nickel, and zinc were detected in the majority of the samples at concentrations exceeding both the ER-L and ER-M criteria. With the exception of arsenic, all TAL inorganic compounds identified in the NJDEP, "Guidance for Sediment Quality Evaluation," were present above sediment quality criteria. TOC ranged from 17,300 mg/kg to 202,000 mg/kg, and pH varied between 6.7 and 7.3. Table 3-4 in Appendix C presents a summary of the analytical results for sediment samples.

Seventeen dioxins were detected in one or more of the samples. Concentrations range up to 41,960 parts per trillion (ppt). No cleanup criteria are currently in effect for dioxins.

Particle grain size analysis generally indicates that the sediment samples vary heterogeneously in both the horizontal and vertical directions. The surface sample at location 02-SD2-001 consists of clay and silt with a minor sand fraction. The mid-range and bottom samples are predominantly sand with some clay and silt. Analysis of the samples collected from location 02-SD2-002 indicates the opposite, with the surface sample consisting mainly of sand, and deeper samples becoming predominantly silt and clay mixtures. Samples from location 02-SD2-003 are similar to the 02-SD2-002 soil column. Location 02-SD2-004 has a surface sample that is approximately half silt and clay and half sand. Deeper samples at location 02-SD2-004 are predominantly sand with only trace amounts (approximately 10 percent by weight) of silt and/or clay. Particle size analysis documentation is presented in Appendix D.

Waste classification (TCLP) analysis performed on the sediment samples indicates that all parameters analyzed were below the criteria classifying the sediments as hazardous waste. Sediment samples were also determined to be nonreactive. Results of the waste classification analyses for SVOCs, VOCs, Pesticides/Herbicides, PCBs and Metals are presented in Table 3-5, in Appendix C.

The surface water sample obtained at Site 2 was analyzed for VOCs, SVOCs, Metals, oil and grease, total coliform, fecal coliform, TDS, TSS and pH. With the exception of two metal analytes (lead and aluminum) all parameters were present either at levels below the NJDEP FW2-NT surface water standards or below method detection limits. Lead (17.8 ug/L) and aluminum (230 ug/L) were above FW2-NT surface water standards of 5 ug/L and 200 ug/L, respectively. Results of the surface water analytical testing are summarized on Table 3-6 in Appendix C.

3.2.7 Nature and Extent of Contamination

Based on the laboratory analysis, sediment to a depth greater than 10 feet below the bottom of the canal exceeds the NJDEP Sediment Quality Guidance Criteria for TAL metals and SVOCs. Contaminant concentrations do not vary consistently with depth or in the upstream/downstream direction. Peak concentrations occur in surface, mid-range and bottom samples.

Construction of the roadway may require construction personnel to come in direct contact with the contaminated sediments. In order to avoid exposure, remediation of the sediments may be conducted prior to construction. If remediation is not required, construction personnel should be health-and-safety-trained and provided with adequate protective equipment and clothing.

Construction of retaining walls, abutments, or piers, or filling of the canal may require the removal of sediment and water. Construction design is currently under way. Dewatering may be required prior to removal of the sediment. Sediment removed from the canal is not

considered hazardous waste, based on the waste classification analysis performed during the RI. Additional waste classification analysis will be required during the removal activities.

3.3 SITE 3 - PARKSTEIN COMPANY, BLOCK 50/LOT 1

3.3.1 Property Description

Block 50, Lot 1 (Site 3) is an active scrap yard located at 201 Market Street in Passaic, New Jersey (Figure 3-3). The site, owned by Parkstein Company, was formerly leased to Continental Roofing, a company engaged in roofing installation and repair. The site is currently occupied by American Scrap Iron and Metal, Inc. The SIC code for the site, based on its scrap yard operations, is #5093, designated as an establishment primarily engaged in assembling, breaking, sorting and wholesale distribution of scrap and waste materials. The property is approximately 1 acre in size. A building containing approximately 8,500 square feet of floor space occupies the southern portion of the site. The property is enclosed by a concrete and sheet metal wall.

The site is bordered to the west by abandoned railroad tracks (Site 6) and the Dundee Canal (Site 2). B.Y. Industries (Site 1) abuts the property to the north. Residential properties are located to the east and south of the site.

Three drum storage areas containing 5 to 20 drums each were noted on-site during the Task II investigation. In addition, one tank truck was present in the northwestern portion of the site. An additional tank truck was noted during a field survey prior to the Task II investigation.

The presence of fill ports and conversations with the tenant indicated that two fuel oil USTs may also be present. One may be located along the eastern boundary of the property, beneath the sidewalk, and one may be located immediately adjacent to the building.

3.3.2 Site History

The following section details the history of the site and surrounding properties. This information was obtained from a title search and a review of historical aerial photographs and Sanborn maps.

Prior to 1945 a portion of the site was occupied by the Eagle Iron and Brass Foundry. The site operated as a scrap metal/junkyard from approximately 1945 to the mid-1980s. Title searches disclosed the following ownership history:

- Iron Eagle and Brass Foundry and William P. Latham and Sons, Co. owned the property from 1920 to 1943, and sold it to Samuel Hunter in 1943.
- Samuel Hunter sold the property to Jerome H. Stein in 1975.
- Jerome H. Stein sold the property to B.Y. Industries in 1981.

- B.Y. Industries sold the property to Parkstein in 1986.

The following is a chronological history compiled from a review of aerial photographs and Sanborn maps.

- 1894 - Sanborn Map

Based on the information provided in the 1894 Sanborn map, the property consisted of vacant land, a house, and the Eagle Foundry. The lot was bordered by the railroad (and Dundee Canal beyond that) to the west and north, Second Avenue to the east and vacant land to the south. Across Second Avenue was the DeVries Brothers Machine Shop.

- 1899 - Sanborn Map

The 1899 Sanborn map of this area indicates that the foundry had expanded its operations on the lot. The surrounding area was somewhat more developed than in 1894.

- 1903 - Sanborn Map

Review of the 1903 Sanborn map shows that the Eagle Iron and Brass Foundry now operated on 90 percent of the lot. A small building was present on the other 10 percent of the site. The foundry had a "Coke Shed" by the railroad tracks.

- 1910 - Sanborn Map

The 1910 Sanborn map indicates that the foundry had expanded its buildings again. A larger coal and coke shed was now present on site. The area surrounding the site was more developed in 1910 than in 1903. A. Wilensky & Sons operated a Scrap Iron & Metals & Ice Company bordering the southern edge of the site and M. Diamond Cigar Factory was located to the east, just north of DeVries Bros. Machine Shop.

- 1935 - Sanborn Map

According to the 1935 Sanborn map, the lot was completely covered by the Eagle Iron and Brass Foundry. The map also indicated that the facility was not in operation and that the buildings were in poor condition. The adjacent properties contained residential apartments, commercial businesses, and vacant land.

- 1940 - Aerial Photograph

The review of the 1940 aerial photograph indicates no significant changes at the site or the surrounding area from the 1935 Sanborn map.

- 1951 - Sanborn Map

Based on the information provided from the 1951 Sanborn map, the lot was a junkyard. A majority of the buildings had been removed. A private garage was on the southeastern portion of the site and a scrap metal storage building was located on the northeastern part. The canal had been filled in southwest of the site.

- 1951 - Aerial Photograph

A review of the 1951 aerial photograph confirms the findings of the 1951 Sanborn map review.

- 1961 - Aerial Photograph

The 1961 aerial photograph review indicated no significant changes at the site. Block 52/ Lot 19 (Site 1) located to the northeast of the site and also owned by Parkstein Company (in 1992) was a junkyard as well. The review indicated no other significant changes to the surrounding area.

- 1974 - Aerial Photograph

The 1974 aerial photograph shows one additional building on the southern area of the property. Other site features remain the same as in the 1961 aerial photograph review, with about half the site being used as a junkyard.

- 1979 - Sanborn Map

The 1979 Sanborn map indicates that the scrap storage building had been demolished and that most of the site is still a junkyard. There have been no significant changes in the surrounding area.

- 1991 - Sanborn Map

The building on the southern portion of the site had been expanded by approximately two-thirds its 1979 size.

3.3.3 Environmental Setting

The majority of the site is covered by a worn asphalt layer that has been cracked in several locations. The Dundee Canal is located immediately northwest of the site. Although site topography is essentially flat, most of the surface water runoff generated during storm events appears to flow toward the canal via overland flow.

Overburden encountered during soil boring activities conducted during the Task II and RI investigations was comprised of primarily fill material consisting of silt, sand, and gravel. The fill encountered within the borings was frequently stained. Brick fragments were often encountered within the fill material. Groundwater was encountered at approximately 7 to 10 feet bgs. Groundwater flow direction is unknown at present; however, general topographic features indicate that groundwater may flow toward the Passaic River. Bedrock was not encountered during boring activities which extended to 10 feet bgs. Drilling performed in the general vicinity during NJDOT's geotechnical investigation identified bedrock at 90 feet bgs.

According to the Maps of Flood Prone Areas and the National FIRM published by the U.S. Department of Housing and Urban Development, this site is not located within an area prone to flooding. Also, as indicated in the NJDOT *Ecology Technical Environmental Study* (1987), wetlands are not present within the property boundaries. However, the report indicated that the portion of the Dundee Canal immediately adjacent to the site was considered wetlands.

3.3.4 Description of AECs

3.3.4.1 Previously Identified AECs (Task II)

The Task II investigation focused on three primary areas of environmental concern: stained soil areas, three drum storage areas, and a tanker storage area. Five soil borings were installed throughout the site to identify contamination within these AECs. Split-spoon samples were collected continuously during the completion of each soil boring from 1 to 10 feet bgs to characterize subsurface conditions. One soil sample was collected from the depth exhibiting evidence of contamination based on elevated readings on the HNu or visual observation. If evidence of contamination was not observed, then samples were collected from the split-spoon sample taken either immediately below the ground surface or immediately above the groundwater table. One surface soil sample and four subsurface soil samples were collected. All samples submitted for analysis were analyzed for PP+40 and TPHs.

The analytical results of the samples collected are provided in Table 3-7. Only those compounds detected are listed in this table. Sample collection depths and comparisons to NJDEP soil cleanup criteria are also provided. Sample locations are provided in Figure 3-3.

Six SVOCs (carcinogenic polynuclear aromatic hydrocarbons [CaPAH]), beryllium (5.5 mg/kg), copper (952 mg/kg), and lead (4,510 mg/kg) were detected at concentrations above their respective soil cleanup criteria in soil sample 03-SB1-003. In addition, the total organics concentration in sample 03-SB1-003 (17,235 mg/kg) exceeded the soil cleanup criteria of 10,000 mg/kg. The sample exceeded the criteria mainly due to a reported TPH concentration of 17,000 mg/kg. VOCs and SVOCs were detected in the other four soil samples at concentrations below the soil cleanup criteria. Beryllium was detected in samples 03-SB1-004 (1.1 mg/kg), 03-SB1-005 (1.6 mg/kg), and 03-SB1-005D (1.8 mg/kg) at concentrations above the soil cleanup criteria of 1.0 mg/kg.

3.3.4.2 Additionally Identified AECs

One major concern at this site is related to historical operations on-site. Sanborn maps and aerial photographs indicate that the site was occupied by an Iron and Brass Foundry in the early 1900s and later by a junkyard. The site operated as a foundry from at least 1894 until 1951 by which time it had become a scrap metal junkyard. These historical site operations may have led to possible metals contamination in the soil.

The RI Work Plan for Site 3 identified three AECs for further investigation based on the Task II site investigation. The first area consisted of delineating the soils surrounding boring 03-SB1-003. The remaining two AECs were suspected USTs.

Prior to beginning the RI, an overview tour of the site was performed. During the site review it was determined that operations and conditions at the site had changed significantly since the Task II investigation. Site Nos. 1 and 3 were both occupied and operated by American Scrap Iron and Metal, Inc. Operations at Site 3 since 1992 had resulted in a significant amount of surficial soil staining and potential subsurface contamination.

3.3.5 Implementation of the Remedial Investigation

Based on the observations made during the preliminary site inspection, the Work Plan for Site 3 was revised to include the installation of 10 borings distributed throughout the site and biased toward areas of soil staining. The Work Plan revisions were submitted to NJDEP in a letter dated 18 May 1995.

Soil borings were advanced to a minimum depth of 10 feet bgs, using augers and continuous split spoon sampling. Three soil samples were collected from each boring. The samples were collected from the surface, the mid-range and bottom of the borings. The mid-range sample was biased toward soils showing evidence of contamination (i.e., elevated PID measurements or visual staining). Since groundwater was not present to define the bottom soil sample, the deep sample was selected using the same criteria as the mid-range sample. If no evidence of contamination was noted, the deep soil sample was collected from 9.5 to 10.0 feet bgs.

Samples collected from each interval were analyzed for TCL VOCs, SVOCs, PCBs, TAL inorganics and TPHs. Table 3-8 in Appendix C provides a summary of the analytical results. Only compounds detected are listed in this table. Sample collection depths and comparisons to soil cleanup criteria are also provided.

Geophysical surveys using ground penetrating radar (GPR) and magnetometer equipment was planned for the two suspected UST locations. One location, located inside the property, could not be investigated due to automobile parts piled over the AEC. The autoparts could not be relocated according to the facility operators. GPR and magnetometer surveys were conducted in the remaining, suspected UST location.

3.3.6 Results of the Remedial Investigation

As shown in Table 3-8, 9 out of 10 surface soil samples exceeded NRDC soil cleanup criteria for one or more of the following SVOCs: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k) fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene. Two deeper samples, 03-SB2-008B (7.5' to 8.0') and 03-SB2-008C (9.5' to 10.0'), exceeded the NRDC soil cleanup criteria for benzo(a)pyrene.

Two surface soil samples, 03-SB2-003A and 03-SB2-009A, exceeded the NRDC soil cleanup criteria for total PCBs.

The TAL inorganic NRDC soil cleanup criteria for copper, lead, and thallium were exceeded in surface soil samples from a majority of the borings performed. The beryllium NRDC soil cleanup criterion was exceeded in surface soil samples from Borings 03-SB2-005, 03-SB2-006, 03-SB2-008, and 03-SB2-009. The surface soil samples from Boring Nos. 03-SB2-007 and 03-SB2-009 also exceeded the zinc NRDC soil cleanup criterion. Two mid-range samples 03-SB2-004B (3.5' to 4.0') and 03-SB2-010B (5.5' to 6.0') exceeded the NRDC soil cleanup criterion for thallium.

The majority of surface soil samples also exceeded the RDC soil cleanup criteria for up to seven SVOCs, total PCBs and nine TAL inorganics.

TPH results for 7 of the 10 surface soil samples exceeded the 10,000 mg/kg TORC cap relative to petroleum hydrocarbons. TPH values ranged from 2,460 mg/kg (03-SB2-07A) to 115,000 mg/kg (03-SB2-06A), with an average concentration of over 21,000 mg/kg. TPH results from the mid-range samples varied from BDL (03-SB2-01B) to 3,490 mg/kg (03-SB2-03B). TPH levels in the deep samples ranged from 5.2 mg/kg (03-SB2-04C) to 467 mg/kg (03-SB2-03C).

All other parameters were either below detection limits for the respective analytical method or present at concentrations below the NRDC, RDC and IGW, soil cleanup criteria.

GPR and magnetometer investigations on the sidewalk northeast of Site 3 indicate the presence of buried ferrous material within the suspected UST location. Figure 3-4 provides a plan view of the survey area. The geophysical investigation method summary is provided in Appendix A.

3.3.7 Nature and Extent of Contamination

Soils collected from the ground surface (0-0.5 feet) exceed NRDC soil cleanup criteria for SVOCs, total PCBs and TAL inorganics. In addition, 7 of the surface soil samples exceed the TORC cleanup criteria of 10,000 mg/kg. The majority of soils in the mid-range sampling depth (3.5 to 8 feet bgs) did not exceed NJDEP cleanup criteria requiring remediation. Field observations indicate that the affected soils are positioned in the upper 2 to 3 feet of the soil profile.

Soil sampling was restricted to the accessible portions of the subject property. The horizontal extent of contamination is believed to be restricted to within the property boundary defined by steel and concrete walls.

Based on TPHs analysis, most of the soil at Site 3 will fall below the level defining hazardous waste. TCLP analysis, however, was not performed on soil samples collected from Site 3. Site 3 soils in the hazardous waste category should be combined with the Site 1 materials for disposal. Additional waste classification sampling and analysis will be required to determine appropriate waste categories at the time of the disposal.

Results of the geophysical survey, while not conclusive, indicate the potential presence of a UST. Future remedial activities should include an intrusive investigation to confirm the UST status. Closure of the tank would be required if a UST was uncovered.

Since this site is not owned at present by the NJDOT and is active, cleanup should be triggered by the current owner. NJDOT's plans call for the construction of the proposed freeway over the western two-thirds of this site, and the road is reportedly going to be elevated above existing grades. The roadway will be elevated through the importation of fill material. Remediation must occur prior to construction of the freeway.

3.4 SITE 5 - NJDOT VACANT LOTS, BLOCK 52/LOTS 1, 2A, 3A

3.4.1 Property Description

Block 52, Lots 1, 2A, and 3A (Site 5) are located between Third Street and the Dundee Canal in Passaic, New Jersey (Figure 3-4). The property is owned by the NJDOT. The lots encompass approximately 0.3 acre. Lots 2A and 3A are located behind residential homes and appear to be utilized for backyards. These lots are encompassed by a fence which surrounds the residential properties.

Lot 1 is enclosed by a 4-foot-high chain-link fence with an entrance gate opening to Third Street. This fence had been installed by NJDOT to minimize haphazard dumping. A small paved area, stained in sections, is present in the center of this lot. Several stained, unpaved soil areas and miscellaneous debris such as tires, concrete, old appliances, and household refuse were noted within Lot 1 during the Task II investigation.

The site is situated in a mixed residential and industrial community. All three lots are bordered to the west by abandoned railroad tracks (Site 6) and the Dundee Canal (Site 2). The Andrew McLean Complex (Site 7) is located to the east of the property on the opposite side of Third Street. B.Y. Industries (Site 1) abuts the site to the south.

Several mounded areas of fill material are present on the Conrail property (Site 6), along the western border of the three lots.

3.4.2 Site History

The following section details the history of the site and surrounding properties. This information was obtained from a title search and a review of historical and aerial photographs and Sanborn maps. The property (Site 5) is comprised of four parcels. Title searches disclosed the following ownership history:

Parcel 26

- Mendel Presberger and Julia (his wife) and Moses D. Preiskel and Nina (his wife) sold the property to Aaron White on 26 October 1899.
- Aaron White and Jane N. (his wife) sold the property to Leonard White on 20 June 1911.
- Leonard White sold the property to Jane N. White on 20 June 1911.
- Jane N. White and Aaron (her husband) sold the property to Leonard White on 22 May 1913.
- Leonard White sold the property to Aaron White on 22 May 1913.
- Aaron White and Jane (his wife) sold the property to Joseph Linamon and Anna (his wife) on 1 August 1918.
- Julius Linamon and Frances (his wife) and Molly Linamon sold the property to Lucille Morba on 11 February 1964.

- Lucille Morba and Edward (her husband) sold the property to Joseph Raimo, Inc. on 25 August 1964.

- Joseph Raimo, Inc. sold the property to NJDOT on 17 February 1972.

Parcel 28

- Mendel Presberger and Julia (his wife) and Moses Preiskel and Nina (his wife) sold the property to Simon Glasel and Fannie (his wife) on 14 February 1900.

- Fannie Glasel sold the property to Joseph Marton on 1 March 1921.

- Joseph Marton and Elizabeth (his wife) sold the property to Irene Ninters on 28 August 1936.

- Irene Ninters and Mat (her husband) sold the property to Joseph Marton Jr. on 3 June 1937.

- Joseph Marton Jr. and Mary (his wife) sold the property to Alexander Marton on 28 March 1940.

- Alexander Marton and Helen (his wife) sold the property to Emily Shulting on 1 August 1946.

- Emily Shulting sold the property to Ruth D. Marton on 1 April 1949.

- Ruth D. Marton and Louis (her husband) sold the property to Anna Pivovarnik on 15 February 1955.

- Anna Pivovarnik and Andrew (her husband) sold the property to NJDOT on 27 July 1972.

Parcel 29

- Emily Shulting sold the property to Ruth Marton on 1 April 1949.

- Louis Marton Jr. and Ruth (his wife) sold the property to Edward Bandarek and Mary (his wife) on 2 September 1958.

- Edward Bandarek and Mary (his wife) sold the property to NJDOT on 1 June 1972.

Parcel 16A

- NJDOT has not taken possession of this parcel. Therefore, a deed search was not available.

The following chronological history of the site was compiled from the title search and through a review of aerial photographs and Sanborn maps.

- 1899 - Sanborn Map

Based on the information provided from the 1899 Sanborn map, this site was vacant land in 1899. To the northeast of the site was the Andrew McLean Industrial Complex. To the west were railroad tracks and beyond that was the canal. The remainder of the site was bordered by vacant land.

- 1903 - Sanborn Map

The 1903 Sanborn map shows no significant changes at the site except for the presence of a small shed on Lot 1. Tenements built to the east and south of the site were the only significant changes to the surrounding area.

- 1910 - Sanborn Map

Based on the information provided from the 1910 Sanborn map, Lots 2A and 3A were still vacant, although they appear to have been the "backyards" of two buildings. Lot 1 was now occupied by a business designated as A. White, Coal Wood and Ice. This lot had a coal shed along its northwestern edge.

- 1940 - Aerial Photograph

The 1940 aerial photograph of the site still shows lots 2A and 3A as vacant "backyards" for two buildings. Two buildings were present on Lot 1 with a fence along the western and southern borders. The area surrounding the site was commercial, residential, and to the northeast, industrial.

- 1951 - Sanborn Map

The 1951 Sanborn map indicates no changes to the site since the 1910 Sanborn map. There was a junkyard bordering the western edge of lots 2A and 3A which was not present in earlier Sanborn maps. In general, the surrounding area was now more developed than in 1910, both residentially and commercially.

- 1951 - Aerial Photograph

Review of this 1951 aerial photograph confirms the findings of the 1951 Sanborn map review.

- 1961 - Aerial Photograph

Review of the 1961 aerial photograph reveals no significant changes to the surrounding area or to lots 2A and 3A. Lot 1 contained debris and appears to be a junkyard.

- 1974 - Aerial Photograph

Lot 1 had been cleared of the debris and the buildings previously on the lot were removed. The remainder of the site and surrounding area had not significantly changed since 1961.

- 1991 - Sanborn Map

Review of the 1991 Sanborn map indicates no significant changes to the site or surrounding area from the 1974 Sanborn map.

3.4.3 Environmental Setting

Most of the site is unpaved; however, a small paved area is present in the center of the lots. The Dundee Canal is located immediately west of the site. Most of the surface water runoff generated during storm events appears to flow toward and enter the canal through a natural drainway extending from Lot 1 to the canal.

Soil boring activities were not conducted at the site; however, three test pits were excavated along the eastern border of the Conrail site (Site 6). Soil horizons within these test pits were comprised of fill material consisting of silt, sand, and gravel. Black oxidized slag material was also noted within the soil horizons. Groundwater depth information was not obtained for this site during the Task II investigation. Groundwater was encountered 8 feet bgs at Site 1. Groundwater flow direction is unknown at present. Depth to bedrock on site is unknown, but borings installed in 1992 within one-eighth of a mile of the site encountered bedrock at approximately 90 feet bgs.

According to the USGS Maps of Flood Prone Areas and the National FIRM published by the U.S. Department of Housing and Urban Development, this site is not located within an area prone to flooding. Also, as indicated in the NJDOT *Ecology Technical Environmental Study* (1987), wetlands are not present within the property boundaries. However, the report indicated that a small portion of the Dundee Canal immediately adjacent to the site was considered wetlands.

3.4.4 Description of AECs

3.4.4.1 Previously Identified AECs

Numerous surface stained areas were observed within Lot 1. The stains are assumed to be the result of leakage from automobiles periodically parked within the vacant lot. SVOCs were detected at concentrations above the NJDEP soil cleanup criteria in three samples collected from stained areas at the Conrail site (Site 6), which is immediately adjacent to Site 5. Therefore, elevated SVOC concentrations are anticipated within stained areas at Site 5.

3.4.4.2 Additionally Identified AECs (Task II)

Sanborn maps and aerial photographs indicate that Lot 1 was occupied in 1910 by a company that sold coal, wood and ice. Coal storage may have impacted soil quality if the coal was stored directly on unpaved soil. Additionally, the 1961 aerial photograph revealed that Lot 1 may have been used as a junkyard.

3.4.5 Implementation of the Remedial Investigation

As stated in the Work Plan, an inspection was conducted at Site 5 due to the presence of SVOCs at concentrations above NJDEP soil cleanup criteria at Site 6 (immediately adjacent). Inspections conducted on 15 and 16 May 1995 failed to identify areas of soil staining or other environmental concerns. No samples were collected at the site. The site is depicted in Figure 3-5 in Appendix B.

3.4.6Results of the Remedial Investigation

Based on the results of the inspection and the fact that NJDOT will be placing fill on top of Site 5 to construct the freeway, NJDOT requested no further investigation or remedial action at the site. No further action was requested in the "Addendum to the Approved Work Plan" letter, dated 18 May 1995.

3.5 SITE 6 - CONRAIL RAILROAD, BLOCK 50/LOT 2

3.5.1 Property Description

Block 50, Lot 2 (Site 6) is comprised of a Conrail-owned abandoned railroad spur which extends from First Avenue to the end of the Andrew McLean Industrial Complex, in Passaic, New Jersey. Conrail recently acquired the property from the Erie-Lackawanna Railroad Company.

The site is situated in a mixed residential and industrial community. The railroad spur extends along the eastern bank of the Dundee Canal for approximately 1,200 feet. The site borders the following properties included in the Route 21 investigation: Parkstein Company (Site 3), B.Y. Industries (Site 1), NJDOT vacant lots (Site 5) and the Andrew McLean Industrial Complex (Site 7). Several mounded areas of fill material were noted along the abandoned tracks during the Task II investigation. Several areas of stained soil were also observed. These areas were previously thought to be located on Block 52, Lots 1, 2A, and 3A; however, a subsequent survey of the sampling points confirmed their location within Site 6.

3.5.2 Site History

The following section details the history of the site and surrounding properties. This information was obtained from a review of historical aerial photographs and Sanborn maps.

The site operated as an active rail line prior to 1894 until approximately 1974. Several railroads have owned the property including the New York, Susquehanna and Western Railroad; the Erie Railroad; and most recently Conrail. The following chronological history of the site was compiled from the review of aerial photographs and Sanborn maps.

- 1894 - Sanborn Map

  Based on the information provided by the 1894 Sanborn map, the lot was used by the New York, Susquehanna and Western Railroad. Railroad tracks were present.

  The site was bounded to the west by the Dundee Canal and to the east by primarily vacant land. The Eagle Foundry was adjacent to the site.

- 1899 - Sanborn Map

  The 1899 Sanborn map shows no significant changes to the site since 1894. The Andrew McLean Industrial Complex had been constructed adjacent to the railroad site. The remaining area surrounding the site was unchanged from 1894.

- 1903 - Sanborn Map

  The Eagle Foundry, which bordered the site, had expanded its operations. No other major changes to the site or surrounding area were noted.

- 1910 - Sanborn Map

  There were additional railroad spurs added to the property since 1903. No other significant changes were made to the site.

The surrounding area had been developed, with a scrap metal business, a coal business and the expanded foundry adjacent to the site.

- 1935 - Sanborn Map

The 1935 Sanborn map indicates that the railroad had changed ownership. The railroad was retitled as the Erie Railroad (New York Division). There had been no other changes to the site.

The scrap metal junkyard and the foundry adjacent to the site were no longer in operation. The Andrew McLean Industrial Complex remained to the southeast of the site and manufactured finished cotton goods.

- 1940 - Aerial Photograph

Review of this 1940 aerial photograph confirms that this site contained railroad tracks. The western side of the lot was bordered by the canal. The eastern side of the lot now bordered two junkyards, commercial properties and a large industrial facility (McLean Complex).

- 1951 - Sanborn Map

Review of the 1951 Sanborn map does not indicate any changes to the site since the 1940 aerial photograph.

- 1951 - Aerial Photograph

The 1951 aerial photograph does not indicate any significant changes to the site or surrounding area since the 1940 aerial review, with the exception of the southern canal, which had been filled in.

- 1961 - Aerial Photograph

There appears to have been disturbed soil (or debris) on the north end of the site. The 1961 aerial photograph does not indicate any other significant changes to the site or surrounding area from the 1951 aerial photograph.

- 1974 - Aerial Photograph

The tracks do not appear to have been in use. The railroad bridge over the Passaic is no longer present. There was a small amount of debris present at the southern end of the site and some disturbed soil was evident on-site adjacent to Block 52/Lot 1. The surrounding land use had remained unchanged from 1961.

- 1979 - Sanborn Map

The 1979 Sanborn map does not indicate any significant changes since 1974.

- 1991 - Sanborn Map

The 1991 Sanborn map does not indicate any significant changes since 1974.

3.5.3 Environmental Setting

WESTON and NJDOT representatives conducted a site inspection of the property in 1991. During the inspection, vegetation and soil covered a large portion of the tracks. Several mounded areas of fill material were noted along the abandoned tracks. Several areas of stained soil were also observed. These areas were previously thought to be located on Site 5; however, during the Task II investigation it was determined that these areas were actually within Site 6. Surface water runoff generated during storm events flows west into the canal, primarily through a drainway located adjacent to Site 5.

Test pits were excavated within fill mounds to 5 feet bgs. Overburden encountered within the test pits was comprised of fill material consisting of silt, sand, and gravel. Staining and oxidized metal slag material was also present in the fill material. Overburden encountered within soil borings installed adjacent to the Andrew McLean Industrial Complex (Site 7) was comprised of primarily natural materials consisting of sands and silts. Groundwater flow direction at the site is unknown at present; however, general topographic features indicate that groundwater may flow toward the Passaic River. Bedrock was not encountered during boring activities which extended to 10 feet bgs; however, bedrock was encountered at approximately 90 feet bgs during the 1992 Route 21 Geotechnical Investigation at a site within one-eighth of a mile from Site 6.

According to the USGS Maps of Flood Prone Areas and the National FIRM published by the U.S. Department of Housing and Urban Development, this site is not located within an area prone to flooding. Also, as indicated in the NJDOT *Ecology Technical Environmental Study* (1987), wetlands are not present within the property boundaries. However, the report indicated that a small portion of the Dundee Canal adjacent to the site from its southern end to Mattimore Street was considered wetlands.

3.5.4 Description of AECs

3.5.4.1 Previously Identified AECs (Task II)

The Task II investigation focused on three primary areas of environmental concern: stained soils, fill mounds, and historical site usage. A total of nine soil samples were collected to determine whether soil conditions have been impacted. Three surface soil samples were collected from 0 to 24 inches bgs at locations where stained soil was evident. Three test pits were excavated to

approximately 4 to 5 feet bgs to characterize the fill material. Three soil borings were installed along the railroad tracks to determine whether historical activities had impacted soil conditions. Split-spoon samples were collected continuously during the completion of each soil boring from 0 to 10 feet bgs. One soil sample was collected from the depth exhibiting evidence of contamination based on elevated readings on the HNu or visual observation. If evidence of contamination was not observed, then samples were collected from split-spoon samples taken either immediately below the ground surface or immediately above the groundwater table. Surface soil samples were analyzed for base neutrals plus a forward library search (BN+15) and TPHs. All other samples were analyzed for PP+40 and TPHs.

The analytical results of the samples collected are provided in Table 3-9. Only those compounds detected are listed in this table. Sample collection depths and comparison to the NJDEP soil cleanup criteria are also provided. Sample locations are provided in Figure 3-6.

SVOCs were detected in the every soil sample collected. Benzo(a)pyrene was detected in samples 05-SS1-001 (1.3 mg/kg), 05-SS1-002 (1.3 mg/kg), 05-SS1-003 (1.2 mg/kg), and 05-TP1-002 (1.4 mg/kg) at concentrations exceeding the NJDEP soil cleanup criterion of 0.66 mg/kg. The 10,000 mg/kg soil cleanup criterion for total organics was exceeded in sample 05-SS1-001 (14,015 mg/kg), primarily due to the presence of TPHs at a reported concentration of 14,000 mg/kg. Arsenic (22.4 mg/kg), lead (2,320 mg/kg), and zinc (2,590 mg/kg) were detected in test pit sample 05-TP1-002 at concentrations exceeding their respective cleanup criteria of 20 mg/kg, 600 mg/kg, and 1,500 mg/kg.

3.5.4.2 Additionally Identified AECs

Additional AECs were not observed during the Task II sampling effort or during subsequent analysis of the Sanborn maps and aerial photographs.

3.5.5 Implementation of the Remedial Investigation

As stated in the Work Plan, an inspection was conducted at Site 6 due to the presence of SVOCs at concentrations above NJDEP Soil Cleanup Criteria. Inspections conducted on 15 and 16 May 1995 failed to identify the presence of new mounds or stained areas. No samples were collected at the site.

3.5.6 Results of the Remedial Investigation

Based on the results of the inspection and the fact that NJDOT will be placing fill on top of Site 6 to construct the freeway, NJDOT requested no further investigative or remedial action at the site. In previous communication with NJDEP, NJDOT has recommended implementation of a DER for Site 6.

3.6 SITE 7 - CHELTON REALTY COMPANY/MC LEAN INDUSTRIAL COMPLEX, BLOCK 7/LOTS 1, 51, 52, 53, 59

3.6.1 Property Description

Block 7, Lot 1 (Site 7) is an active industrial and commercial complex located at 250 Fourth Street in Passaic, New Jersey. The property is owned by Chelton Realty Company and encompasses approximately 5 acres, nearly all of which is occupied by building space. The complex contains numerous industrial and commercial tenants. The original structure was built in the late 1800s, and most of the site is currently occupied. The site is bordered to the west by the Dundee Canal and to the east by the Passaic River.

Present roadway construction plans would impact the westernmost portion of the site. This area consists of primarily open area including an access road. The two-story building present on the property will not be impacted.

The Heritage Steel and Splitting Company (a tenant on site) underwent an Environmental Cleanup Responsibility Act (ECRA) investigation in the late 1980s. AECs were not identified on site and a negative declaration was issued by the NJDEP. Present roadway construction plans do not impact this portion of the site.

3.6.2 Site History

The following section details the history of the site and surrounding properties. This information was obtained from a title search and a review of historical aerial photographs and Sanborn maps.

Title searches disclosed the following ownership history:

- Andrew McLean Company purchased Blocks 6 and 7 from Equitable Land Co. on 22 December 1905.
- M. Grossman & Son leased 32,000 square feet of the space within the building present on Block 7 from Andrew McLean Company on 31 August 1938.
- Andrew McLean sold Lots 1 through 8 on Block 8 and Lots 1 through 6 on Block 9 to the Majestic Trading & Realty Company, Inc. on 6 April 1948.
- On 15 October 1948 Philip Levine, Jacob Adler, Benjamin Esterman, Charles Adler, and Paul Piekarsky each received a one-fifth share of the Majestic Trading & Realty Company.

- Arthur Sherin and Carrie Sherin leased approximately 1,118 square feet of the former Andrew McLean Mill for use as a cafeteria from the Majestic Trading & Realty Company, Inc. on 9 November 1949.

- Majestic Trading and Realty Company, Inc. sold its portion of the property to Chelton Realty Inc. on 28 February 1950.

- On 3 March 1959, Chelton Realty Inc. signed a proposed easement for a gas main on its property with Public Service Electric and Gas.

- A consent to sublease was signed by Chelton Realty, Inc. and St. Louis Terminal Field Warehouse Company on 23 February 1960.

The following chronological history of the site was compiled from a review of historical aerial photographs and Sanborn maps.

- 1899 - Sanborn Map

Two small portions of this site are depicted on the 1899 Sanborn map. Both areas are labeled Andrew McLean Company.

The area surrounding the site is moderately undeveloped, with the railroad and canal located to the west.

- 1903 - Sanborn Map

The 1903 Sanborn map does not indicate any significant changes to the site from the 1899 Sanborn map.

- 1910 - Sanborn Map

The entire site is depicted on the 1910 Sanborn map. Several large buildings were present on-site. The site was bordered by the railroad to the north and west, the Passaic River to the east and Sussex Avenue to the south. A railroad spur was also present on the property.

- 1935 - Sanborn Map

On the 1935 Sanborn map the site is labeled as a manufacturer of finished cotton goods and was still identified as the Andrew McLean Company.

Significant changes have not occurred to the surrounding area except general residential and commercial development.

- 1940 - Aerial Photograph

Several buildings, a large smokestack, a parking lot, and a railroad spur were present on-site.

The site was still bordered by the railroad to the north and west, the river to the east and residential properties to the south.

- 1951 - Sanborn Map

Review of the 1951 Sanborn map does not indicate any significant changes since 1940.

- 1951 - Aerial Photograph

The 1951 aerial photograph also does not indicate any significant changes since the 1940 aerial review.

- 1961 - Aerial Photograph

Vegetation appeared to be present along the railroad tracks. Disturbed soil (or debris) was present along the Passaic River side of the site. No other changes occurred to the site or the surrounding area.

- 1974 - Aerial Photograph

The 1974 aerial photograph indicates no changes to the site. The railroad located to the west of the site appeared to be no longer in operation.

- 1979 - Sanborn Map

The 1979 Sanborn map indicates that the building on site has numerous tenants. No other significant changes occurred to the site or surrounding area.

- 1991 - Sanborn Map

The 1991 Sanborn map does not indicate any significant changes to the site since 1979.

3.6.3 Environmental Setting

WESTON and NJDOT representatives conducted a site inspection of this property in 1991. The inspection focused on the exterior portion of the facility where roadway construction is planned. Most of this area was paved; however, several unpaved areas were located around the facility. A concrete pad below a former aboveground storage tank was noted adjacent to the facility.

Surface water runoff generated during storm events flows northwest towards the canal and to the storm sewers located within the complex.

Overburden encountered during soil boring activities conducted during the Task II investigation consisted of a silt, sand, and gravel fill material from 0 to 2 feet bgs. At depths greater than 2 feet bgs overburden consisted of dark, yellow-brown sand and silt. It is uncertain whether the sand and silt encountered in the borings was naturally occurring material or fill. Groundwater was encountered in the soil borings at 7 to 8 feet bgs. Groundwater flow direction at the site is unknown at present. Bedrock was not encountered during boring activities which extended to 10 feet bgs. Borings which were installed at a site approximately one-quarter mile from Site 7 as part of the Route 21 Geotechnical Investigation indicated that bedrock is approximately 90 feet bgs.

According to the USGS Maps of Flood Prone Areas and the National FIRM published by the U.S. Department of Housing and Urban Development, the portion of this site for which roadway construction activities are planned is not located within an area prone to flooding. Also, as indicated in the NJDOT *Ecology Technical Environmental Study* (1987), wetlands are not present within the property boundaries.

3.6.4 Description of AECs

3.6.4.1 Previously Identified AECs (Task II)

The Task II investigation focused on three primary areas of environmental concern: the area below the former location of an aboveground storage tank, a small area of visibly stained soil and stressed vegetation, and the inactive railroad spur located in the western portion of the site. Seven soil borings were installed throughout the site to identify contamination within these AECs. One surface soil sample was collected in the area of stained soil.

A total of eight soil samples were collected to determine whether soil conditions had been adversely impacted. One surface soil sample (07-SS1-001) was collected from the area of stressed vegetation and stained soil, at a depth of 0 to 24 inches bgs. This sample was analyzed for BN+15 and TPHs. Two soil borings were installed and two split-spoon samples (07-SB1-004,005) were collected from the former location of the aboveground tank. Five soil borings were installed and five split-spoon samples were collected from the location of the abandoned railroad tracks. Split-spoon samples were collected continuously during the installation of each soil boring from 0 to 10 feet bgs to characterize subsurface conditions. Soil samples were collected from the split spoons exhibiting evidence of contamination based on elevated readings on the HNu or visual observation. If evidence of contamination was not observed, then samples were collected from the split spoon sample taken immediately below the ground surface or immediately above the groundwater table. All samples collected during soil boring activities were analyzed for PP+40 and TPHs.

The analytical results of the samples collected are provided in Table 3-10. Only those compounds detected are listed in this table. Sample collection depths and comparisons to the NJDEP soil cleanup criteria are also provided. Sample locations are provided in Figure 3-7.

VOCs, SVOCs, and PPM were detected in a majority of the samples; however, only samples 07-SS1-001 and 07-SB1-004 contained contaminant concentrations exceeding the soil cleanup criteria. Sample 07-SS1-001 contained benzo(a)pyrene at 1.9 mg/kg, exceeding the soil cleanup criterion of 0.66 mg/kg, and sample 07-SB1-004 contained benzo(a)anthracene at a concentration of 4.1 mg/kg, which exceeded the criterion of 4.0 mg/kg.

Information obtained from NJDEP files for the ECRA investigation conducted at the site revealed that a 15,000-gallon fuel oil UST is located adjacent to the boiler room. This information was obtained following the Task II sampling and, therefore, was not addressed in this investigation. This UST will not be impacted by roadway construction.

3.6.4.2 Additionally Identified AECs

Additional AECs were not identified during a review of historical Sanborn maps and aerial photographs.

3.6.5 Implementation of the Remedial Investigation

No further action was proposed for Site 7 in the Remedial Investigation Work Plan. With NJDEP's approval of the Work Plan, however, a condition was made that NJDOT address the presence of benzo(a)pyrene at a formerly stained area. At the time of the Task II sampling, this stain was not extensive in nature (approximately 8 square feet) and surrounded a fire hydrant fixture. During an inspection of the area on 15 May 1995 it was determined that the area in question lies outside of the proposed Route 21 Freeway right-of-way. In addition, most of the previously stained area had been covered with gravel and paved with asphalt. As such, the area was not addressed in this investigation. In the addendum to the Work Plan, dated 18 May 1995, NJDOT requested no further investigative or remedial action at the site.

3.7 SITE 8 - NJDOT VACANT LOTS, BLOCK 51/LOTS,25A

The sampling proposed in the Site 8 RI Work Plan dated 27 August 1993, was implemented during October 1993. The results of the investigation were presented in the Site 8 Remedial Investigation Report dated 2 February 1994. For information concerning Site 8, including tables and figures, refer to the Site RI Work Plan and Site 8 RI Report.

Due to the need for an expedited environmental review of Site 8, RI activities were conducted prior to the remainder of the 4M/6J sites.

3.8 SITE 9 - DUNDEE WATER POWER COMPANY - DUNDEE CANAL, BLOCK 52/LOT 19

3.8.1 Property Description

Block 4.14, Lot 1 (Site 9) encompasses the Dundee Canal from the Passaic/Clifton border to Ackerman Avenue in Clifton, New Jersey. The canal is currently owned by the Dundee Water and Power Company. The lot extends nearly 1,300 linear feet and occupies roughly 2.5 acres.

This portion of the canal is adjacent to Block 4.15, Lot 1 (industrial property); Block 4.19, Lot 1 (industrial property); and Block 4.13, Lots 5 and 30 (Site 10). Stormwater runoff from several of these properties discharge to the canal. A discharge pipe leading into the canal from an adjacent industrial property was noted. Several steel pipes extend across the canal at different locations. Information pertaining to the function of those pipes was not available during the record review. In addition, household refuse, tires, wood and miscellaneous debris are present along the entire length of the canal.

3.8.2 Site History

The Dundee Canal was constructed during the late 1800s and was used for industrial transport in conjunction with railroad lines. The canal is not currently utilized for any purpose. The following is a chronological history of the canal summarized from aerial photographs and Sanborn maps.

- 1935 - Sanborn Map

  The 1935 Sanborn map shows the Dundee Canal extending from Ackerman Avenue to the Passaic/Clifton border.

  The canal was bordered by the Ackerman Avenue bridge to the north and Passaic/Clifton border to the south, with undeveloped land and the Clifton Paper Board Company, currently the Garden State Paper Company, located on the eastern bank. The lot was bounded by the Forstmann Woolen Company (Worsted Mills) and undeveloped land to the west.

  The Clifton Paper Board Company had two "Acid Tanks" and a "Coal Pile" bordering on the canal and the Woolen Company had a 1,500-gallon pump on the canal.

- 1940 - Aerial Photograph

  An area of soil disturbance or debris was evident on the southeastern shoreline. Evidence of a "coal pile" is not visible on the eastern shore as noted on the 1935 Sanborn map.

- 1951 - Sanborn Map

A "Filling Station" was constructed 50 feet from the western bank of the canal on Ackerman Avenue (Site 10).

- 1951 - Aerial Photograph

Vegetation had replaced the disturbed soils evident in the 1940 aerial photograph. It also appears that the manufacturing facility on the eastern shore of the canal (Clifton Paper Board Company) was discharging into the canal. Other significant changes were not evident at the site or the surrounding area from 1940 to 1951.

- 1952 - Sanborn Map

There were no significant changes to the site or surrounding area since 1951.

- 1961 - Aerial Photograph

The 1961 aerial photograph indicates that drums were stored adjacent to the manufacturing facility (Clifton Paper Board) on the eastern shore. Additional land was also paved on the northwestern shore. There are no other significant changes to the site or surrounding area on this photograph.

- 1965 - Sanborn Map

The 1965 Sanborn map indicates that the Clifton Paper Board Company had changed its name to the Whippany Paper Board Company, Inc. - Clifton Plant. Also, the Forstmann Woolen Company on the western shore had changed its name to the Duralite Company, an outdoor furniture manufacturer.

- 1970 - Sanborn Map

Review of the 1970 Sanborn map indicates no changes since 1965.

- 1974 - Aerial Photograph

Additional vegetation had grown along both shorelines since 1961. The drums which were present on the eastern shore in 1961 had been removed and replaced with tractor trailers.

- 1984 - Sanborn Map

The filling station which was located 50 feet from the western bank of the canal on Ackerman Avenue was no longer present. No other significant changes to the site are evident when compared to 1974.

3.8.3 Environmental Setting

This section of the Dundee Canal receives stormwater runoff from numerous commercial, industrial and residential properties located on the eastern and western banks of the canal. Water in the canal flows slowly from south to north.

Sediment depths were not established during the Task II and III investigations; however, borings were installed in the Passaic River adjacent to the northern terminus of the canal during the 1992 NJDOT Route 21 Geotechnical Investigation. Sediment depths of approximately 7 to 9 feet were observed in the borings installed within the Passaic River. Top of bedrock within these borings was encountered from 25 to 90 feet bgs.

A wetland encompassing approximately 0.01 acre is located on the western bank of the Dundee Canal south of the Ackerman Avenue Bridge. The wetland consists of arrow arum, broad-leaved arrowhead, pickerelweed and water purslane.

Although the water in the Dundee Canal has not been given a water quality designation by NJDEP, it would most likely be FW2-NT. Historically, mills along the canal discharge industrial effluent into the canal. Testing performed in 1986 by the NJDOT revealed high levels of ammonia and phosphate. Levels of turbidity, chlorides, suspended solids, pH and DO were within NJDEP standards for FW2-NT waters.

3.8.4 Description of AECs

3.8.4.1 Previously Identified AECs

The primary environmental concern at this site is from the potential for contamination within the canal, which may have resulted from historical use of the canal for industrial purposes (discharges, transportation) or contamination from nonpoint sources (stormwater runoff). Using a PONAR sampler, one sediment sample was collected from 0 to 12 inches below the bottom of the canal during the Task II investigation. The sample was obtained in the center of the canal adjacent to the current Garden State Paper Company property. The sediment sample was analyzed for PP+40 and TPHs and screened using an HNu.

The analytical results for the sample collected are provided in Table 3-11. Only those compounds detected are listed in this table. The sample collection depth and a comparison to NJDEP sediment quality criteria are also provided. The sample location is provided in Figure 3-8.

Analytical results of the sediment sample identified several SVOCs (CaPAHs) and metals (mercury, lead, and zinc) at concentrations exceeding the ER-L sediment quality criteria. The reported concentration for lead (170 mg/kg) also exceeded the ER-M criteria of 110 mg/kg.

The vertical extent of the sediment contamination has not been determined. Surface water quality is also a concern in the canal based on the results of the sediment sampling and land use in the area.

3.8.4.2 Additionally Identified AECs

This site consists of a large section of the Dundee Canal from Ackerman Avenue to the Clifton/Passaic border. Major concerns center around industrial sites that have existed on or near the banks of the canal and may have had releases that migrated into the canal.

Historically, there have been two major industrial plants bordering this section of the canal: Clifton Paper Board facility on the eastern bank and the Forstmann Woolen Company/Duralite on the western bank. In the 1951 aerial photograph it appears that the Clifton Paper Board company was discharging into the canal. The 1961 aerial photograph indicates that drums were stored adjacent to the facility. On the western bank, the Forstmann Woolen Company was present from before 1935 to 1965 when this facility became the Duralite Company, a manufacturer of outdoor furniture.

In 1951 a filling station was located 50 feet from the canal on Ackerman Avenue. By 1984 this station had been demolished.

3.8.5 Implementation of the Remedial Investigation

To further delineate the vertical extent of contamination in the canal at Site 9, two borings were completed from 0 to 10 foot below the canal bottom. Boring locations, shown on Figure 3-8, were limited to the 700-foot section of the canal which will be impacted by construction.

Three soil samples were collected from each boring in accordance with NJDEP's "Guidance For Sediment Quality Evaluation," (March 1991). The samples were collected from the surface (0 to 6 inches below the canal bottom), the mid-range, and the bottom of the borings. The mid-range sample was biased toward soils showing evidence of contamination (i.e., elevated PID measurements or visual staining). When no evidence of contamination was observed, the mid-range samples were collected from 5 to 5.5 feet below the canal bottom, and the bottom samples were collected from the 9.5- to 10-foot interval below the canal bottom.

Sediment samples were analyzed for BNA+20, TAL inorganics, TOC, pH, Dioxin/Furan, and particle grain size.

One composite sample was collected from each boring, by combining equal portions of the surface, mid-range and bottom samples. The composite samples were analyzed for disposal characteristics, including full TCLP parameters, reactivity and PCBs in order to identify disposal and/or treatment options prior to excavation.

One surface water sample was collected from this portion of the canal. The sample was analyzed for TCL+30, TAL inorganics, total coliform, fecal coliform, total suspended solids (TSS), total dissolved solids (TDS), and oil and grease.

3.8.6 Results of the Remedial Investigation

The analytical results for the Site 9 sediment samples indicated that ER-L sediment quality guidelines were exceeded for all eleven SVOC compounds assigned quality guideline criteria. Nine of the ER-M sediment quality guidelines were also exceeded. One or more of the SVOC compounds were detected above sediment quality guidelines in each of the six soil samples. The remaining SVOC compounds identified by the analyses were either below the detection limits for the analytical method used, or present at concentrations below the sediment quality guidelines.

All 22 TAL inorganics were detected in most of the sediment samples collected. However, antimony, cadmium, chromium, copper, lead, mercury, nickel, and zinc were detected in the majority of the samples at concentrations exceeding the ER-L criteria. ER-M criteria was also exceeded in 22 of the samples. With the exception of arsenic, all TAL inorganic compounds identified in the NJDEP, "Guidance for Sediment Quality Evaluation," were present above sediment quality criteria. TOC ranged from 5,000 mg/kg (09-SD2-01B) to 127,000 mg/kg (09-SD2-01A), and pH varied between 6.6 and 7.0. Table 3-12 presents a summary of the analytical results for sediment samples.

Seventeen dioxin compounds were detected in one or more of the samples collected. Concentrations range up to 22,590 ppt. No cleanup criteria are in effect for dioxins.

Particle grain size analysis for the Site 9 samples indicate that the sediment samples vary from location 09-SD2-01 to 09-SD2-02; however, the variation with depth is relatively minor. The surface sample at location 09-SD2-01 is predominantly silt and clay with some sand and trace amounts of gravel. The sand content decreases slightly from the surface sample to the bottom sample. At location 09-SD2-02 the surface sample is predominantly sand with some clay and silt and trace amounts of gravel. The amount of clay and silt in the sample varies from the surface to bottom sample, first decreasing in the mid-range sample then increasing in the bottom sample. Particle size analysis documents are provided in Appendix D.

Waste classification (TCLP) analysis, performed on the sediment samples, indicates that all parameters analyzed were below the criteria classifying the sediments as hazardous waste. Sediment samples were also determined to be nonreactive. Results of the waste classification analyses for SVOCs, VOCs, Pest/Herb, PCBs and metals are presented in Table 3-13, in Appendix C.

The surface water sample obtained at Site 9 was analyzed for VOCs, SVOCs, Metals, oil and grease, total coliform, fecal coliform, TDS, TSS and pH. All parameters with the exception of fecal coliform were either present at levels below the NJDEP FW2-NT surface water standards or below method detection limits. Fecal coliform (1,600 counts/100 mL) exceeded the FW2-NT surface water standard of 200 counts/100 mL). Results of the surface water analytical testing are summarized on Table 3-14 in Appendix C.

3.8.7 Nature and Extent of Contamination

Based on the laboratory analysis, sediment to a depth greater than 10 feet below the bottom of the canal, exceed the NJDEP sediment Quality Guidance Criteria for TAL metals and SVOCs. Contaminant concentrations do not vary consistently with depth or in the upstream/downstream direction. Peak concentrations occur in surface, mid-range, and bottom samples.

Construction of the roadway may require construction personnel to come in direct contact with the contaminated sediments. In order to avoid exposure, remediation of the sediments may be conducted prior to construction. If remediation is not required, construction personnel should be health-and-safety-trained and provided with adequate protective equipment and clothing.

Construction of retaining walls, abutments, piers or filling of the canal may require the removal of sediment and water. Dewatering may be required prior to removal of the sediment. Sediment removed from the canal is not considered hazardous waste, based on the waste classification analysis performed during the RI. Additional waste classification analysis will be required during the removal activities.

3.9 SITE 10 - NJDOT/SBH REALTY ASSOCIATION, BLOCK 4.13/LOT 5, 30

3.9.1 Property Description

Site 10 consists of two properties: Block 4.13/Lot 30, which is owned by the NJDOT, and Block 4.13/Lot 5, which is owned by SBH Realty Association (SBH Realty). Site 10 is located at the corner of Ackerman Avenue and Cheever Avenue in Clifton, New Jersey. The two properties encompass over 2 acres. A commercial gasoline station owned by Chevron Oil Company was present on site from approximately 1950 to 1972. Most of the property the gasoline station occupied is currently owned by the NJDOT; however, a small portion of the gasoline station property may be owned by SBH Realty. Property boundary information was not available during the historical record review. A large one-story structure lies within the western portion

of the SBH Realty property. The current use of this building is unknown. The building appears to contain a commercial business.

Representatives of WESTON and the NJDOT conducted a site inspection during the Task II investigation. A fill pipe was noted extending from a concrete pad near the center of the NJDOT lot, presumably from a UST. Staining was also observed in this area.

The site is situated within a mixed residential and commercial community. The site is bounded by the Dundee Canal to the northeast and by Ackerman Avenue to the north. Immediately opposite the site to the north of Ackerman Avenue is vacant land (Site 12) and commercial properties. The site is bounded to the southwest by commercial businesses. Vacant land abuts the site to the southeast.

3.9.2 Site History

The following section details the history of the site and surrounding properties. This information was obtained from review of title searches, historical aerial photographs and Sanborn maps.

LOT 30:

The site was vacant prior to 1935. A building was constructed on the property between 1935 and 1940 and a gasoline service station opened for business in that building between 1940 and 1951. The Chevron Oil Company operated the service station until 1972. The building was removed sometime between 1974 and 1984.

Title searches disclosed the following ownership history:

- Louis Rudbart and Anna Rudbart sold the property to Petroleum Holding Co. on 25 January 1944.
- Petroleum Holding Co. sold the property to Home Oil Co. on 31 January 1947.
- Home Oil Co. sold the property to Lawrence P. Marron and Joseph T. Foley, trading under name of Home Oil Co. on 30 January 1954.
- Lawrence P. Marron and Joseph T. Foley sold the property to Chevron Oil Co. on 5 March 1954.
- Chevron Oil Co. sold the property to NJDOT on 14 February 1972.

The following chronological history of the site was compiled from the title search and through a review of aerial photographs and Sanborn maps.

- 1935 - Sanborn Map

The property consisted of vacant land in 1935. The site was bordered to the north by Ackerman Avenue, to the south and the west by vacant land, and to the east by the Dundee Canal.

- 1940 - Aerial Photograph

Review of the 1940 aerial photograph indicates that a building had been constructed on the property. The surrounding area had remained the same with the exception of residential and commercial development to the west of the site.

- 1951 - Sanborn Map

The 1951 Sanborn map indicates that the building was a "filling-station." The surrounding area had undergone additional residential and commercial development since 1940. A "Wire and Cable Works" was located north of the site across Ackerman Avenue.

- 1951 - Aerial Photograph

A large portion of the site had been paved and a larger building had replaced the smaller one shown on the 1951 Sanborn map. A number of cars are parked on site, indicating that the facility was in operation. A large building was constructed southwest of the site.

- 1952 - Sanborn Map

There have been no significant changes within the site since 1951.

- 1961 Aerial Photograph

Review of the 1961 aerial photograph indicates no significant changes within the site since 1952. Gasoline pumps were visible on the section of the property bordering Ackerman Avenue.

- 1965 - Sanborn Map

The site continued to be used as a filling station.

- 1970 - Sanborn Map

The 1970 Sanborn map indicates that no significant changes had occurred on the site since 1965. The building across Ackerman Avenue was no longer present.

- 1974 - Aerial Photograph

The two gasoline pumps visible in earlier aerial photographs adjacent to Ackerman Avenue had been removed, and this section of the property was being used for parking. Changes to the area surrounding the site included additional paving to the south and demolition of the building just west of the site.

- 1984 - Sanborn Map

The filling station has been removed and the entire site was vacant.

LOT 5:

Lot 5 surrounds Lot 30 on three sides and also borders Ackerman Avenue. The following is a chronological history of the site.

- 1935 - Sanborn Map

The site is bounded by Ackerman Avenue to the north, the Dundee Canal to the east, the Forstmann Woolen Company (across Durant Avenue) to the south and commercial/ residential properties to the west. There were several small buildings on the site located in the northwestern corner of the lot.

- 1940 - Aerial Photograph

The 1940 aerial photograph confirmed the presence of the building seen on the 1935 Sanborn map. Several cars were seen on the western side of the site.

- 1951 - Sanborn Map

Two private garages had been constructed on the western portion of the site. One of the buildings included a boiler room. Adjacent to the site, a filling station had been constructed (as indicated in the Lot 30 history). A large building was constructed on the western side of the site.

- 1951 - Aerial Photograph

The 1951 aerial photograph confirms the site features that were included in the 1951 Sanborn map. The 1951 aerial photograph also showed that several cars were parked on the site indicating that it was active.

- 1952 - Sanborn Map

There had been no significant changes within the site or surrounding area since 1951.

- 1961 - Aerial Photograph

Additional paving had been added to the southeastern portion of the site.

- 1965 - Sanborn Map

The site has not changed significantly since 1952.

- 1970 - Sanborn Map

The site remained unchanged since the 1965 Sanborn map.

- 1974 - Aerial Photograph

The small buildings identified in the northwestern portion of the lot have been removed and several trailers were visible within the parking lots.

- 1984 - Sanborn Map

Significant changes have not occurred within the site since the 1970 Sanborn map. A gasoline filling station was constructed to the west, on the corner of Randolph and Ackerman Avenue.

3.9.3 Environmental Setting

WESTON and NJDOT representatives conducted a site inspection of this property in 1991. At the time of the inspection, the majority of the lots were covered by asphalt and concrete. The remainder of the property was unpaved. The site topography is generally flat and slopes towards the Dundee Canal to the east. Surface water runoff generated during storm events appears to flow both into the Dundee Canal and towards Ackerman Avenue. Access to the property is limited by a 6-foot-high chain-link fence enclosing the site.

Overburden encountered during soil boring activities conducted during the Task II investigation was comprised primarily of fill material consisting of silt, sand, and gravel with a trace of clay. Groundwater was encountered at approximately 7 feet bgs. Groundwater flow direction is unknown at present; however, general topographic features indicate that groundwater may flow toward the Dundee Canal. Bedrock was not encountered during boring activities which extended to 18 feet bgs.

According to the National FIRM, published by the U.S. Department of Housing and Urban Development, this site is not located within an area prone to flooding. Also, as indicated in the NJDOT *Ecology Technical Environmental Study* (1987), wetlands are not present within the property boundaries.

3.9.4 Description of AECs

3.9.4.1 Previously Identified AECs (Task II)

The Task II investigation focused on one area of environmental concern: a fill pipe extending from a concrete pad near the center of the NJDOT lot, presumably from a UST. Surface staining was also observed in this area.

Three soil borings were installed downgradient of the fill pipe and suspected UST location to determine whether the storage of product in USTs had adversely impacted soil conditions. The locations of downgradient borings were based on topographic and hydrologic features. The soil borings were installed to a depth of 15 to 18 feet bgs which corresponds to the assumed invert depth of the tanks. One sample was collected from each boring and analyzed for PP+40 and TPHs.

The analytical results of the samples collected are provided in Table 3-15. Only those compounds detected are listed in this table. Sample collection depths and comparison of analytical results to the NJDEP soil cleanup criteria are also provided. Sample locations are provided in Figure 3-10.

SVOCs, PPMs, and phenols were detected in the samples collected. The concentration of all compounds detected in all samples were below the NJDEP soil cleanup criteria.

3.9.4.2 Additionally Identified AECs

Additional AECs were not identified during a review of historical Sanborn maps and aerial photographs.

A review of aerial photographs and Sanborn maps indicate that a gasoline filling station was historically present on site. A fill pipe, extending from the concrete pad near the center of the NJDOT lot, was considered an indication that one or more USTs may still be present on the site.

3.9.5 Implementation of the Remedial Investigation

To confirm the presence of and locate USTs potentially on the property, a geophysical survey was performed. GPR and a magnetometer were used to investigate the area of the fill pipe and the perimeter of the former building. Appendix A contains a method summary of the GPR and magnetometer investigations. Figure 3-10 provides locations for GPR and magnetometer

anomalies. Figure 3-11 is an example of a GPR profile with subsurface features identified. Both figures are located in Appendix B.

Results of the geophysical survey indicate several areas where USTs may still exist. In accordance with the RI Work Plan, an intrusive investigation was conducted using a backhoe, visual observations, and screening instrumentation to identify USTs or areas of potential contamination. Each area identified during the geophysical investigation was excavated to a depth below and a distance beyond that of the anticipated GPR and magnetometer anomaly. Soils removed from the excavation were screened using an HNu photoionization detector (PID) regardless of soil type and color.

3.9.6 Results of the Remedial Investigation

As a result of the geophysical and intrusive investigation, no evidence of USTs was found. It appears that the tanks had been removed in the past. Field screening using the HNu PID did not indicate the presence of contamination, and no visual observations of staining or odors were noted.

Based on this investigation, no further action is recommended for Site 10.

3.10 SITE 11 - DUNDEE DAM, BLOCK 3.17/LOT 1

3.10.1 Property Description

Block 3.17, Lot 1 (Site 11) encompasses the Dundee Canal from Ackerman Avenue to its terminus at the Passaic River. The canal is owned by the Dundee Water and Power Company. This portion of the canal encompasses approximately 3.5 acres (1900 LF).

This section of the canal is bordered by Block 3.14, Lot 34 (vacant lot); Block 3.15, Lot 10 (commercial property); Block 3.16, Lot 2 (industrial property); Block 3.16, Lot 4 (vacant lot); and 3.14, Lot 33 (vacant lot). Wood, tires, metal and miscellaneous debris are presently scattered in and along the canal.

3.10.2 Site History

The Dundee Canal was constructed during the late 1800s and was used for industrial transport in conjunction with railroad lines. The canal is not currently used for any purpose. The site consists of the Dundee Canal from Ackerman Avenue at the south to the Dundee Dam at the north. This review is centered on properties and facilities adjacent to the canal; these properties may have historically impacted the canal by stormwater runoff and effluent discharges.

The following chronological history of the site was compiled from a review of aerial photographs and Sanborn maps.

- 1935 - Sanborn Map

In 1935, the canal was bordered by an industrial complex and the Dundee Textile Company on its eastern bank. The complex was comprised of a "Silk Factory" and a "Paperbox Factory". The canal was bordered by a "textile engineering" facility on its western bank at Ackerman Avenue. There was a large amount of vacant land bordering the canal.

- 1940 - Aerial Photograph

The 1940 aerial photograph confirms features noted in the 1935 Sanborn map, showing several industrial complexes and vacant land along the canal.

- 1951 - Sanborn Map

Three significant changes occurred adjacent to the canal: 1) the building formerly designated as a "Textile Engineering" facility changed to a "Wire and Cable Works", 2) the former Dundee Textile Company was sold to the Tide Water Realty Company, and 3) residential buildings were constructed on the western shore of the canal.

- 1951 - Aerial Photograph

Several houses had been constructed along the western shoreline, as noted in the 1951 Sanborn map. The "Wire and Cable Works" had expanded its operations on the western shore. The land along the northeastern shore remained vacant.

- 1952 - Sanborn Map

Significant changes had not occurred within the site since 1951.

- 1961 - Aerial Photograph

The area surrounding the canal remained unchanged since 1951.

- 1965 - Sanborn Map

The former "Wire and Cable Works" building changed designation and was now labeled a "Coating Works" company. The area within and around the site remained unchanged since 1952.

- 1970 - Sanborn Map

The "Coating Works" building and residences on the western shore had been removed. The area surrounding the canal had no other significant changes.

- 1974 - Aerial Photograph

The 1974 aerial photograph confirms the "Coating Works" had been removed as depicted in the 1970 Sanborn map. An area of soil disturbance was visible along the eastern shore of the canal, north of the industrial complex.

- 1984 - Sanborn Map

The area surrounding the canal remained unchanged since 1974.

3.10.3 Environmental Setting

This section of the Dundee Canal receives stormwater runoff from numerous commercial, industrial and vacant properties located on the eastern and western banks of the canal. Water in the canal flows slowly from south to north.

Sediment depths beneath the canal were not established during the Task II investigation; however, borings were installed in the Passaic River adjacent to the northern terminus of the canal during the 1992 NJDOT Route 21 Geotechnical Investigation. Sediment depths ranged from 7 to 9 feet in borings installed within the Passaic River. Bedrock was encountered within these borings from 25 to 90 feet bgs.

There are no wetlands along this portion of the Dundee Canal. Depth to groundwater below the canal was not established during the Task II and III investigations; however, groundwater was encountered in borings adjacent to the canal at a depth of 8 to 10 feet bgs.

Although the water in the Dundee Canal has not been given a water quality designation by NJDEP, it would most likely be Fresh Water 2 Non-Trout (FW2-NT). Historically, mills along the canal discharged industrial effluent into the canal. Testing performed in 1986 by the NJDOT in the section of the canal encompassed by Block 54A/Lot 1 revealed high levels of ammonia and phosphate. Levels of turbidity, chlorides, suspended solids, pH and dissolved oxygen (DO) were within NJDEP standards for FW2-NT waters at the NJDOT sampling site.

3.10.4 Description of AECs

3.10.4.1 Previously Identified AECs

The primary environmental concern at this site is the potential for contamination within the canal, which may have resulted from historical use of the canal for industrial purposes (discharges, transportation) or contamination from nonpoint sources (stormwater runoff). Using a PONAR sampler, one sediment sample was collected from 0 to 12 inches below the bottom of the canal. The sample was collected in the center of the canal adjacent to Island Equities

Industrial Complex. The sediment sample was analyzed for PP+40 and TPHs and screened using a HNu.

The analytical results for the sediment sample are provided in Table 3-16. Only those compounds detected are listed in this table. Sample collection depths and comparison to the NJDEP sediment quality criteria are also provided. The sample location is provided in Figure 3-12.

The analytical results of the sediment sample collected within the canal identified eight SVOCs with concentrations exceeding the NJDEP ER-M sediment quality criteria. The sediment sample also had a lead concentration of 81.7 mg/kg, exceeding the ER-L standard of 35 mg/kg, but less than the ER-M standard of 110 mg/kg. In addition, the sediment sample contained 1700 mg/kg of TPHs. Based on this data point and the results of the sediment samples collected in Sites 2 and 9, it is plausible that the majority of the surface sediments within the canal contain elevated levels of contaminants. The sample collected represents conditions from the first 12 inches of bottom sediment. The vertical and horizontal extent of the contamination has not been determined. Surface water quality is also a high concern based on the results of the sediment sampling and land use in the area.

3.10.4.2 Additionally Identified AECs

There were no additional areas of environmental concern identified during the historical record review.

3.10.5 Implementation of the Remedial Investigation

To further delineate the vertical extent of contamination and to further characterize the nature of contamination, a total of three borings were completed from 0 to 10 feet below the canal bottom. Boring locations, shown on Figure 3-12, were limited to the 1,100-foot section of the canal which will be impacted by construction.

Three soil samples were collected from each boring in accordance with NJDEP's "Guidance For Sediment Quality Evaluation" (March 1991). The samples were collected from the surface (0 to 6 inches below the canal bottom), the mid-range, and the bottom of the borings. The mid-range sample was biased toward soils showing evidence of contamination (i.e., elevated PID measurements or visual staining). When no signs of contamination were observed, the mid-range samples were collected from 5 to 5.5 feet below the canal bottom, and the bottom samples were collected from the 9.5- to 10-foot interval below the canal bottom.

Sediment samples were analyzed for BNA+20, TAL inorganics, TOC, pH, dioxin/furan and particle grain size.

One composite sample was collected from each boring, by combining equal portions of the surface, mid-range and bottom samples. The composite samples were analyzed for disposal characteristics, including full TCLP parameters, reactivity and PCBs in order to identify disposal and/or treatment options prior to excavation.

One surface water sample was collected from this portion of the canal. The sample was analyzed for TCL+30, TAL inorganics, total coliform, fecal coliform, TSS, TDS, and oil and grease.

3.10.6 Results of the Remedial Investigation

The analytical results for the Site 11 sediment samples indicated that ER-L and ER-M sediment quality guidelines were exceeded for 10 of the 11 SVOC compounds assigned quality guideline criteria. Naphthalene with ER-L and ER-M guideline criteria of 0.34 mg/kg and 2.1 mg/kg, respectively, remained below detection levels in all samples except 11-SD2-01A (0.13 mg/kg). Approximately half of the compound concentrations exceeding ER-L guidelines also exceeded the ER-M criteria. One or more of the SVOC compounds were detected above sediment quality guidelines in each of the nine samples. The remaining SVOC compounds, identified by the analyses, were either below detection limits for the analytical method used, or present at concentrations below the sediment quality guidelines.

All 22 TAL inorganics were detected in most of the sediment samples collected. However, antimony, cadmium, chromium, copper, lead, mercury, nickel, and zinc were detected above the ER-L quality guidance criteria. The analytes cadmium, lead, mercury, and zinc were also found above the ER-M criteria in several of the samples tested. With the exception of arsenic, all TAL inorganic compounds identified in the NJDEP, "Guidance for Sediment Quality Evaluation," were present above sediment quality criteria. TOC ranged from 10,100 mg/kg (11-SD2-03C) to 73,200 mg/kg (11-SD2-02A), and pH varied between 6.5 and 7.3. Table 3-17 presents a summary of the analytical results for sediment samples.

Seventeen dioxins were detected in one or more samples. Concentrations range up to 6,800 ppt. No cleanup criteria are in effect for dioxins.

Particle grain size analysis generally indicates that the sediment samples were sands with silt and clay portions varying from 10 percent to 42 percent of the sample weight. In two locations, samples 11-SD2-01C and 11-SD2-03A, the ratio of sand to silt and clay shifts, making the silt and clay portion more predominant by a small margin. Gravel is present in most of the samples at volumes of 2 percent to 15 percent of the sample by weight. Particle size analysis documentation is presented in Appendix D.

Waste classification (TCLP) analysis performed on the sediment samples, indicated that all parameters analyzed were below the criteria classifying the sediments as hazardous waste. Sediment samples were also determined to be nonreactive. Results of the waste classification

analyses for SVOCs, VOCs, Pest/Herb, PCBs and metals are presented in Table 3-18 in Appendix C.

The surface water sample obtained at Site 11 was analyzed for VOCs, SVOCs, metals, oil and grease, total coliform, fecal coliform, TDS, TSS and pH. All parameters were either present at levels below the NJDEP FW2-NT surface water standards or below method detection limits. Results of the surface water analytical testing are summarized on Table 3-19 in Appendix C.

3.10.7 Nature and Extent of Contamination

Based on the laboratory analysis, sediment to a depth greater than 10 feet below the bottom of the canal exceeds the NJDEP Sediment Quality Guidance Criteria for TAL metals and SVOCs. Contaminant concentrations dod not vary consistently with depth or in the upstream/downstream direction. Peak concentrations occur in surface, mid-range, and bottom samples.

Construction of the roadway may require construction personnel to come in direct contact with the contaminated sediments. In order to avoid exposure, remediation of the sediments may be conducted prior to construction. If remediation is not required, construction personnel should be health-and-safety-trained and provided with adequate protective equipment and clothing.

Construction of retaining walls, abutments, piers or filling of the canal may require the removal of sediment and water. Dewatering may be required prior to removal of the sediment. Sediment removed from the canal is not considered hazardous waste, based on the waste classification analysis performed during the RI. Additional waste classification analyses will be required during the removal activities.

3.11 SITE 12 - NJDOT VACANT LOTS, BLOCK 3.14/LOT 34

3.11.1 Property Description

Block 3.14, Lot 34 (Site 12) is located at the intersection of Ackerman Avenue and Cheever Avenue in Clifton, New Jersey. The 1.8-acre site is currently vacant and is owned by the NJDOT. A textile engraving plant previously occupied the site. All former structures have been removed.

The site is situated within a mixed residential and commercial community. The Dundee Canal (Site 11) is located north of the property. Site 10, owned by the NJDOT and SBH Realty, is located opposite Ackerman Avenue to the southeast. A commercial business is in operation on the SBH Realty site. Residential buildings and a commercial business are located southwest of the site on Cheever Avenue.

3.11.2 Site History

Historical Sanborn maps indicate that a "Textile Engineering" shop, a "Wire and Cable Works", and a "Coating Works" facility have occupied the site at different periods since 1935. Between 1961 and 1970 the buildings on site were demolished and the site has remained vacant to the present.

Site 12 is comprised of the following parcels: 45, 47, 48, 49, 50, 51, and 52. Title information for parcels 47 and 50 is not available. Title searches for the remaining parcels disclosed the following ownership history:

Parcel 45:

- Dundee Water Power and Land Co. sold the parcel to Botany Worsted Mill on 20 February 1904.
- Botany Worsted Mills sold the parcel to John Henry Realty on 24 May 1929.
- John Henry Realty sold the parcel to Rowland Johnson Co. on 7 February 1939.
- The Rowland Johnson Co. sold the parcel to the City of Clifton on 11 September 1940.
- Angelo Zuliani and Julia (his wife) and Aldo Zuliani and Maria (his wife) sold the parcel to Nathan Grober and Rose (his wife) on 25 April 1955.
- Nathan Grober and Rose (his wife) sold the parcel to Protective Coating Corp. on 26 July 1960.
- Protective Coating Corp. sold the parcel to NJDOT on 23 April 1968.

Parcel 48:

- The Rowland Johnson Co. sold the parcel to the City of Clifton on 12 November 1940.
- The City of Clifton sold the parcel to Aksel A. Arnessen on 8 April 1942.
- Aksel A. Arnessen and Johanne (his wife) sold the parcel to John A. Celentano on 27 April 1942.
- John A. Celentano and Susan (his wife) sold the parcel to Louis DeLotto and Pauline (his wife) on 2 January 1945.

- Louis DeLotto and Pauline (his wife) sold the parcel to Mario Regoli on 7 September 1946.

- Mario Regoli and Katherine (his wife) sold the parcel to Salvatore Criscione and Helen (his wife) on 16 July 1949.

- Foreclosure of property on 20 April 1955.

- Paterson Realty Corp. sold the parcel to Samuel S. Merlo and Philomena (his wife) on 17 January 1956.

- Samuel Merlo and Philomena (his wife) sold the parcel to Philomena Merlo on 26 May 1965.

- Samuel S. Merlo, widower sold the parcel to Samuel L. Merlo and Louise G. (his wife) on 15 December 1965.

- Samuel L. Merlo sold the parcel to NJDOT on 11 August 1967.

Parcel 49:

- The City of Clifton sold the parcel to Henry L. Peto on 13 April 1944.

- Henry L. Peto and Vera (his wife) sold the parcel to John A. Celentano and Susan (his wife) on 14 April 1944.

- John A. Celentano and Susan (his wife) sold the parcel to Louis DeLotto and Pauline (his wife) on 2 January 1945.

- Louis DeLotto and Pauline (his wife) sold the parcel to Frank Juschitsch on 9 November 1946.

- Frank Juschitsch and Hermine (his wife) sold the parcel to the NJDOT on 22 September 1967.

Parcel 51:

- The City of Clifton sold the parcel to Louis DeLotto on 1 February 1946.

- Louis DeLotto and Pauline (his wife) sold the parcel to Victor G. Boscia on 8 November 1946.

- Victor G. Boscia sold the parcel to Frank Lizzi and Josephine (his wife) on 11 October 1947.

- Frank Lizzi and Josephine (his wife) sold the parcel to Josephine Lizzi on 15 July 1952.

- Josephine Lizzi and Frank (her husband) sold the parcel to Albert A. Pison and Gertrude (his wife) on 30 November 1959.

- Albert A. Pison and Gertrude (his wife) sold the parcel to the NJDOT on 12 August 1967.

Parcel 52:

- Dundee Water Power and Land Co. sold the parcel to Botany Worsted Mills on 20 February 1904.

- Botany Worsted Mills sold the parcel to John Henry Realty on 14 August 1929.

- John Henry Realty Co. sold the parcel to Rowland Johnson Co. on 7 February 1939.

- Rowland Johnson Co. sold the parcel to the City of Clifton on 11 September 1940.

- The City of Clifton sold the parcel to Louis DeLotto on 1 February 1946.

- Louis DeLotto and Pauline (his wife) sold the parcel to George Kretschmar and Anna (his wife) on 8 February 1947.

- George Kretschmar sold the parcel to Anna Kretschmar on 5 August 1952.

- Anna Ferrante (formerly Anna Kretschmar) and Joseph (her husband) sold the parcel to Joseph S. Ferrante and Anna (his wife) on 24 October 1955.

- Joseph S. Ferrante and Anna (his wife) sold the parcel to the NJDOT on 2 May 1967.

The following chronological history of the site was compiled from the title search and through review of aerial photographs and Sanborn maps.

- 1935 - Sanborn Map

The property was primarily vacant with the exception of a "Textile Engineering" shop located in the southeastern portion of the site. Surrounding the site was vacant land to the south, an auto repair shop, filling station, and residential housing to the west, and the Dundee Canal to the east and north.

- 1940 - Aerial Photograph

There were no significant changes within the site or surrounding area since 1935.

- 1951 - Sanborn Map

The area surrounding the site had become more developed. A gasoline filling station had been constructed to the south of the site opposite Ackerman Avenue. Six houses had been constructed along Cheever Avenue. The former "Textile Engineering" building located on site had expanded in size and was designated as a "Wire and Cable Works" facility.

- 1951 - Aerial Photograph

Review of the 1951 aerial photograph confirmed the development of the area surrounding the site that was evident in the 1951 Sanborn map.

- 1952 - Sanborn Map

There were no significant changes within the site or surrounding area since 1951.

- 1961 - Aerial Photograph

The 1961 aerial photograph does not indicate any significant changes from the 1951 aerial photograph.

- 1965 - Sanborn Map

The former "Wire and Cable Works" building present on site had changed operations becoming a "Coating Works".

- 1970 - Sanborn Map

The building identified in the 1965 Sanborn map as a "Coating Works" and the northern residences had been removed or demolished. The site was vacant.

- 1974 - Aerial Photograph

The area where the "Coating Works" had formerly been located was being used as a parking area. The surrounding area had not changed significantly.

- 1984 - Sanborn Map

There were no significant changes within the site since 1974.

3.11.3 Environmental Setting

WESTON and NJDOT representatives conducted a site inspection of this property in 1991. At the time of the 1991 inspection the lot was vacant, except for a large mound of fill material in the southeastern portion of the site. Debris such as wood, concrete, and scrap metal was located adjacent to the tree line which parallels the Dundee Canal. An additional site inspection was conducted by WESTON in 1992. The mound of fill material formerly present on site had been removed prior to this inspection. Site topography slopes eastward with most of the surface water runoff generated during storm events flowing east toward the Dundee Canal.

The overburden encountered during the excavation of test pits during the Task II investigation was comprised of sand with traces of gravel. Groundwater was not encountered during the subsurface evaluation at this site. Groundwater flow direction is unknown at present; however, general topographic features indicate that groundwater may flow east toward the Dundee Canal and Passaic River. Bedrock was not encountered during excavation activities, which extended to 4 feet bgs.

The overburden encountered during the Task III soil borings was consistent with that found in the Task II excavations. The borings, which extended to 10 to 12 feet bgs, did not encounter groundwater or bedrock.

According to the National FIRM, published by the U.S. Department of Housing and Urban Development, this site is not located within an area prone to flooding. Also, as indicated in the NJDOT *Ecology Technical Environmental Study* (1987), wetlands are not present within the property boundaries.

3.11.4 Description of AECs

3.11.4.1 Previously Identified AECs (Task II)

The Task II investigation focused on two areas of environmental concern: a mound of fill material located on the eastern half of the site and miscellaneous debris along the tree line which runs parallel to the Dundee Canal.

The mound of fill material, which has been removed, encompassed approximately 3,000 square feet and extended 15 to 20 feet in height. The material was reportedly stockpiled on the site following excavation activities for the reconstruction of the Ackerman Avenue Bridge. Two test pits were excavated in the large fill mound to the natural soil interface. Stained soil was observed from 2 to 6 feet above natural grade within the mound. One soil sample was collected from each pit at the most highly stained area. A petroleum hydrocarbon odor was noted during excavation of the stained soils. Although the fill mound has been removed since the Task II investigation, the natural soil existing in the former location of the mound may have been

impacted from percolation of stormwater through the mound; therefore, this location remains an area of concern.

Various debris such as wood, concrete, and scrap metal was located along the tree line which parallels Dundee Canal. Three evenly spaced test pits were excavated along the tree line to approximately 4 feet bgs. Natural soil was noted from the ground surface to the bottom of the excavation at these three locations. One sample was collected from each test pit from 0 to 24 inches bgs. All samples submitted for analysis were analyzed for PP+40 and TPH.

The analytical results of the samples collected are provided in Table 3-20. Only those compounds detected are listed in this table. Sample collection depths and comparisons to the NJDEP soil cleanup criteria are also provided. Sample locations are provided in Figure 3-13.

SVOCs, PPM, PCBs, phenol, and pesticide compounds were detected in both samples collected from the mound of fill material. Sample 12-TP1-001 (2.0 mg/kg) and sample 12-TP1-002 (2.2 mg/kg) both contained concentrations of benzo(a)pyrene exceeding the soil cleanup criteria of 0.66 mg/kg. Sample 12-TP1-002 also had 0.68 mg/kg of dibenzo(a,h)anthracene, over the soil cleanup criteria of 0.66 mg/kg. All other compounds (including the remaining SVOCs) were either not detected or were detected at concentrations below the applicable soil cleanup criteria.

The concentrations of all the compounds detected in the three soil samples obtained from the test pits along the tree line were below the NJDEP soil cleanup criteria.

3.11.4.2 Additionally Identified AECs

Additional AECs were not identified during the review of the historical Sanborn maps and aerial photographs for this site.

3.11.5 Implementation of the Remedial Investigation

RI activities at Site 12 were designed to address the soil beneath the former location of the mounded soil. Two borings were located in the area of the mound as shown on Figure 3-13.

Boring Nos. 12-SB2-01 and 12-SB2-02 were installed to depths of 12 feet and 10 feet bgs, respectively. The borings were advanced using hollow-stem auger and continuous split-spoon sampling. Groundwater and bedrock were not encountered within the depths drilled.

Two soil samples were collected from each boring. One sample was collected from 0 to 6 inches bgs to identify contamination in surficial soils. A second sample was to be collected from the interval exhibiting the highest level of contamination. Split-spoon samples were field screened using an HNu PID and visual observations (staining, free product, etc.). Since no evidence of contamination was found using the specified field screening, and groundwater was not encountered, the soil samples were collected from the bottom of each boring.

Soil samples collected from each boring were analyzed for base neutral, acid extractable compounds with a library search (BN+15). Table 3-21 in Appendix C provides a summary of the analytical results. Only those compounds detected are listed in this table. Sample collection depths and comparison to NJDEP soil cleanup criteria are also provided.

3.11.6 Results of the Remedial Investigation

As shown in Table 3-21 the surface soil samples from Borings 12-SB2-01 and 12-SB2-02 exceeded the NRDC soil cleanup criterion for benzo(a)pyrene. The surface soil sample from Boring 12-SB2-01 also exceeded the NRDC soil cleanup criterion for dibenzo(a,h)anthracene. The NRDC soil cleanup criterion for benzo(a)pyrene was also exceeded in sample 12-SB2-01B (9.5- to 10-ft bgs).

Surface soil samples also exceeded the RDC soil cleanup criteria for benzo(a)anthracene (0.9 mg/kg), benzo(b)flouranthene (0.9 mg/kg), benzo(k)flouranthene (0.9 mg/kg), benzo(a)pyrene (0.66 mg/kg), and indeno(1,2,3-cd)pyrene (0.9 mg/kg). Sample No. 12-SB2-01A also exceeded the RDC soil cleanup criteria for dibenzo(a,h)anthracene (0.66 mg/kg).

The bottom sample collected from Boring No. 12-SB2-01 exceeded the RDC soil cleanup criteria for benzo(a)anthracene and benzo(a)pyrene.

All other parameters were either below detection limits for the respective analytical method, or were present at concentrations below the NRDC, RDC, and IGW soil cleanup criteria.

3.11.7 Nature and Extent of Contamination

Based on the analytical results, compounds identified in the soil mound area were also present in the soils beneath the mound's former location. As similar compounds were not encountered in test pit samples collected at other locations on the site, during Task II, it is likely that the former mound was the source.

In Boring No. 12-SB2-002 contamination was encountered in the surface sample (0 - 0.5 feet bgs). No evidence of contamination was noted in the deep sample (9.5 to 10 ft bgs). Benzo(a)pyrene was detected in both the surface soil sample and deep sample collected from Boring 12-SB2-01. However, the concentration decreased significantly with depth (from 4.2 mg/kg to 0.86 mg/kg. The horizontal extent of contamination was not determined, but is considered to be limited to the area formerly occupied by the soil mound.

Due to the limited extent and concentration of the contaminants and the intended use for the property, no further action is anticipated at Site 12. WESTON recommends the implementation of a DER including the use of engineering control such as placing fill and covering the area with the planned freeway extension.

3.12 SITE 13 - DUNDEE WATER AND POWER COMPANY, BLOCK 3.14/LOT 9

3.12.1 Property Description

Block 3.14, Lot 9 (Site 13) is located on Randolph Avenue in Clifton, New Jersey. The property is owned by the Dundee Water and Power Company and encompasses approximately 1.5 acres. The lot is wooded with the exception of a small concrete pad and dirt access road leading to the Dundee Dam. A fence separates the eastern and western portions of the property.

The site is situated within a mixed residential and commercial community. Several commercial businesses and residential properties are located south of the site opposite Randolph Avenue. Vacant land abuts the site to the southeast and west. The Dundee Canal (Site 11) is located northeast of the site.

3.12.2 Site History

The site was occupied from approximately 1935 to 1970 by residential housing. During the period from 1970 to 1974 the houses on the property were demolished. The site has been vacant since approximately 1974.

The following chronological history of the site was compiled from a review of historical aerial photographs and Sanborn maps.

- 1935 - Sanborn Map

  The property was primarily residential in 1935. There were two houses, a greenhouse, and some small sheds located on the site. The surrounding area was moderately developed. South of the site were residential properties, to the west were residential and commercial properties, to the northeast was the Dundee Canal and to the southwest was an auto repair shop.

- 1940 - Aerial Photograph

  Significant changes had not occurred since 1935.

- 1951 - Sanborn Map

  The 1951 Sanborn map indicated no change in site usage from 1935. However, the previously undeveloped land bordering the property to the northwest had been developed into residential properties. Residential development had also occurred south of the site. West of the site, opposite Randolph Avenue, a restaurant and an automobile sales business had been constructed.

- 1951 - Aerial Photograph

Residential development to the northwest and south was visible, which is consistent with the 1951 Sanborn map.

- 1952 - Sanborn Map

The site remained unchanged since the 1951 Sanborn map.

- 1961 - Aerial Photograph

The area within the site remained virtually unchanged. However, the surrounding area was slightly more developed.

- 1965 - Sanborn Map

The site remained residential. The auto sales and services facility located to the west of the site had changed operations and was identified as an "Electric Works".

- 1970 - Sanborn Map

Significant changes within the site or surrounding area had not occurred since 1965.

- 1974 - Aerial Photograph

A house in the southwestern corner of the property had been removed. Opposite Randolph Avenue, several business had been removed and to the northwest several houses had been removed.

- 1984 - Sanborn Map

All buildings formerly located on the property had been removed.

3.12.3 Environmental Setting

WESTON and NJDOT representatives conducted a site inspection of this property in 1991. At the time of the inspection the lot was wooded, with the exception of a small concrete pad and dirt access road leading to the Dundee Dam. Site topography slopes northeast towards the Dundee Canal and most of the surface water runoff generated during storm events appears to flow northeast toward the canal.

Surface soils encountered during sampling activities conducted during the Task II investigation were comprised of a sandy silt with traces of gravel. Sampling activities during the Task III Investigation were hindered by the presence of frequent cobbles and small boulders deeper than 0.5 feet from the ground surface. Groundwater was not encountered during sampling at this site, but based on hydrogeological information collected from locations surrounding the site, the water table is expected to be less than 20 feet bgs. Groundwater flow direction is unknown at present. General topographic features indicate that groundwater may flow toward the Dundee Canal and Passaic River. Bedrock was not encountered during boring activities conducted on site, which extended to 2 feet bgs. However, bedrock was initially encountered at 25 feet bgs within borings installed in the immediate area of the site as part of the Route 21 Geotechnical Investigation.

According to the USGS Maps of Flood Prone Areas, this site is not located within an area prone to flooding. However, according to the National FIRM, published by the U.S. Department of Housing and Urban Development, approximately 30 percent of this site is located within 100-year floodplain and 10 percent of the site is located within the 500-year floodplain. Also, as indicated in the NJDOT *Ecology Technical Environmental Study* (1987), wetlands are not present within the property boundaries.

3.12.4 Description of AECs

3.12.4.1 Previously Identified AECs (Task II)

The Task II investigation focused on two areas of environmental concern: two 55-gallon drums and a roll-off container located in the southwestern portion of the property. Two surface soil samples (13-SS1-001, 002) were collected at a depth of 0 to 24 inches bgs immediately adjacent to the 55-gallon drums to assess whether leakage had occurred. Two surface soil samples (13-SS1-003, 004) were also collected immediately downgradient of the roll-off storage container. These samples were collected to identify the presence of contaminants resulting from spillage or leakage of potentially hazardous materials stored in the roll-off container. All samples submitted for analysis were analyzed for PP+40 and TPHs.

The analytical results of the samples collected are provided in Table 3-22. Only those compounds detected are listed in this table. Sample collection depths and comparisons to the NJDEP soil cleanup criteria are also provided. Sample locations are provided in Figure 3-14.

SVOCs, PPMs, and phenols were detected in the two samples collected immediately adjacent to the 55-gallon drums. However, only two SVOCs were detected at concentrations exceeding the soil cleanup criteria. Sample 13-SS1-001, collected adjacent to the drums, contained benzo(k)fluoranthene (4.4 mg/kg) and benzo(a)pyrene (1.6 mg/kg) at concentrations above their soil cleanup criteria of 4.0 mg/kg and 0.66 mg/kg, respectively. Sample 13-SS1-002, also collected adjacent to the drums, contained 1.8 mg/kg of benzo(a)pyrene, exceeding the soil

cleanup criterion of 0.66 mg/kg. All other compounds detected in these two samples had concentrations lower than the soil cleanup criteria.

SVOCs, PPMs, and phenol were also detected in the two samples collected immediately downgradient of the roll-off containers. The concentrations of all compounds detected in the two samples were below the soil cleanup criteria, except for several SVOC compounds. As shown on Table 3-13, sample 13-SS1-003 contained five SVOCs exceeding the soil cleanup criteria, and sample 13-SS1-004 had six SVOCs exceeding the criteria.

3.12.4.2 Additionally Identified AECs

Additional AECs were not identified on this site during the review of historical Sanborn maps and aerial photographs.

3.12.5 Implementation of the Remedial Investigation

RI activities at Site 13 were designed to address SVOCs identified adjacent to two 55-gallon drums and a roll-off container located in the southwestern portion of the property. The roll-off container was not present at the site during the RI soil sampling activities. The Work Plan proposed that 12 soil borings would be advanced and 24 soil samples would be collected, two soil samples from each boring (0.0 to 0.5 feet bgs and 2.5 to 3.0 feet bgs). Soil borings at Site 13 were advanced using hand augers, with the aid of a pry bar and shovel.

Except for boring 13-SB2-11, only a surface soil sample (0.0 to 0.5 feet bgs) was collected from the 12 soil borings advanced. At boring 13-SB2-011 two soil samples were collected: one from 0.0 to 0.5 feet bgs and one from 1.5 to 2.0 feet bgs. Soil samples were collected only from the surface interval at 11 of the borings because greater than 90 percent of the soil below 0.5 feet consisted of cobbles up to 1.5 feet in diameter. All samples were field screened using an OVA and visual observations. Evidence of contamination was not encountered during the sampling activities at Site 13.

All 13 soil samples collected from Site 13 were analyzed for TPHs and three of the samples (25 percent) with the highest TPH concentrations were analyzed for BN+15. Table 3-23 in Appendix C provides a summary of the analytical results. Only those compounds detected are listed in this table. Sample collection depths and comparison to the NJDEP soil cleanup criteria are also provided.

During the RI sampling activities the two drums located adjacent to the fence were examined (adjacent to sample locations 13-SS1-001 and 13-SS1-002). The drums appeared to be intact and partially full, and had labels affixed to them which stated "Texaco" and "Hazardous to Skin and Inhalation Hazard". Additional information was not present on the drums.

3.12.6 Results of the Remedial Investigation

As shown in Table 3-23, TPH concentrations ranged from 55.4 mg/kg (13-SB2-011B) to 602 mg/kg (13-SB2-004A), well below the 10,000 mg/kg TORC cap. Soil samples 13-SB2-004A (602 mg/kg), 13-SB2-008A (426 mg/kg) and 13-SB2-012A (440 mg/kg) were the three samples with the highest concentrations of TPHs and were therefore also analyzed for BN+15.

Sample 13-SB2-004A contained benzo(a)anthracene (7.6 mg/kg), benzo(b)fluoranthene (6.7 mg/kg) and benzo(a)pyrene (4.6 mg/kg) at concentrations exceeding the NJDEP nonresidential direct contact soil cleanup criteria. Sample 13-SB2-008A contained benzo(a)anthracene (15.0 mg/kg), benzo(b)fluoranthene (12.0 mg/kg), benzo(k)fluoranthene (4.9 J mg/kg), benzo(a)pyrene (12.0 mg/kg) and dibenzo(a,h)anthracene (1.6 J mg/kg) at concentrations exceeding the NJDEP nonresidential direct contact soil cleanup criteria. Sample 13-SB2-012A contained benzo(a)pyrene (0.73 mg/kg) at a concentration exceeding the NJDEP nonresidential direct contact soil cleanup criteria. All other base neutral compounds were either not detected or were present at concentrations below the nonresidential and impact to groundwater soil cleanup criteria.

3.12.7 Nature and Extent of Contamination

Based on the analytical results, PAH compounds are present at concentrations exceeding the NJDEP nonresidential soil cleanup criteria in the four historical soil samples and three RI soil samples analyzed for base neutral compounds. The concentrations of all PAH compounds were below the NJDEP impact to groundwater soil cleanup criteria. The seven soil samples analyzed for BN+15 were collected from 0.0 to 0.5 feet bgs. Soil samples could not be collected at deeper intervals due to the local geology. Greater than 90 percent of the soil below 0.5 feet is comprised of cobbles up to 1.5 feet in diameter.

The geology at boring 13-SB2-011 was slightly more sandy and a soil sample was collected from 1.5 to 2.0 feet bgs. TPH concentrations decreased with depth between samples 13-SB2-011A (344 mg/kg) and 13-SB2-011B (55.4 mg/kg) (Table 3-23). Sample 13-SB2-011B was not analyzed for BN+15; however, the trend of decreasing TPH concentrations with depth may indicate that elevated PAH concentrations are only limited to surface soils at Site 13.

The horizontal extent of the elevated PAH compounds detected at Site 13 has not been fully delineated. In the area of the former dumpster, soil samples 13-SS1-003, 13-SS1-004 and 13-SB2-004A have elevated PAH concentrations. In the area of the drums, soil samples 13-SS1-001, 13-SS1-002, 13-SB2-008A and 13-SB2-012 contain elevated PAH concentrations. These seven samples were the only samples analyzed for PAH compounds at Site 13; therefore, the horizontal extent of the PAH compounds at Site 13 cannot be determined.

Based on the local geology at Site 13, the decreasing TPH concentrations in boring 13-SB2-011 and the future use of this site for roadway construction activities, no further sampling is

proposed. The proposed roadway will extend over this area. WESTON recommends implementation of a DER at this site.

3.13 SITE 14 - NJDOT VACANT LOTS, BLOCK 2.07/LOTS 7, 17, 19

3.13.1 Property Description

Block 2.07, Lots 7, 17, and 19 (Site 14) are vacant properties located between Route 46 and Merselis Street in Clifton, New Jersey. The lots are owned by NJDOT and encompass approximately 1.5 acres. A berm or mound of fill material, presumably a result of past Route 46 construction activities, was noted directly adjacent to Route 46. This berm extends the entire length of the three lots.

The site is located within a residential community. Residential properties are present west and north (across Merselis Avenue) of the site. Route 46 abuts the site to the south and east.

3.13.2 Site History

The property is currently vacant and has been since at least 1940. The following section details the history of the site and surrounding properties. This information was obtained from historical aerial photographs and Sanborn maps. A title search will not be conduced for this site.

- 1940 - Aerial Photograph

The site was vacant with residential properties bordering the western side of the site.

- 1951 - Sanborn Map

The site remained vacant and was now bordered by residential property to the west and north across Merselis Avenue. In addition, Route 6 now bordered the site to the south and east.

- 1951 - Aerial Photograph

The 1951 aerial photograph confirms the 1951 Sanborn map by showing that the site was vacant and surrounded by residential properties and Route 6.

- 1952 - Sanborn Map

Information provided by the 1952 Sanborn map indicated no change in property use since the 1951 Sanborn map.

- 1961 - Aerial Photograph

The 1961 aerial photograph indicates no significant changes to the site or surrounding areas since the 1952 Sanborn map.

- 1965 - Sanborn Map

There have been no significant changes within the site or in the surrounding area since 1961.

- 1970 - Sanborn Map

The 1970 Sanborn map indicates no significant changes to the site or surrounding area since the 1965 Sanborn map.

- 1974 - Aerial Photograph

Review of the 1974 aerial photograph does not indicate any changes within the site or surrounding area since 1970.

- 1984 - Sanborn Map

Since 1974, Route 6 had been renamed to Route 46 and East Eleventh Street had been constructed southeast of the site.

3.13.3 Environmental Setting

WESTON and NJDOT representatives conducted a site inspection of this property in 1991. At the time of the inspection, no evidence of tanks, drums, or stained soils were observed. The site is covered with vegetation and is currently unpaved. The site slopes gently from Route 46 to the north towards Merselis Street. Surface drainage from the lots appears to flow in a similar direction, draining onto Merselis Street. Several residential buildings were located adjacent to the site and access to the site is unrestricted.

Test pits were excavated within the berm located adjacent to Route 46 from 0 to 5 feet until natural soils were encountered below the bermed area. Excavated fill material consisted of silt and sand with small amounts of gravel. Depth to groundwater and bedrock was not established during the Task II Investigation; however, bedrock was initially encountered in the area during the Route 21 Geotechnical Investigation at depths of approximately 25 feet bgs in this area. Groundwater flow direction at the site has not been determined. Based on general topographic features, groundwater may flow to the north.

According to the USGS Maps of Flood Prone Areas and the National FIRM, published by the U.S. Department of Housing and Urban Development, this site is not located within an area prone to flooding. Also, as indicated in the NJDOT *Ecology Technical Environmental Study* (1987), wetlands are not present within the property boundaries.

3.13.4 Description of AECs

3.13.4.1 Previously Identified AECs (Task II)

The Task II investigation focused on one area of environmental concern, a berm located along Route 46. Four test pits were excavated to "natural" grade at 100-foot intervals along the berm. Four samples were collected at the interface between the fill material and the "natural" soil to determine the presence of contamination resulting from the fill material in the berm. All samples submitted for analysis were analyzed for PP+40 and TPHs.

The analytical results of the samples collected are provided in Table 3-22. Only those compounds detected are listed in this table. Sample collection depths and comparisons to the NJDEP soil cleanup criteria are also provided. Although samples were collected from 2.5 to 5.0 feet below grade within the fill material, results for test pits samples were compared to surface soil standards. This approach is based on the conservative assumption that the samples collected below grade are characteristic of fill material in the berm from 0 to 2 feet below grade. Sample locations are provided in Figure 3-12.

SVOCs and PPMs were detected in all of the samples collected. Phenol was detected in two of the samples and 4,4'-DDT was detected in one of the samples. The concentrations of all of the compounds detected were below the NJDEP soil cleanup criteria, except for lead in sample 14-TP1-003. Soil sample 14-TP1-003 contained 750 mg/kg of lead, exceeding the soil cleanup criteria of 600 mg/kg. The average lead concentration for the four soil samples collected from the berm was 278 mg/kg. Since the average concentration for the samples collected from the berm area is below the soil cleanup criteria, it appears that the slightly elevated lead concentration in sample 14-TP1-003 may not be indicative of the soil contained within the berm. In addition, the roadway extension will be constructed over this parcel of land. Therefore, no further action was proposed for this AEC, as per the approved Work Plan.

3.14 SITE 25 - JEAN RIBBON MILLS, BLOCK 55/LOT 14

3.14.1 Property Description

Block 55, Lot 14 (Site 25) is located at One Mattimore Street in Passaic, New Jersey. The property, owned by Harris, is operated as a ribbon mill under the name Jean Ribbon Mills, Inc. The site consists of a 25,000-square-foot manufacturing building and a parking lot located adjacent to the canal. The facility operates under two SIC codes: #2241, designated as an establishment primarily engaged in weaving or braiding narrow fabrics of cotton, wool, silk, and

manmade fibers, including glass fibers; and #2269, designated as an establishment primarily engaged in dyeing and finishing textiles, not elsewhere classified, such as bleaching, dyeing, printing, and finishing of raw stock, yarn, braided goods, and narrow fabrics, except wool and knit fabrics. The property encompasses approximately 1.25 acres. This site is a large-quantity generator of hazardous waste under the USEPA's RCRA Program and is identified by USEPA identification number NJD002161909. The NJDOT will be purchasing the eastern edge of the site for construction of the freeway.

Representatives of WESTON and NJDOT conducted a brief site inspection during the Task II investigation. The only AEC identified during the inspection was a UST which is identified by the New Jersey Bureau of Underground Storage Tanks (BUST) as containing heating oil. This UST is not located within the portion of the property to be purchased by NJDOT.

The site is situated within a mixed residential, commercial, and industrial community. Mattimore Street and Hobart Street abut the site to the north and south, respectively. The Dundee Canal bounds the site to the east and commercial businesses to the west. Residential properties, and beyond them the Passaic Industrial Park, are located north of the site across Mattimore Street. Site 24, owned by the NJDOT, and commercial businesses are located south of the site across Hobart Street.

3.14.2 Site History

The following section details the history of the site and surrounding properties. This information was obtained from title searches and a review of historical aerial photographs and Sanborn maps.

The site was used for residential and commercial purposes from 1894 to 1910. Between 1910 and 1935 the buildings were removed and the site remained vacant until after 1940. Between 1940 and 1951 a plastics manufacturing facility was constructed. Additional buildings were constructed sometime between 1961 and 1974. The site has remained relatively unchanged since 1974.

Title searches disclosed the following ownership history:

- Botany Worsted Mills sold the property to Rose C. Harris and Bertha Harris on 1 December 1944.
- Bertha Harris and Jesse (her husband), sold the property to Rose C. Harris and Milton (her husband) on 26 February 1957.
- Milton Harris and Rose C. (his wife) sold the property to Milton Harris, as Trustee of an Inter Vivos Trust dated 1 March 1954 on 15 December 1972.

- Rose C. Harris and Milton (her husband) sold a portion of the property to the State of New Jersey on 25 February 1974.

- Milton Harris, Trustee under Inter Vivos Trust Agreement dated 1 March 1954, sold the property to Alan S. Harris and Judith Harris Krawitz on 7 January 1974.

- Milton Harris and Rose C. (his wife), Judith Harris Krawitz and George (her husband) and Alan S. Harris and Harriette (his wife), formed a partnership on 7 December 1979.

The following chronological history of the site was compiled from the title search and through a review of aerial photographs and Sanborn maps.

- 1894 - Sanborn Map

Based on the information provided from the 1894 Sanborn map, the property consisted of vacant land, residential properties and commercial facilities in 1894.

The site was bordered to the southeast by the Dundee Canal. Residential properties were present across Mattimore, Hobart and Dayton Streets.

- 1899 - Sanborn Map

There were no significant changes within the site or surrounding area between 1894 and 1899.

- 1903 - Sanborn Map

This map indicates no change in site usage between 1899 and 1903.

- 1910 - Sanborn Map

A portion of the site was vacant land and the remaining portion of the site was used for residential housing. There were no changes indicated by the 1910 Sanborn map in the surrounding areas between 1894 and 1910.

- 1935 - Sanborn Map

The 1935 Sanborn map indicates that the buildings previously located on site had been removed and that the site was vacant.

There were no significant changes in the surrounding area between 1910 and 1935.

- 1940 - Aerial Photograph

The 1940 aerial photograph indicates that the land was vacant, which is consistent with the 1935 Sanborn map. An area of potential soil disturbance or debris was located in the center of the property.

A large industrial complex was located approximately 200 feet north of the site, beyond residential properties. The canal bordered the site to the south and east, and residential and commercial properties bordered the site to the west.

- 1951 - Sanborn Map

The 1951 Sanborn map indicates that development had occurred within the site since 1940. A "plastic molding" facility had been constructed on the property and a fuel oil tank was identified on site. There were no other significant changes indicated by the map within the site or surrounding area between 1935 and 1951.

- 1951 - Aerial Photograph

A building had been constructed on the property since 1940, which was identified as a "plastic molding" facility in the 1951 Sanborn map. The remainder of the site and the surrounding areas had not significantly changed since 1940.

- 1961 - Aerial Photograph

Minor changes occurred at the site between 1951 and 1961. The building remained, but vegetation had grown on part of the site and potential debris was stored at the south and northeastern corners of the site.

There were no significant changes indicated by the 1961 aerial photograph to the surrounding areas since the 1951 aerial photograph.

- 1974 - Aerial Photograph

The 1974 aerial photograph indicates that two additional buildings had been constructed immediately adjacent to the building first noted on the 1951 aerial photograph. Vehicles were parked at the northern corner of the site and potential debris was visible adjacent to the vehicles.

There were no significant changes to the surrounding areas as compared to the 1961 aerial photograph.

- 1979 - Sanborn Map

The only significant change within the site or surrounding areas as compared to the 1951 Sanborn map was the construction of the additional buildings, which is consistent with the 1974 aerial photograph.

- 1991 - Sanborn Map

Information provided by the 1991 Sanborn map indicated no change in site usage since 1979.

3.14.3 Environmental Setting

WESTON and NJDOT representatives conducted a brief site inspection of this property in 1991. At the time of inspection, a UST was identified adjacent to the southern building wall. The site gently slopes to the east towards the Dundee Canal. Surface drainage from the site appears to flow in a similar direction.

There was no investigation initiated at this facility during the Task II effort. Since no subsurface investigation was conducted on this property, depth to groundwater and bedrock is unknown. However, based on general topographic features, groundwater may flow towards the Dundee Canal and Passaic River.

According to the USGS Maps of Flood Prone Areas and the National FIRM, published by the U.S. Department of Housing and Urban Development, this site is not located within an area prone to flooding. Also, as indicated in the NJDOT *Ecology Technical Environmental Study* (1987), wetlands are not present within the property boundaries. However, the report indicated that the portion of the Dundee Canal immediately adjacent to the site was considered wetlands.

3.14.4 Description of AECs

3.14.4.1 Previously Identified AECs (Task II)

The Task II investigation identified one potential area of environmental concern at this site: a UST.

3.14.4.2 Additionally Identified AECs

An additional AEC was identified during the review of historical Sanborn maps and aerial photographs. A fuel oil tank was identified on-site in the 1951 Sanborn map. The size and exact location of the tank were not specified, but the map indicated that it was located on the western side of the building. Information pertaining to the disposition of the tank was not available during the historical records review.

Since the fuel oil tank was historically located on the western side of the building, away from the property that would be impacted by the NJDOT right-of-way, sampling was not warranted. However, soil sampling was proposed east of the site to determine whether historical activities or releases from the UST have impacted the subsurface.

3.14.5 Implementation of the Remedial Investigation

RI activities at Site 25 were initially located east of the property along the side slope of the Dundee Canal. Due to the inaccessible conditions presented by the slope, the boring locations were moved to the top of the embankment and within the perimeter fence of Site 25. Boring locations are presented in Figure 3-16.

A total of six soil borings were installed from 0 to 10 feet bgs utilizing hollow-stem augers and continuous split-spoon sampling. Groundwater and bedrock were not encountered within the depth drilled. Two soil samples were collected from each boring. One sample was collected from 0 to 6 inches bgs to identify contamination in surficial soils. A second sample was collected from the interval exhibiting the highest level of contamination. Split-spoon samples were field screened using an HNu PID and visual observations (staining, free product, etc.). Soil samples collected from each boring were analyzed for TCL+30 and TAL inorganics. Table 3-25 in Appendix C provides a summary of the analytical results. Only those compounds detected are listed in this table. Sample collection depths and comparison to NJDEP soil cleanup criteria are also provided.

3.14.6 Results of the Remedial Investigation

As shown in Table 3-25 the surface soil samples from Borings 25-SB2-003 and 25-SB2-005 exceeded the NRDC soil cleanup criteria for benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and dibenzo(a,h)anthracene. The surface soil sample from Boring 25-SB2-005 exceeded the NRDC soil cleanup criteria for benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene.

The TAL metals beryllium and thallium were detected in the surface soil sample of Boring 25-SB2-001, above NRDC soil cleanup criteria.

The RDC soil cleanup criteria for some or all of the SVOCs benzo(a)anthracene (0.9 mg/kg), benzo(b)flouranthene (0.9 mg/kg), benzo(k)flouranthene (0.9 mg/kg), benzo(a)pyrene (0.9 mg/kg), indeno(1,2,3-cd)pyrene (0.9 mg/kg), dibenzo(a,h)anthracene (0.66 mg/kg), and chrysene (9.0 mg/kg) were exceeded in surface sample Nos. 25-SB2-03A, 25-SB2-04A, and 25-SB2-05A.

The RDC soil cleanup criteria for the TAL inorganics arsenic (20 mg/kg), beryllium (1.0 mg/kg), cadmium (1.0 mg/kg), lead (400 mg/kg), thallium (2 mg/kg), and vanadium (370 mg/kg) were exceeded in one or more of surface soil samples 25-SB2-01A, 25-SB2-02A, 25-

SB2-03A and 25-SB1-04A. The vanadium concentration in sample 25-SB1-01B also exceeded the RDC soil cleanup criteria.

All other parameters were either below detection limits for the respective analytical method, or were present at concentrations below the NRDC, RDC and IGW soil cleanup criteria.

3.14.7 Nature and Extent of Contamination

The presence of these compounds and analytes appears to be sporadic and not associated with a point source or specific area of environmental concern (i.e., USTs).

Based on the fact that the presence of the above-mentioned compounds and analytes is sporadic and on the intended use for the property, no further action is anticipated at Site 25. NJDOT anticipates the need for a DER at the site, with the construction of the freeway providing engineering controls (i.e., fill placement, capping).

WESTON

SECTION 4.0

CONCLUSIONS AND RECOMMENDATIONS

Based on the results obtained from the environmental investigations conducted for the 4M/6J sites, 3 of the 14 sites, Sites 1 and 3, will require the preparation of a Remedial Action Work Plan. No further action is proposed for the remaining 12 sites. A summary of each site is provided below.

Site 1 and Site 3 - Parkstein Company

Based on the level of contaminants present in the upper 2 to 3 feet of soils, potentially at hazardous waste levels, remedial action will be required at this site. WESTON recommends the preparation of a Remedial Action Work Plan and implementation of the NJDEP-approved remedial action. Since this site is not currently owned by the NJDOT, the site owner should proceed with these activities. In addition, site activities should be modified so that the subsurface is not adversely impacted in the future.

Site 2, 9, 11 - Dundee Canal

Since contaminants of concern (PPMs, SVOCs) are present above applicable sediment quality criteria to depths as great as 10 feet bgs, WESTON recommends that the design of the proposed freeway limit, to the extent possible, the need to excavate these sediments. Although contaminants are not present at hazardous waste concentrations, disposal of the sediments as clean fill is not possible. The sediments would most likely be classified as industrial I.D. #27 waste, which will limit the methods of disposal to landfilling, recycling or possibly reuse under the freeway. Since the sediment may not fit NJDOT specifications for embankment material, landfilling and/or recycling are likely. Of concern is the presence of dioxin and associated disposal restrictions that are applied to this parameter.

No further sampling is proposed within the canal, unless required for waste classification purposes prior to sediment removal. Construction design must be finalized prior to this additional sampling.

Site 5 - NJDOT Vacant Lots

No sampling has been performed at this site; however, staining was noted during the Task II investigation. Stained areas sampled during Task II were actually located on adjacent Site 6. Since the results of the recent RI inspection did not identify any areas of concern (i.e., staining, debris, etc.), no further action is proposed for this site. It is important to note that the proposed freeway will extend over much of this site and fill material will be imported.

Site 6 - Conrail Railroad

Sampling of stained soils and fill mounds on this vacant lot during the Task II investigation identified SVOCs in excess of NJDEP soil cleanup criteria. Since this staining was not present during the most recent RI inspection and no additional fill mounds/debris were observed, no sampling was conducted during the RI. Since the proposed freeway will be constructed directly over this area, including the importation of fill, WESTON recommends the implementation of a DER for this site versus remediation.

Site 7 - Chelton Realty Company/McLean Industrial Complex

One sample collected from a stained area during the Task II investigation identified benzo(a)pyrene at a concentration above NJDEP soil cleanup criteria. A site inspection performed during the RI confirmed that this stain, which encompassed approximately 8 square feet, had been covered with gravel and paved. Since this area lies outside of the area to be acquired by NJDOT for construction of the freeway and it has been paved as part of normal site operations, no further action on behalf of NJDOT is recommended.

Site 10 - NJDOT/SBH Realty Association

Since the RI GPR survey and subsequent excavation activities confirmed the absence of USTs at this site and since the Task II sampling did not identify compounds in excess of soil cleanup criteria, no further action is recommended for this site.

Site 12 - NJDOT Vacant Lots

The Task II and RI sampling results indicate that the leaching of SVOCs from a former soil mound located at this site had impacted soils at the site. Due to the limited extent of the affected soils, and the fact that the proposed freeway will be located directly over this location and would include the importation of fill material, no further action is proposed. WESTON recommends the implementation of a DER for the site versus remediation.

Site 13 - Dundee Water and Power Company

PAH compounds have been detected above NJDEP soil cleanup criteria at locations adjacent to two 55-gallon drums and a former roll-off container. Since soils at the site are limited to the upper 1 to 2 feet, below which boulders are present, no further action is recommended for this site. WESTON recommends the implementation of a DER for this site versus remediation. The current site owners should arrange for disposal of the drums in accordance with local, state and federal regulations.

Site 14 - NJDOT Vacant Lots

As per the approved Work Plan, no further action was required as part of the RI at this site. The Task II sampling did not identify contaminants of concern in excess of NJDEP soil cleanup criteria, with the exception of lead. The presence of lead may warrant the implementation of a DER.

Site 25 - Jean Ribbon Mill

SVOCs and PPMs collected from soils at the site were in excess of NJDEP soil cleanup criteria. This contamination is sporadic in nature and does not appear to be associated with historical site use. Since this area will be overlain by the freeway, no further action is recommended at this site. WESTON does recommend the implementation of a DER versus remediation.