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EPA Superfund
Record of Decision:

VEGA BAJA SOLID WASTE DISPOSAL
EPA ID: PRD980512669
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RIO ABAJO WARD, PR
04/06/2004

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
NEW YORK, NEW YORK

RECORD OF DECISION

VEGA BAJA SOLID WASTE DISPOSAL SITE
VEGA BAJA, PUERTO RICO OPERABLE
UNIT 1 - GROUNDWATER

APRIL 2004

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Vega Baja Solid Waste Disposal Site
Operable Unit 1- Groundwater
Vega Baja, Puerto Rico

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Vega Baja Solid Waste Disposal Site, Operable Unit 1 - Groundwater (the "Site"), located in the Municipality of Vega Baja, Puerto Rico, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, ("CERCLA"), 42 U.S.C. §§ 9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 CFR Part 300. This decision document explains the factual and legal basis for selecting the remedy for the Site. The information supporting this remedial action decision is contained in the administrative record for the Site. The attached index (Appendix I) identifies the items that comprise the Administrative Record upon which the selection of the remedy is based.

The Puerto Rico Environmental Quality Board ("EQB") was consulted on the planned remedy, in accordance with CERCLA Section 121 (f), 42 U.S.C. § 9621 (f), and it concurs with the selected remedy (Appendix II).

DESCRIPTION OF THE SELECTED REMEDY - NO ACTION

This selected remedy addresses the fate and transport of the contaminants in the groundwater emanating from the Site. The United States Environmental Protection Agency ("EPA"), in consultation with EQB, has determined that Site-related groundwater contamination is limited and does not pose a significant threat to human health or the environment; therefore, remediation is not necessary. This determination is based on the conclusions of the Remedial Investigation ("RI") report, which indicated that groundwater, and spring water at the Site are largely free of contaminants that can be attributed to Site-related activities.

DECLARATION

In accordance with the requirements of CERCLA, and the NCP, EPA, in consultation with EQB, has determined that no remedial action is necessary to protect, human health or the environment from exposure to groundwater at the Site. Groundwater does not pose a significant threat to human health or the environment. Because no hazardous substances remain in the groundwater above health-based levels, a five-year review is not required.

George Pavlou, Director
EPA Region 2
Emergency and Remedial Response Division

4-6-04
Date

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
NEW YORK, NEW YORK

DECISION SUMMARY

RECORD OF DECISION
VEGA BAJA SOLID WASTE DISPOSAL SITE
VEGA BAJA, PUERTO RICO
OPERABLE UNIT 1 - GROUNDWATER

TABLE OF CONTENTS

SITE NAME, LOCATION AND DESCRIPTION

The Vega Baja Solid Waste Disposal Superfund Site (Site) contains approximately 72 acres and includes an unlined and uncapped solid waste disposal and open burning area. It is located in the Rio Abajo Ward of Vega Baja, Puerto Rico, approximately 1.2 miles south of the Vega Baja downtown area (Appendix III, Figure 1). The Site includes a 55-acre residential area currently known as "Brisas del Rosario" which contains an estimate of 213 dwellings and a 17-acre undeveloped, uninhabited area. The Site is situated on relatively flat terrain and it. is surrounded by other residential areas to the north, east and west and is bordered to the south by conical limestone hills, known as "mogotes" (Appendix III, Figure 2).

The Rio Abajo Head Start is the nearest school and is located next to a baseball park approximately 0.21 mile from the Site. According to the Puerto Rico Environmental Quality Board's (EQB's) Expanded Site Investigation (ESI), the population within a four-mile radius of the Site is more than 40,000. The population within a one mile radius of the Site is approximately 6,871 and 2,280 within one-quarter mile.

SITE HISTORY AND TIME-CRITICAL REMOVAL ACTION

Between approximately 1948 to 1979, the municipality of Vega Baja used the Site as an unlined solid waste disposal and open burning facility that received commercial, industrial, and domestic waste. It is estimated that more than 1.1 million cubic yards of waste were disposed of and/or burned at the facility. At the time of disposal and burning activities, the Site was owned by the Puerto Rico Land Authority (PRLA).

During the late 1970s, EQB in response to complaints of neighboring residents, conducted several inspections at the active waste disposal facility. As a result of these inspections, EQB cited the Municipality of Vega Baja for ineffective environmental and management control of the Site's daily operations.

The waste disposal operations at the Site were discontinued in 1979, when the Municipality of Vega Baja opened a new landfill at Cibuco Ward, Vega Baja.

Local residents began constructing homes on portions of the uncapped waste disposal area beginning in the late 1970s. Many houses at the Site are built on and around the landfill trash with some piles (mounds) having elevations of over eight feet. In 1984, the PRLA transferred the Site property to the Puerto Rico Housing Department (PRHD). The PRHD is believed to be the current owner of the 17 undeveloped acres within the Site and of certain parcels within the residential area of the Site. The PRHD has transferred title to some of the parcels within the Site, but it is unclear, at this time, which residents have deeds to the properties.

Beginning in 1994, EQB and EPA conducted the following investigations at the Site.

Site Inspection. May 1994. In May of 1994, EQB conducted a Site Inspection (SI) at the Site. During the SI, five surface soil samples, one background soil sample, five sediment samples, and two groundwater samples (from one upgradient and one downgradient well) were collected.

The surface soil samples were collected from the backyards of five residential properties that were located on the former waste disposal area at the Site. Analytical results indicated lead concentrations up to 3,410 parts per million (ppm), and copper concentrations up to 350 ppm, in the soil samples. Organics detected above background levels included bis(2-ethyhexyl) phthalate, fluoranthene, pyrene, and Aroclor 1260.

Sediment samples were collected from two locations along the Site's drainage ditch and from three locations along the Rio Indio: one upstream of the Site; one at the drainage ditch's probable point of entry; and one downstream of the Site. Acetone, 2-butanone, tetrachloroethene, and copper were detected at concentrations above background in the sediment samples.

Groundwater samples were collected from the upgradient Villa Pinares municipal well and from a downgradient Vega Baja municipal well, which is located approximately 0.9 mile north of the Site. Copper was detected in the downgradient well sample at 34 parts per billion (ppb). Analysis of the data indicate that the detected copper concentration in the public supply well did not represent a health threat to the community.

Expanded Site Inspection, August 1996. An ESI was conducted from June through August 1996 by EQB and EPA's Superfund Technical Assistance and Response Team (START). As part of the ESI, a limited number of samples from groundwater, surface water, sediment, and surface soil was collected to better characterize the extent of contamination within the waste disposal area at the Site and to determine if the Site represented a potential threat to human health. Data were also collected to provide information for an Agency for Toxic Substances and Disease Registry (ATSDR) health consultation.

The surface soil samples collected from residential properties were screened for lead with an X-Ray Fluorescence (XRF) instrument. The results of the XRF screening activities were used to determine sampling points for confirmatory laboratory analysis. A total of 153 soil samples were subsequently collected from locations throughout the former waste disposal area at the Site and submitted to an EPA Contract Laboratory Program (CLP) laboratory for Target Compound List (TCL) and Target Analyte List (TAL) analysis. Copper, lead, cadmium, nickel, and several other inorganics were detected at concentrations above background. Organic compounds detected above background or the Contract Required Detection Limit (CRDL) included pyrene, benzo(a) pyrene, fluoranthene, phenanthrene, methoxychlor, and Aroclor 1254.

Six sediment and five surface water samples were collected from locations along the Site's drainage ditch and from upstream and downstream locations of the Rio Indio. The samples were submitted to CLP laboratories for TCL and TAL analysis. Analytical results indicated the presence of chromium, copper, lead, nickel, zinc, and several other inorganics in the sediment

samples. No organic compounds, however, were detected in the sediment samples. In addition, no organic compounds or inorganic analytes were detected in the surface water samples.

Groundwater samples were collected from two public supply wells; one upgradient of the Site and one downgradient. No inorganic or organic chemicals were detected in either of the supply wells.

Based on a review of the ESI soil analytical results, ATSDR determined that the Site could be a public health hazard since long-term exposure to lead concentrations, detected in the soil at many properties, could have harmful effects on children.

Limited Groundwater Study, April -June, 1998. From April to June 1998, EPA START conducted a limited groundwater study at the Site. The study included the installation of monitoring wells and sampling of the newly installed wells and neighboring public supply wells. START installed three water table wells (MW 01, MW 02, and MW 03) that ranged in depth from 195 feet below ground surface (bgs) to 215 feet bgs. MW 01 and MW 02 were installed downgradient of the Site and MW 03 was installed upgradient. Public supply wells that were sampled included the nearby United States Geological Survey (USGS) observation well (Rosario 2), located 40 feet west of the Site, and from three public supply wells: the upgradient Villa Pinares well and the two downgradient Vega Baja 1 and Vega Baja 3 wells. The samples were submitted to an EPA CLP laboratory for TCL organic compound and TAL inorganic analyte analyses.

Acetone and 1,1,1-trichloroethane were detected in the Rosario No. 2 well at levels up to 54 micrograms per liter (µg/L) and 61 µg/L, respectively. Bis (2-ethylhexyl) phthalate was detected in two of the public supply well samples but was also noted in associated quality control blanks. Estimated concentrations of heptachlor and endrin aldehyde were detected in both up and downgradient wells; the highest levels were detected in MW 01, at concentrations up to 0.019 µg/L and 0.053 µg/L, respectively. No other TCL organic compounds were detected in the groundwater samples.

Iron and manganese were detected in the samples collected from both up and downgradient wells at concentrations above their respective CLP CRDLs; iron was detected at levels up to 2,310 µg/L and manganese was detected at levels up to 144 µg/L. Several other inorganics, including aluminum, arsenic, barium, copper, mercury, and selenium, were detected at estimated concentrations in both up and downgradient wells.

Soil Sampling Event, April - December 1998. EPA conducted a soil sampling event at the Site from April 1998 to December 1998. A total of 3,693 samples were collected and analyzed, primarily for lead. The sampling event was divided into three phases:

Phase I - The sampling was conducted from April 14 to June 8, 1998. The primary contaminant of concern during this phase was lead. However, the samples were also analyzed for the presence of other inorganic and organic compounds. The sampling area consisted of the residential area

south of Route 22 and east of Trio Vegabajeno Avenue, terminating on Progreso Street to the east and included the undeveloped wooded areas to the south. A total of 814 soil samples were collected and analyzed for lead using XRF methodology. Soil samples were also taken from the bottom and side walls of the drainage ditch.

Lead concentrations across the Site ranged up to 14,000 milligrams per kilogram (mg/kg) or ppm. The highest lead concentration found in the residential area was 2,600 mg/kg at 0.5 foot (ft) depth. In the residential area, lead concentrations generally decreased with depth (i.e., at 2 ft depth the lead concentrations were below 400 mg/kg). The area where the highest lead levels were found extends from the undeveloped area to the intersection of Trio Vegabajeno Avenue and Alturas Street.

Soil samples collected from the drainage ditch bottom had very low lead levels (not detectable to 42 mg/kg). However, samples collected from the sides of the ditch had lead levels ranging from 220 mg/kg to 1,100 mg/kg. EPA concluded that lead levels on the drainage ditch sides are similar to lead levels in the soil throughout the Site and are expected to remain constant. However, those on the drain bottom are expected to change continuously with rainfall, soil erosion, and deposition.

Ten percent of the soil samples were sent to the Response Engineering and Analytical Contract (REAC) laboratory in Edison, New Jersey for confirmation of XRF results or for further XRF analyses along with other TAL metals excluding mercury, selenium, and thallium. Unvalidated data showed lead concentrations up to 24,000 mg/kg; copper concentrations up to 24,000 mg/kg; arsenic concentrations up to 190 mg/kg; and chromium concentrations up to 390 mg/kg. Other metals detected included antimony, cadmium, iron, manganese, nickel, and zinc.

The XRF confirmation samples were also analyzed for volatile organic compounds (VOCs), base/neutral acids (BNAs) and pesticides/polychlorinated biphenyls (PCBs). Trace amounts of the following VOCs were found: toluene, xylenes, ethylbenzene, styrene, trichlorofluoro-methane, acetone, and butanone. Traces of BNAs, including bis (2-ethylhexyl) phthalate, butylbenzyl phthalate, di-n-octylphthalate, di-n-butylphthalate, and diethylphthalate, were also found in a number of samples at concentrations up to 92,000 micrograms per kilogram (µg/kg). However, a phthalate compound was also found in a laboratory blank.

A total of 72 soil samples were analyzed for pesticides and PCBs. Dieldrin was the pesticide detected most frequently and with the highest concentrations. Dieldrin was detected in 20 samples at concentrations ranging up to 2,900 µg/kg. Other pesticides detected included dichlorodiphenyltrichloroethene (DDT), chlordane, and heptachlor epoxide. Of the PCBs, weathered Aroclor 1254 was detected in nine samples at concentrations up to 360 µg/kg, Aroclor 1248 was detected in two samples at a maximum concentration of 900 µg/kg, and Aroclor 1260 was detected in two samples at a maximum concentration of 600 µg/kg. The pesticide/PCB detections were found in the southern section of the Site and correlate with the location of the garbage mounds.

Phase II - The sampling was conducted from August 3 to December 3, 1998. The majority of the sampling area consisted of the residential area south of Route 22 and east of Trio Vegabajeno Avenue. The sampling area terminated on Progreso Street to the east and the undeveloped wooded area to the south. No soil sampling was done in the undeveloped wooded area south of the residences.

During this phase each residential lot was sampled as a discrete unit and analysis focused on soil lead content. Two sampling protocols were followed. In properties where elevated lead levels (400 mg/kg or greater) were found during previous sampling activities, biased sampling locations were collected at ground surface, 1.0, and 2.0 feet bgs. In properties where lead levels less than 400 mg/kg were found during previous sampling activities, six surface soil samples were initially collected on a regular grid where feasible. However, later in the sampling event, soil samples were also collected at 1.0 foot bgs. Approximately 213 residential lots were sampled and 2,823 soil samples were collected and analyzed.

During this phase, lead concentrations from XRF analytical methods at the residential area ranged from non detect to 7,100 ppm at one foot bgs. An extensive area in the residential development with high lead concentrations was identified in the southwestern section of the Site. Other areas with pockets of elevated lead concentrations were found in the northeast section of the Site.

Sixty soil samples were sent to a CLP laboratory for lead analysis via the Toxicity Characteristic Leaching Procedure (TCLP) . These samples were split from the XRF samples and were selected after XRF analysis to represent a range of lead concentrations above 400 mg/kg. Lead TCLP concentrations ranged from non detect to 3.34 milligrams per liter (mg/L). However, the 3.34 mg/L concentration appears to be an anomaly, since the next highest TCLP result was 0.65 mg/L. The Resource Conservation and Recovery Act (RCRA) threshold limit for the characteristic of toxicity for lead is 5 mg/L. None of the samples analyzed exceeded the TCLP RCRA threshold limit.

Phase III - This phase was focused on sampling four garbage mounds in the residential area. The sampling was conducted from December 5 to December 16, 1998. The objective of this phase was to estimate the area of the mounds, the thickness of the garbage and the level of lead contamination within the mounds. A total of 56 samples were collected and analyzed using XRF methodology.

During the sampling of the four garbage mounds in the residential area, lead was detected at concentrations up to 2,900 mg/kg. The highest concentrations were found in garbage mound 1 where the garbage was the thickest (over 8 feet). Ten percent of the XRF samples were also analyzed using the inductively coupled argon plasma (ICAP) technique for confirmation of the XRF results.

Hazard Ranking System Evaluation, February 1999. Information, gathered during the EQB and EPA investigations, was used to perform the Site's Hazard Ranking System (HRS) Evaluation.

The HRS score for the Site was based largely on the potential threat of a release of hazardous substances to groundwater. The soil exposure pathway also contributed to the HRS Site score since it evaluated the likelihood that residents and nearby populations would be exposed to contaminated soil associated with sources at the Site. The primary driver for the Vega Baja soil exposure pathway score was the detection of inorganics, including lead and arsenic, at concentrations significantly above background or health-based benchmarks, in residential surface soil samples.

NPL Listing. Based upon the results of the HRS, the Site was proposed for the National Priorities List (NPL) on April 22, 1999 and listed on the NPL July 22, 1999.

Removal Action, 1999. After evaluating the data from Phases I, II, and III, the EPA Removal Program decided to evaluate the areas where the higher lead levels were found in residential lots. As a result of this evaluation, the EPA Removal Program recommended a time-critical removal action at three properties: 5571 Alturas Street, 5569 Alturas Street and 5460 Los Angeles Street (hereinafter, the Three Lots). On August 18, 1999, the Director of EPA Region 2 Emergency and Remedial Response Division signed an action memorandum to conduct a CERCLA time-critical removal action at the Three Lots. The removal action included among other things, excavation and off-Site disposal of contaminated soil and the demolition and reconstruction of one residence which presented an obstruction and construction hazard to excavation activities.

Dioxin Sampling Event, June 2001. Because the Site had historically been used to burn a variety of garbage, in June 2001, an EPA contractor collected surface soil samples for analysis of dioxin. This sampling event was conducted to determine if dioxin is present at the Site in sufficient quantities to be considered a chemical of concern.

A total of 121 soil samples were collected and analyzed. Only one sampling point, located in the wooded area to the south, had dioxin concentrations above the recommended action level of 1 part per billion.

A report was finalized in February 2002 (REAC 2002). The report concluded that the residential and undeveloped areas do not warrant any removal or remedial action for dioxin and that dioxin is not considered as a chemical of concern.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Remedial Investigation (RI) Report and the Proposed Plan for Operable Unit 1 - Groundwater were released for public comment on November 24, 2003. These documents along with the Administrative Record were made available to the public in the EPA Docket Room in Region 2, New York, the Vega Baja Municipal Library, EQB's Superfund File Room and EPA's Caribbean Environmental Protection Division Office. A public notice announcing the availability of these documents and the date of the public meeting was published in the El Vocero and the El Nuevo Pia on December 2, 2003. The 30-day public comment period was set by EPA to end on December 24, 2003.

During the public comment period, EPA held the public meeting to present the RI, the risk assessment and the Proposed Plan, to respond to questions regarding these items, and to receive both oral and written comments. EPA held the public meeting at the Catholic Chapel Rio Indio, located at Principal Street, Brisas del Rosario, Vega Baja, Puerto Rico on December 4, 2003. At this meeting, EPA answered questions about the Site and the proposed no action remedy and received comments from interested persons. Comments and responses to those comments received at the public meeting and during the public comment period are included in the Responsiveness Summary (Appendix IV).

SCOPE AND ROLE OF ACTION

In order to effectively address contamination at the Site, the Site has been divided into two operable units. Operable Unit One (OU-1) is the subject of this Record of Decision and addresses groundwater at the Site. In the Fall of 2001, EPA initiated a groundwater RI for the Site. The RI focused on collecting adequate groundwater data to determine if Site activities had impacted groundwater and, if so, the nature and extent of that contamination. Operable Unit two will address the soils at the Site.

Conclusions of the RI Report indicate that the groundwater and spring water at the Site are largely free of contaminants that can be attributed to Site related activities. Conclusions of the Human Health Risk Assessment indicate that the carcinogenic risks were within EPA's acceptable risk range of 10^{-4} to 10^{-6} for current and future residents and noncarciriogenic hazards for exposures at the Site showed values that were below the EPA's target Hazard Index of 1 for current and future residents.

REMEDIAL INVESTIGATION

The following describes the regional and Site-specific geography, geology, and hydrogeology as presented in published reports and the RI field program. More detailed information is located in the RI Report.

Topography

The Site is situated within the North Coast Limestone Province on a flat plain of outcropping or very shallow Aymamon Limestone bedrock. East-west trending mogote hills border the southern and northern edges of the Site's flat topography. Most of the Site consists of closely spaced houses and large areas of concrete pavement. The Site slopes gently from an elevation of about 60 meters above sea level (masl) on the western side of the Site down to about 55 masl on its eastern flank. There are no surface water bodies or significant depressions identified on the Site, with the exception of an intermittent storm water drainage ditch that bisects the Site from west to east. To the east of the Site, beyond Route 22 (a multi-lane highway) the land slopes down towards the edge of the Rio Indio flood plain. Isolated small mogotes are found within this moderately sloping area between the Site and the river flood plain. The flood plain, about

one-half kilometer east of the Site, is as much as 30 meters lower in elevation than the surrounding land. Its edge is marked by a well-defined northeast-southwest-trending scarp slope. Small ephemeral stream valleys punctuate the length of the scarp, one of which is fed by an on-Site drainage channel.

The area within a mile north of the Site was surveyed for springs and only Ojo de Agua was found. The steep rock scarp above the Rio Indio flood plain east of the Site was also surveyed for spring seeps. None were observed during the investigation, which occurred during a period of heavy rainfall.

The Site is located within the regional Rio Cibuco watershed system. Rio Indio, a tributary of Rio Cibuco, flows from the Site approximately 1.5 miles northeast to its confluence with the Rio Cibuco. The Rio Cibuco meanders northwards across the broad coastal plain for approximately 5 miles to the coast where it empties into the Atlantic Ocean. The Rio Cibuco at Vega Baja has a mean flow rate of 91 cubic feet per second (cfs). Similar flow rate data are not readily available for the Rio Indio.

As with most karst limestone terrain, surface water flow in the region is largely confined to rivers (e.g., the Rio Indio and Rio Cibuco to the east of the Site). Based on regional water table potentiometric surface information, the Rio Indio is a gaining river, meaning that groundwater discharges to the river, contributing to its baseflow. At its closest position, the Rio Indio is located about 0.2 mile to the east of the Site boundary.

Heavy rainfall, coupled with dense, clayey surface deposits tend to favor storm water surface; runoff rather than downward percolation through surficistl deposits or bedrock at the Site. On-Site storm waters are directed from impermeable surfaces such as buildings and asphalt surfaces to the drainage channel which bisects the Site, directing surface water flow through a culvert under the elevated highway (PR Route 22), toward its discharge into the Rio Indio.

Geology

Puerto Rico is divided into three geologic provinces: an older Cretaceous-age central volcanic-plutonic province trending east to west, and two younger Tertiary limestone provinces along its northern and southern coastal margins. The Site lies within the Northern Limestone Province (NLP).

The bedrock formations of the NLP are of late-middle Tertiary-age (early Miocene). These rocks consist of a sequence of limestones and terrigenous sedimentary rocks of Oligocene to Pliocene age that strike east-west and normally dip 2 to 5 degrees to the north. The limestone succession unconformably overlies Cretaceous volcanic, volcaniclastic, and intrusive igneous basement rocks. Within the area of the Manati topographic quadrangle, the sequence is divided into six bedrock formations. In order of decreasing age, the formations are the San Sebastian Formation, Mucarabones Sand, Cibao Formation, Aguada Limestone, and Aymamon Limestone. These units are described briefly below:

San Sebastian Formation. The lowermost sedimentary unit of the NLP is the San Sebastian Formation that unconformably overlies the volcanic basement. The San Sebastian crops out in two discontinuous bands of clayey, silty conglomerate and feldspathic sandstone along the southwestern and southeastern edges of the North Coast Limestone aquifer system. It extends into the subsurface where it is more laterally extensive but grades into glauconitic mudstone and marl. The San Sebastian interfingers with the Mucarabones Sand to the east but its exact relation with that unit is unknown. The San Sebastian ranges in thickness from a featheredge where it crops out to about 1,000 feet in the deep subsurface. It yields small quantities of water in outcrop areas but is poorly transmissive and functions mostly as a confining unit, especially in downdip areas.

Mucarabones Sand. The Mucarabones Sand consists predominantly of cross-bedded, fine to medium quartz sandstone that grades upward into sandy limestone near the top. The sandstone is moderately to poorly sorted and a clay matrix in the lowermost part is replaced by a calcite cement higher in the section. Local conglomerates in the formation contain volcanic-rock cobbles up to 1.5 inches in diameter. The formation overlies, in part, the San Sebastian Formation and, in part, volcanic rocks. The Mucarabones Sand ranges in thickness from about 33 feet at its western extent (near Ciales) to about 400 feet near Bayamon. The Mucarabones is a stratigraphic equivalent of both the Lares Limestone and the Cibao Formation.

Cibao Formation. The Cibao Formation is divided into a number of members that represent a variety of depositional environments. The Cibao Formation is a heterogeneous unit consisting of intergradational and interlensing beds of calcareous clay, limestone, sandy clay, sand, sandstone, and gravel. The total thickness of the Cibao Formation is approximately 490 feet (150 m in the study area).

Aguada Formation. The Aymamon Formation is underlain by the Aguada Formation. The Aguada Limestone is characterized by massive white or pink fossiliferous limestone and sandy limestone with extensive moldic secondary porosity and common clay interbeds. The Aguada Formation is up to 350 feet thick and has an overall finer-grained texture than the Aymamon Formation. About 100 feet below the contact between the two limestone formations, a 30-foot-thick sandy limestone can be traced across the Site, and dips gently towards the north, parallel to bedding. The sandy limestone may contain up to 50 percent sand and is also relatively more clay-rich than the rest of the formation.

Aymamon Formation. The uppermost bedrock unit comprises massive limestones of the Aymamon Formation, which is up to 650 feet thick. The dolines or mogotes which surround the Site are outcrops of the Aymamon Formation. Small on-Site sinkholes have developed in both the Aymamon and the underlying Aguada formations. The Aymamon Formation is overlain by soils within topographic degressions, and is exposed on the crests of the steep-sided mogotes.

Typically, the limestones are massive; pink, brown, or white; fossiliferous,- occasionally sandy; and may contain cavities or fractures, with the degree of weathering noted to decrease gradually

with depth. Clay-rich beds or clay-filled solution cavities are likely present in the lower Aymamon Formation, immediately above the contact with the underlying Aguada Formation.

The Site is underlain by an unconsolidated deposit that consists of clay and sandy clay that overlies the Aymamon Limestone. With the exception of surrounding mogotes, the Aymamon Limestone outcrops beneath the Site under a cover of Quaternary blanket deposits. The thickness of the surface deposit measured during limited subsurface investigations conducted by EQB and an EPA contractor, and during installation of seven new RI monitoring wells was between 0.5 and 15.5 feet. The Aymamon Limestone was the primary geologic unit encountered below the surface soils. The limestone unit is approximately 200 feet thick in the Site's vicinity. Drilling logs and core descriptions indicate the Aymamon Limestone consists of white to pale orange, heavily weathered limestone that ranges in texture from chalky to fossiliferous to crystalline. Large pockets of yellow clay and numerous cavities were observed throughout the formation, as well as some pockets of reddish-orange to light-brown sandy material. Although significant color or lithologic changes were not noted during air rotary drilling, it is likely that the underlying Aguada (Los Puertos) Limestone was penetrated in wells greater than 200 feet deep (thickness of the Aymamon Formation).

Hydrogeology

The North Coast Limestone aquifer system in Puerto Rico is one of the largest and most productive sources of groundwater on Puerto Rico. The North Coast Limestone aquifer system consists of a thick sequence of carbonate rocks of Miocene to Oligocene age that formed as platform deposits on the south flank of a broad depositional basin that extends from Puerto Rico about 100 miles northward to the southern slope of the Puerto Rico Trench. The aquifer system consists mostly of limestone; however, not all strata yield water. Maximum known onshore thickness of the limestones is about 5,600 feet, but their maximum estimated offshore thickness is 11,500 feet. These numerous geologic units have been combined into an upper and a lower aquifer, separated by a confining unit.

The regional hydrogeology around Vega Baja is characterized by an upper unconfined aquifer composed of the permeable parts of the Cibao Formation, the Aguada Limestone, and the Aymamon Limestone. Vertical groundwater flow is limited by the relatively impermeable part of the Cibao Formation, which forms the lower boundary of the upper aquifer along the south of the study area. A lower artesian (confined) aquifer is present below the top of the Cibao Formation.

The lower aquifer of the North Coast Limestone contains water under artesian pressure throughout the area where it is overlain by the confining unit. The San Sebastian Formation, the Lares Limestone, the Montebello Limestone, the Rio Indio Limestone, the Quebrada Arenas Members of the Cibao Formation, and the Mucarabones Sand that compose the lower aquifer, are unconfined in their outcrop areas.

The Site is located in karst terrain where sinkholes are a common occurrence and there are very few flowing streams. The Site is located in a principal recharge area for the upper aquifer. The

rate of recharge to the water table aquifer at the Site is controlled partly by the thickness of clay-rich soils that overlie the limestone, retarding direct infiltration of precipitation. The path that storm water takes from the surface to the water table is often complex.

Observations of the groundwater levels in nearby wells show that recharge generally occurs during the rainy season from August through December, with a secondary recharge period in April or May. According to the regional water table map for 1995, groundwater generally is encountered at approximately 5 meters (-15 feet) masl or approximately 200 feet bgs.

Groundwater moves both horizontally and vertically from areas of high head to areas of low head, along flow lines whose trend is perpendicular to the contour lines of equipotential head that are typically constructed to depict the water table elevation and groundwater flow direction. The regional direction of groundwater flow at the Site generally is north-northeast towards the regional discharge area along and beyond the Atlantic coastal plain. Cones of depression resulting from groundwater supply well withdrawals have been identified in Vega Baja and have caused local perturbations and reversals in the regional flow gradient.

GROUNDWATER SAMPLING AND ANALYTICAL RESULTS

At the time of the RI, the available groundwater data did not fully characterize the groundwater conditions at the Site. Therefore, groundwater flow and on-Site water quality conditions were evaluated. to determine whether past waste disposal practices at the Site impacted groundwater. This evaluation included the following: installation and sampling on-Site monitoring wells, sampling existing off-property wells, sampling of the Rio Indio, and sampling off-property springs/seeps during the spring/seep reconnaissance survey.

EPA collected groundwater samples to define the nature and extent of Site-related contamination in the underlying groundwater. Two rounds of groundwater samples were conducted; the first round was conducted on May 2002 after completion and development of seven (7) new RI monitoring wells, and the second round occurred in July 2002. For each round samples were collected from seven new RI monitoring wells (Appendix III, Figure 3), three existing monitoring wells (Appendix III, Figure 3), and five off-Site water supply wells (Appendix III, Figure 4) .

All groundwater samples (including the spring sample) were analyzed for TCL/TAL parameters including low-detection level Volatile Organic Compounds (VOCs) through the EPA CLP. All groundwater samples also were analyzed for Total Dissolved Solids (TDS), alkalinity, Total Suspended Solid (TSS), Total Kjeldahl Nitrogen (TKN), hardness, ammonia, nitrate-nitrite, Total Organic Constituents (TOC), Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), sulfate, chloride, methane, ethane, and ethene. Fe+2 ; Do, pH, salinity, conductivity, turbidity and Eh were measured in the field. The groundwater sample analytical results were screened against the National Primary Drinking Water Standards and the Region 9 Risk-Based Concentration Screening Toxicity Value. The data indicate that the groundwater beneath the Site is essentially free of Site-related contaminants.

One sample taken from an upgradient well contained arsenic at 3.4 µg/L; however, the detected value of 3.4 µg/L did not exceed the federal MCL of 50 µg/L, which is the Applicable or Relevant and Appropriate Requirement for groundwater, or the proposed federal MCL of 10 µg/L at the Site. Chromium also was detected in 22 of the 26 samples collected. The chromium concentrations ranged from 0.62 µg/L to 13.4 µg/L. The maximum concentration, 13.4 µg/L, was detected in monitoring well CMW-6 (Figure 3) during the first groundwater sampling round. Manganese was detected in 23 of the 26 samples collected. The manganese concentrations ranged from 0.505 µg/L to 110.5 µg/L. The maximum concentration was detected in the downgradient off-site monitoring well, Vega Baja 1 (Figure 4), during the first groundwater sampling round. Chloroform was detected in 17 of the 25 samples collected. The chloroform concentrations ranged from 0.14 µg/L to 2.2 µg/L. The maximum concentration was detected in the downgradient off-site monitoring well, Vega Baja 3, during the second groundwater sampling round.

In addition, EPA collected spring samples to further evaluate the nature and extent of any Site-related contamination in the underlying groundwater. One spring, identified during area reconnaissance, was sampled in October 2001 and May 2002. The spring represents the discharge location of local groundwater to surface water.

All spring samples were analyzed for TCL/TAL parameters including low-detection level VOCs through the EPA CLP and were also analyzed for TDS, alkalinity, TSS, TKN, hardness, ammonia, nitrate-nitrite, TOC, COD, BOD, sulfate, chloride, methane, ethane, and ethene. Fe^{+2}, Do, pH, salinity, conductivity, turbidity and ph were measured in the field. Spring samples analytical results were screened against the National Primary Drinking Water Standards. There were no exceedances of any regulatory standards.

CONCLUSIONS OF THE REMEDIAL INVESTIGATION

The significant findings of the RI are as follows:

1. Groundwater beneath the Site is essentially free of Site-related contaminants.

2. There were no exceedances of regulatory standards or criteria for spring water indicating that the groundwater discharging to the surface at the spring is unaffected by the Site.

SUMMARY OF SITE RISKS

Based upon the results of the RI, a baseline human health risk assessment and an ecological risk evaluation were conducted to estimate the risks associated with current and future Site conditions. A baseline risk assessment is an analysis of the potential adverse human health or ecological effects caused by hazardous substance exposure from a Site in the absence of any actions to control or mitigate such exposure under current and future land uses.

Human Health Risk Assessment

A four-step process is utilized for assessing Site-related human health risks for reasonable maximum exposure scenarios. Hazard Identification identifies the contaminants of concern at the Site in various media (i.e.. soil, groundwater, surface water, and air) based on several factors such as toxicity, frequency of occurrence, and concentration. Exposure Assessment estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed. A "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated. Toxicity Assessment determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). Risk Characterization summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of Site-related risks. Current Federal guidelines for acceptable exposures are an individual lifetime excess carcinogenic risk in the range of 10^{-4} to 10^{-6}, which can be interpreted to mean that an individual may have a one-in-ten-thousand to a one-in-a-million increased chance of developing cancer as a result of Site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at the Site.

To assess the overall potential for non-carcinogenic effects posed by more than one contaminant, EPA has developed a Hazard Index (HI). The HI measures the assumed simultaneous subthreshold exposures to several chemicals which could result in an adverse health effect. When the HI exceeds 1, there may be concern for potential non-carcinogenic health effects.

The current land uses at the Site are residential and unused farmland. It is anticipated that the land uses will not change in the foreseeable future. Since the Remedial Investigation was focused on the groundwater, the Human Health risk assessment focused on only those contaminants detected in groundwater.

The risk assessment began with selecting contaminants of potential concern in the groundwater that would be representative of Site risks. The contaminants of concern are: chromium, manganese, and chloroform (Table 1).

In this risk assessment, pathways were identified, assuming no Site remediation occurs. This assessment also assumed no restrictions to groundwater Site access or use exist. Individuals could potentially be exposed to contaminated groundwater at the Site through three general routes: ingestion, dermal contact, and inhalation (Table 2).

The risk assessment took a conservative approach to identifying potentially exposed populations or human receptors. On-Site groundwater was assumed to be the sole source of water supply for the exposed population in current and future use scenarios. Residents were assumed to be exposed to groundwater via ingestion, dermal contact, and inhalation during showering.

The exposure for each receptor population was evaluated to estimate the potential risks and hazards associated with the contaminants of concern. The carcinogenic risks and non-carcinogenic hazards were calculated using standard equations and employed the use of toxicity values (Tables 3 and 4). Chloroform and chromium were evaluated for non-carcinogenic hazards and carcinogenic risk. As chromium is not a volatile compound, carcinogenic risk from chromium exposure via the inhalation pathway was not calculated. Manganese was only evaluated for non-carcinogenic hazards because it is not classifiable as a human carcinogen.

The results of the human health risk assessment indicate that the potential carcinogenic risks from ingestion, inhalation, and dermal contact were lower than or within the acceptable excess cancer risk range for the residential population, which includes adults and children. For this human health risk assessment it was assumed that the adult and child (0-6 yrs) residents were exposed to groundwater through ingestion of tap water, dermal contact, and inhalation of vapors while showering. The total reasonable maximum exposure cancer risk for current and future residents (adult and child) exposures was 2×10^{-5}, which is within the EPA acceptable risk range of 10^{-4} to 10^{-6} (Table 5).

At the Site, the non-cancer hazards from inhalation, dermal contact, and ingestion were below the HI of 1 for both adult and child, indicating that there is not a concern for potential chronic adverse non-cancer health effects from chemicals in groundwater at the Site. The total reasonable maximum exposure Hazard Index for adult residents was 0.2 and for child residents was 0.6 (Table 6) .

Ecological Risk Assessment

The ecological impacts from surface water, sediments and soils will be evaluated during the Remedial Investigation for Operable Unit 2 - Soils. A Screening Level Ecological Risk Assessment for the groundwater pathway at the Site was not recommended for the following reasons:

- Groundwater is 200 feet below the ground surface;
- No groundwater discharge points are present on or adjacent to the Site and groundwater is so deep that no complete pathway exists for ecological receptors to be exposed to Site groundwater; and
- Ojo de Agua spring is located 1.4 miles northwest of the Site and is side gradient from the Site groundwater flow. No analytes were detected above screening criteria in two rounds of sampling from the spring.

SUMMARY OF THE SELECTED NO ACTION REMEDY

Under the No Action remedy, no funds will be expended on any remedial action for groundwater. The conclusions of the groundwater RI indicate the following:

- Site groundwater was found to be unaffected by Site-related contaminants.

- The significant 200-foot thickness of the unsaturated zone as well as the clay-rich nature of Site soils and weathered bedrock have most likely attenuated the migration of Site contamination into the groundwater.

- The spring analytical results also did not show Site-related contamination.

The human health risk assessment indicates that groundwater at the Site does not present an unacceptable risk. There were no exceedances of inorganic primary drinking water standards. As a result, no remedial action is necessary for groundwater at the Site.

DOCUMENTATION OF SIGNIFICANT CHANGES

There are no significant changes from the preferred remedy presented in the Proposed Plan.

APPENDIX I
Administrative Record Index

VEGA BAJA SOLID WASTE DISPOSAL SUPERFUND SITE
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

1.0 SITE IDENTIFICATION

1.1 Background - RCRA and Other Information

P. 100001 - 100031 Aerial Photographic Analysis, Vega Baja Solid Waste Disposal Site, Vega Baja, Puerto Rico, Report 1 - Solid Waste Disposal Site Characterization, prepared by D. R. Williams, Environmental Services Division, Lockheed Environmental Systems & Technologies Co., prepared for U.S. EPA, July 1998.

1.4 Site Investigation Reports

P. 100032 - 100183 Report: Final Report, Assessment of Soil Dioxin Contamination, Vega Baja Solid Waste Disposal Site, prepared by Lockheed Martin/REAC, prepared for U.S. EPA/ERTC, February 2002.

1.4 Site Investigation Reports

Assessment of Soil Lead Contamination

P. 100184 - 100240 Report: Final Report, Assessment of Soil Lead Contamination, Vega Baja Landfill Site, Vega Baja, Puerto Rico, prepared by Lockheed Martin/ REAC, prepared for U.S. EPA/ERTC, January 2000.

P. 100241 - 100784 Report: Final Report, Assessment of Soil Lead Contamination, Vega Baja Landfill Site, Vega Baja, Puerto Rico, Appendix 1A, Phase I XRF and Confirmation Results, prepared by Lockheed Martin/REAC, prepared for U.S. EPA/ERTC, January 2000.

P. 100785 - 101384 Report: Final Report, Assessment: of Soil Lead Contamination, Vega Baja Landfill Site, Vega Baja, Puerto Rico, Appendix 2A, Phase II XRF and Confirmation Results, prepared by Lockheed Martin/REAC, prepared for U.S. EPA/ERTC, January 2000.

P. 101385 - 101531 Report: Final Report, Assessment of Soil Lead Contamination, Vega Baja Landfill Site, Vega Baja, Puerto Rico, Appendix 4. Individual Property Maps of 43 Homes Identified for Removal Action, prepared by Lockheed Martin/REAC, prepared for U.S. EPA/ERTC, January 2000.

1.4 Site Investigation Reports

Sampling Trip Reports

P. 101532 - 101559 Report: Sampling Trip Report, Vega Baja Landfill, prepared by Mr. John Szalkowski, START PM, Roy F. Weston, Inc., prepared for U.S. EPA, February 12, 1998.

P. 101560 - 101579 Report: Sampling Trip Report, Vega Baia Landfill, prepared by Mr. Hector M. Santana, Region II START Sampler and Mr. Miguel A. Maldonado, Region II START Site Project Manager (Alternate) & Sampler, Roy F. Weston, Inc. prepared for U.S. EPA, April 27, 1999, (cover letter attached.)

P. 101580 - 101604 Report: Sampling Trip Report, Vega Baja Landfill, prepared by Mr. Hector M. Santana, Region II START Sampler and Mr. Miguel A. Maldonado, Region II START Site Project Manager (Alternate) & Sampler, Roy F. Weston, Inc. prepared for U.S. EPA, July 2, 1999, (cover letter attached.)

P. 101605 - 101621 Report: Sampling Trip Report, Vega Baja Landfill, prepared by Mr. Doel A. Miranda, Region II START Site Project Manager & Sample Collection, Roy F. Weston, Inc., prepared for U.S. EPA, December 9, 1999, (cover letter attached.)

P. 101622 - 101700 Report: Sampling Trip Report, Vega Baja Landfill, prepared by Mr. Doel A. Miranda, Site Project Manager, Roy F. Weston, Inc., prepared for U.S. EPA, December 28, 1999, (cover letter and transmittal memorandum attached.)

2.0 REMOVAL RESPONSE

2.1 Sampling and Analysis Plans

P. 200001 - 200311 Report: Vega Baja Site, Disposal Alternatives Study, Vega Baja, Puerto Rico, prepared by Roy F. Weston, Inc., prepared for U.S. EPA, Region 2, November 1998.

P. 200312 - 200491 Report: Health and Safety Plan for Vega Baja Solid Waste Disposal Site Removal Actions Activities, prepared by Roy F. Weston, Inc. and Sarriera & Associates, prepared for U.S. EPA, Region 2, October 1999.

2.2 Sampling and Analysis Data/Chain of Custody Forms

P. 200492 - 200888 Report: Monitoring Well Installation and Groundwater Sampling Report Vega Baja Solid Waste Disposal, Rio Abajo Ward, Vega Baja, Puerto Rico, prepared by Region II Superfund Technical Assessment and Response Team, Roy F. Weston, Inc., prepared for U.S. EPA, Region 2, October 1998.

P. 200889 - 201067 Memorandum to Mr. Terrence Johnson, REAC Task Leader, through Mr. Vinod Kansal, REAC Analytical Section Leader, Roy F. Weston, Inc., from Mr. Jay Patel, REAC Inorganic Group Leader, Roy F. Weston, Inc. re: FPXRF Analyses, Vega Baja Landfill Site, Vega Baja, Puerto Rico, Work Assignment #3-356 - Phase II FPXRF Activities Report, December 4, 1998.

P. 201068 - 201290 Report: Data Package for Total Metals, Part I, prepared by Chemtech, prepared for Roy F. Weston, Inc., July 15, 1999.

P. 201291 - 201467 Report: Data Package for TCLP Metals, Part II, prepared by Chemtech, prepared for Roy F. Weston, Inc., July 15, 1999.

P. 201468 - 202452 Letter to Weston from CompuChem re: attached Report of Data, Account Number 705026 Order#34667 December 8, 1999.

2.2 Sampling and Analysis Data/Chain of Custody Forms

Data Validation Assessments

P. 202453 - 202488 Memorandum (with attachments) to Mr. Angel Rodriguez, OSC, Removal Action Branch, U.S. EPA Region 2, from Ms. Smita Sumbaly, Data Reviewer, START Region II, Roy F. Weston, Inc., re: Vega Baja Landfill Data Validation Assessment, July 16, 1999.

P. 202489 - 202545 Memorandum (with attachments) to Mr. Angel Rodriguez, OSC, Removal Action Branch, U.S. EPA Region 2, from Ms. Smita Sumbaly, Data Reviewer, START Region II, Roy F. Weston, Inc., re: Vega Baja Landfill Data Validation Assessment, August 4, 1999.

P. 202546 - 202598 Memorandum (with attachments) to Mr. Angel Rodriguez, OSC, Removal Action Branch, U.S. EPA Region 2, from Ms. Smita Sumbaly, Data Reviewer, START Region II, Roy F. Weston, Inc., re: Vega Baja Landfill Data Validation Assessment, August 4, 1999.

P. 202599 - 202689 Memorandum (with attachments) to Mr. Tom Budroe, OSC, Removal Action Branch, U.S. EPA, Region 2, from Ms. Adly A. Michael, Data Reviewer, and Mr. Doel Miranda, PM, START Region II, Roy F. Weston, Inc., re: Vega Baja Landfill Data Validation Assessment, October 27, 1999.

P. 202690 - 202784 Memorandum (with attachments) to Mr. Angel Rodriguez, U.S. EPA, Region 2, from Mr. Doel Miranda, Roy F. Weston, Inc., re: Vega Baja Landfill Data Validation Assessment, October 29, 1999.

P. 202785 - 202877 Memorandum (with attachments) to Mr. Tom Budroe, OSC, Removal Action Branch, U.S. EPA, Region 2, from Ms. Adly A. Michael, Data Reviewer, and Mr. Doel Miranda, PM, START Region II, Roy F. Weston, Inc., re: Vega Baja Landfill Data Validation Assessment, November 12, 1999.

P. 202878 - 202933 Memorandum (with attachments) to Mr. Angel Rodriguez, OSC, Removal Action Branch, U.S. EPA, Region 2, from Ms. Smita Sumbaly, Data Reviewer, START Region II, Roy F. Weston, Inc., re: Vega Baja Landfill Data Validation Assessment, January 14, 2000.

P. 202934 - 202998 Memorandum (with attachments) to Mr. Angel Rodriguez, OSC, Removal Action Branch, U.S. EPA, Region 2, from Mr. David Rosenberg, Data Reviewer, START Region II, Roy F. Weston, Inc., re: Vega Baja Landfill Data Validation Assessment, January 20, 2000.

P. 202999 - 203223 Memorandum (with attachments) to Mr. Angel Rodriguez, OSC, Removal Action Branch, U.S. EPA, Region 2, from Ms. Smita Sumbaly, Inorganic Data Reviewer, START Region II, Roy F. Weston, Inc., re: Vega Baja Solid Waste Disposal Site Data Validation Assessment, January 24, 2000.

P. 203224 - 203281 Memorandum (with attachments) to Mr. Angel Rodriguez, OSC, Removal Action Branch, U.S. EPA, Region 2, from Ms. Smita Sumbaly, Inorganic Data Reviewer, START Region II, Roy F. Weston, Inc., re: Vega Baja Landfill Data Validation Assessment, March 29, 2000.

2.2 Sampling and Analysis Data/Chain of Custody Forms

DataChem Analytical Results

P. 203282 - 203398 Report: DataChem Analytical Results DCL Set ID No. 99C-0155-01, prepared by Mr. Michael J. Schwendiman, DataChem Laboratories, prepared for Roy F. Weston, July 28, 1999.

P. 203399 - 203521 Report: DataChem Analytical Results DCL Set ID No. 99C-0155-02, prepared by Mr. Michael J. Schwendiman, DataChem Laboratories, prepared for Roy F. Weston, July 28, 1999.

P. 203522 - 203638 Report: DataChem Analytical Results DCL Set ID No. 99C-0155-03, prepared by Mr. Michael J. Schwendiman, DataChem Laboratories, prepared for Roy F. Weston, August 2, 1999.

P. 203639 - 203754 Report: DataChem Analytical Results DCL Set ID No. 99C-0155-04, prepared by Mr. Michael J. Schwendiman, DataChem Laboratories, prepared for Roy F. Weston, August 2, 1999.

P. 203755 - 203873 Report: DataChem Analytical Results DCL Set ID No. 99C-0155-05, prepared by Mr. Michael J. Schwendiman, DataChem Laboratories, prepared for Roy F. Weston, August 2, 1999.

P. 203874 - 203983 Report: DataChem Analytical Results DCL Set ID No. 99C-0155-07, prepared by Mr. Michael J. Schwendiman, DataChem Laboratories, prepared for Roy F. Weston, August 2, 1999.

P. 203984 - 204008 Report: DataChem Analytical Results DCL Set ID No. 99C-0309-03, prepared by Young W. Han, DataChem Laboratories, prepared for Roy F. Weston, December 12, 1999.

2.3 EE/CA Approval Memorandum (for non-time-critical removals)

P. 204009 - 204019 Memorandum to Mr. Richard L. Caspe, Director, Emergency and Remedial Response Division, Through Mr. Richard C. Salkie, Chief, Removal Action Branch, from Mr. Thomas Budroe, On-Scene Coordinator, Removal Action Branch, U.S. EPA, Region 2, re: Engineering Evaluation/Cost Analysis Approval Memorandum, June 28, 1999.

2.5 Action Memorandum

P. 204020 - 204041 Memorandum to Mr. Richard L. Caspe, Director, Emergency and Remedial Response Division, Through Mr. Richard C. Salkie, Chief, Removal Action Branch, from Mr. Thomas Budroe, On-Scene Coordinator, Removal Action Branch, and Mr. Angel Rodriguez, On-Scene Coordinator, Enforcement and Superfund Branch, U.S. EPA, Region 2, re: Request for a Removal Action at the Vega Baja Solid Waste Disposal Site, Rio Abajo Ward, Vega Baja, Puerto Rico, August 18, 1999.

2.7 Correspondence

P. 204042 - 204062 Memorandum to File from Mr. Thomas Budroe, On-Scene Coordinator, Enforcement Management Team, U.S. EPA, Region 2, re: Removal Site Evaluation for the Vega Baja Solid Waste Disposal Site, Rio Abajo Ward, Vega Baja, Puerto Rico, June 25, 1999.

P. 204063 - 204084 Letter to Mr. Hector Russe, Chairman, Puerto Rico Environmental Quality Board, from Mr. Richard Caspe, Director, Emergency and Remedial Response Division, U.S. EPA, Region 2, re: the attached Removal Site Evaluation for the Vega Baja Solid Waste Disposal Site, Rio Abajo Ward, Vega Baja, Puerto Rico, July 6, 1999.

P. 204085 - 204085 Letter to Mrs. Norma Santana, Librarian, Municipal Public Library (City Hall), from Mr. Angel C. Rodriguez, On-Scene Coordinator, Enforcement and Superfund Branch, U.S. EPA, Region 2, re: transmittal of record files for the Brisas del Rosario Site to the Vega Baja Municipal Public Library, the designated administrative record facility, November 4, 1999.

2.7 Correspondence

Pollution Reports (POLREPs)

P. 204086 - 204092 U.S. EPA Initial Pollution Report, POLREP No. 1, Vega Baja Solid Waste Disposal Site, October 19, 1999.

P. 204093 - 204095 U.S. EPA Pollution Report, POLREP No. 2, Vega Baja Solid Waste Disposal Site, November 5, 1999.

P. 204096 - 204097 U.S. EPA Pollution Report, POLREP No. 3, Vega Baja Solid Waste Disposal Site, November 8, 1999.

P. 204098 - 204101 U.S. EPA Pollution Report, POLREP No. 4, Vega Baja Solid Waste Disposal Site, November 26, 1999.

P. 204102 - 204105 U.S. EPA Pollution Report, POLREP No. 5, Vega Baja Solid Waste Disposal Site, December 6, 1999.

P. 204106 - 204109 U.S. EPA Pollution Report, POLREP No. 6, Vega Baja Solid Waste Disposal Site, December 11, 1999.

P. 204110 - 204113 U.S. EPA Pollution Report, POLREP No. 7, Vega Baja Solid Waste Disposal Site, December 21, 1999.

P. 204114 - 204117 U.S. EPA Pollution Report, POLREP No. 8, Vega Baja Solid Waste Disposal Site, January 17, 2000.

P. 204118 - 204122 U.S. EPA Pollution Report, POLREP No. 9, Vega Baja Solid Waste Disposal Site, January 22, 2000.

P. 204123 - 204127 U.S. EPA Pollution Report, POLREP No. 10, Vega Baja Solid Waste Disposal Site, January 29, 2000.

P. 204128 - 204131 U.S. EPA Pollution Report, POLREP No. 11, Vega Baja Solid Waste Disposal Site, February 7, 2000.

P. 204132 - 204135 U.S. EPA Pollution Report, POLREP No. 12, Vega Baja Solid Waste Disposal Site, February 14, 2000.

3.0 REMEDIAL INVESTIGATION

3.3 Work Plans

P. 300001 - 300143 Report: Final Work Plan. Volume I, Vega Baja Solid Waste Disposal Site, Remedial Investigation/Feasibility Study. Vega Baja, Puerto Rico, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region 2, October 27, 2000.

P. 300144 - 300641 Report: Final Quality Assurance Project Plan, Vega Baja Solid Waste Disposal Site Remedial Investigation/Feasibility Study, Vega Baja, Puerto Rico, prepared by CDM Federal Programs Corporation1, prepared for U.S. EPA, Region 2, June 11, 2001.

P. 300642 - 300744 Report: Final Work Plan, Volume I, Vega Baja Solid Waste Disposal Site Remedial - Investigation/Feasibility Study, Operable Unit 2 - Soils Investigation, Vega Baja, Puerto Rico, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region 2, June 28, 2002.

3.4 Remedial Investigation Reports

P. 300745 - 300846 Report: Drilling Incident Report, Vega Baja Solid Waste Disposal Site Remedial Investigation/Feasibility Study, Vega Baja, Puerto Rico, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region 2, February 22, 2002. (NOTE: This document is **CONFIDENTIAL**. It is located at the U.S. EPA, Superfund Records Center, 290 Broadway, 18th Floor, N.Y., N.Y. 10007-1866.)

7.0 ENFORCEMENT

7.3 Administrative Orders

P. 700001 - 700026 Administrative Order In the Matter of the Vega Baja Solid Waste Disposal Superfund Site, Puerto Rico Land Authority; Puerto Rico Housing Department; Municipality of Vega Baja; Motorola Electronica de Puerto Rico, Inc., Respondents, Proceeding Under Section 106 (a) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. § 9606(a), September 16, 1999.

7.7 Notice Letters and Responses - 104e's

P. 700027 - 700027 Letter to Mr. Richard I. Caspe, Director, Emergency and Remedial Response Division, U. S. EPA, Region 2, from Mr. Patricio Martinez-Lorenzo, re: Vega Baja Solid Waste Disposal Superfund Site, Vega Baja, Puerto Rico, Notice of Potential for Information Pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9601 et. seq., June 21, 1999.

P. 700028 - 700029 Letter to Mr. Richard I. Caspe, Director, Emergency and Remedial Response Division, U.S. EPA, Region 2, from Alberto L. Ramos, Esq., re: Vega Baja Solid Waste Disposal Superfund Site - Vega Baja PR, Request of Additional Time to Submit Information Requested, June 21, 1999.

P. 700030 - 700030 Letter to Ms. Liliana Villatora, New York/Caribbean Superfund Branch, Office of Regional Counsel, U.S. EPA, Region 2, from Patricio Martinez-Lorenzo, Esq., by Ms. Amanda I. Figueroa-Torres, Legal Assistant, re: Vega Baja Solid Waste Disposal Superfund Site, Vega Baja, Puerto Rico, July 13, 1999.

P. 700031 - 700031 Letter to Ms. Liliana Villatora, New York/Caribbean Superfund Branch, Office of Regional Counsel, U.S. EPA, Region 2, from Mr. Alberto L. Ramos, re: Request of Extension of Time, Vega Baja Solid Waste Disposal Superfund Site, Vega Baja, Puerto Rico, Notice of Potential Liability Pursuant to CERCLA, July 22, 1999.

P. 700032 - 700033 Letter to Liliana Villatora, Esq., Assistant Regional Counsel, U.S. EPA, Region 2, re: Vega Baja Solid Waste Disposal Superfund Site, Vega Baja, Puerto Rico, Notice of Potential Liability and Request for Information Pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9601 et. seq., from Mr. Patricio Martinez-Lorenzo, July 23, 1999.

7.8 Correspondence

P. 700034 - 700038 Letter to Mr. Fernando Machado, Executive Director, Puerto Rico Land Authority; Puerto Rico Housing Department, c/o Patricio Martinez-Lorenzo, Esq.; Motorola Semimetales, Inc., c/o Carlos Humberto Dobal, Esq.; Mayor Luis E. Melendez-Cano, Municipality of Vega Baja; Motorola Electronica de Puerto Rico, Inc., c/o Carlos Humberto Dobal, Esq.; and Motorala de Puerto Rico, Inc., c/o Carlos Humberto Dobal, Esq., re: Vega Baja Solid Waste Disposal Superfund Site, Vega Baja, Puerto Rico, Notice of Potential Liability Pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9601 et. seq., from Mr. Richard Caspe, Director, Emergency and Remedial Response: Division, U.S. EPA, Region 2, July 6, 1999.

P. 700039 - 700043 Letter to Attached List of Addressees, re: Special Notice Concerning Remedial Investigation/Feasibility Study for Soil at the Vega Baja Solid Waste Disposal Superfund Site, Vega Baja, Puerto Rico, from Mr. George Pavlou, Director, Emergency and Remedial Response Division, U.S. EPA, Region 2, June 26, 2002.

8.0 HEALTH ASSESSMENTS

8.1 ATSDR Health Assessments

P. 800001 - 800075 Report: Public Health Assessment for Vega Baja Solid Waste Disposal, Rio Abajo Ward/La Trocha, Vega Baja County, Puerto Rico, prepared by Superfund Site Assessment Branch, Division of Health Assessment and Consultation, Agency for Toxic Substances and Disease Registry, November 30, 1998.

10.0 PUBLIC PARTICIPATION

10.4 Public Meeting Transcripts

P. 10.00001 - 10.00003 Public Availability Session Sign In Sheets, Public Availability Session, November 9, 1999.

NOTE: The following volumes of the Vega Baja Administrative Record for the Removal Program are incorporated into this Remedial Administrative Record by reference:

Volume 1, May 1999
Volume 2, May 1999
Volume 3, May 1999
Volume 4, September 1999
Volume 5, November 1999

VEGA BAJA SOLID WASTE DISPOSAL SITE
ADMINISTRATIVE RECORD FILE UPDATE #2
INDEX OF DOCUMENTS

3.0 REMEDIAL INVESTIGATION

3.4 Remedial Investigation Reports

P.	300847 - 300942	Report: Final Human Health Risk Assessment for Groundwater, Vega Baja Solid Waste Disposal Site, Remedial Investigation/Feasibility Study, Vega Bala, Puerto Rico, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA Region 2, July 16, 2003.
P.	300943 - 301449	Report: Final Remedial Investigation Report, Vega Baja Solid Waste Disposal Site, Remedial Investigation/Feasibility Study, Vega Baja, Puerto Rico, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA Region 2, July 18, 2003.

10.0 PUBLIC PARTICIPATION

10.9 Proposed Plan

P.	10.00045-10.00052	Superfund Proposed Plan, Vega Bala Solid Waste Disposal, Vega Baja Solid Waste Disposal Superfund Site, Operable Unit One: Groundwater. Vega Baja, Puerto Rico, prepared by U.S. EPA Region 2, November 2003.
P.	10.00053-10.00061	Hoja Informativa, Lugar de Superfondo de Vega Baja, Unidad Operacional Uno: Agua Subterranea. Hoja Informativa, Vega Bala, Puerto Rico, prepared by U.S. EPA Region 2, Noviembre 2003.

VEGA BAJA SOLID WASTE DISPOSAL SITE
ADMINISTRATIVE RECORD FILE UPDATE
INDEX OF DOCUMENTS

10.0 PUBLIC PARTICIPATION

10.2 Community Relations Plans

P.	10.00004 - 10.00044	Plan: Community Involvement Plan, Vega Baia Solid Waste Disposal Site, Vega Baja, Puerto Rico, Work Assignment No.: 131-RICO-02HJ, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region II, October 31, 2003.

APPENDIX II
Puerto Rico Environmental Quality Board's Concurrence Letter

COMMONWEALTH OF PUERTO RICO / OFFICE OF THE GOVERNOR
ENVIRONMENTAL QUALITY BOARD
SUPERFUND PROGRAM

March 9, 2004

Mr. Ramón Torres, P.E.
Superfund Remedial Project Manager
U.S. ENVIRONMENTAL PROTECTION AGENCY
Caribbean Environmental Protection Division
San Juan, Puerto Rico

RECORD OF DECISION
VEGA BAJA SOLID WASTE DISPOSAL SUPERFUND SITE
OPERABLE UNIT ONE: GROUNDWATER

Dear Mr. Torres:

The Puerto Rico Environmental Quality Board (PREQB), Superfund Core Program received the above referenced document for evaluation and comments. This document presents the remedial alternative for the Vega Baja Solid Waste Disposal Site Operable Unit One: Groundwater.

After evaluating this document the PREQB concurred with the remedial action presented, which is "No Action", for the Operable Unit I: Groundwater for the Vega Baja Solid Waste Disposal Site.

We request that USEPA keep us informed of all future activities performed on this site. If you have any questions regarding this matter, please contact Mrs. Enid Y. Villegas, Chief of the Superfund Core & RPM Divisions, at phone number (787) 764-4296 or by e-mail: enidvillegas@jca.gobierno.pr.

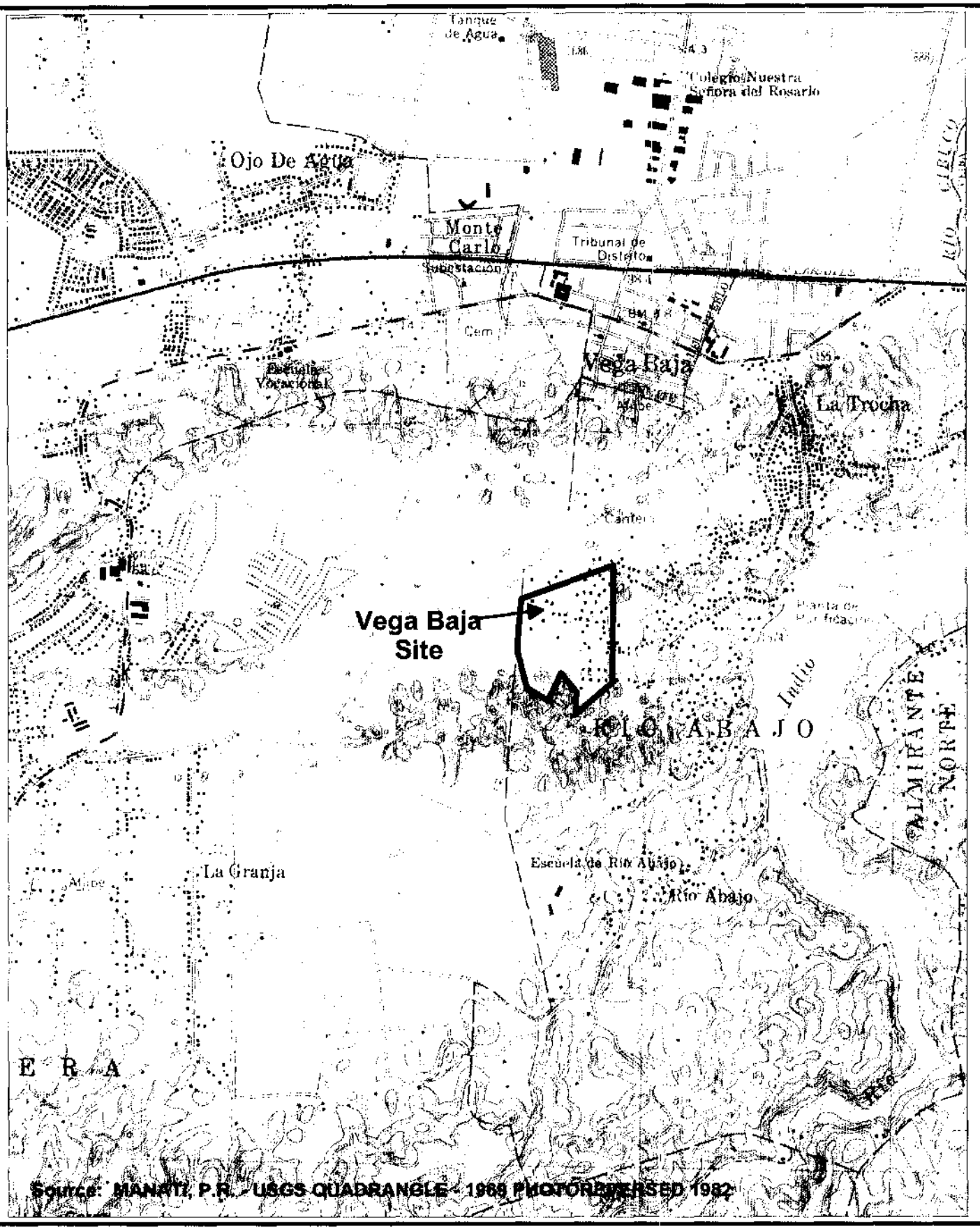
Cordially

Juan José Baba Peebles
Director
Emergency Response and Superfund Program

C: Mel Hauptman USEPA

APPENDIX III
FIGURES AND TABLES

FIGURE 1
Site Location



Source: MANATI, P.R. - USGS QUADRANGLE - 1968 PHOTOREVISED 1982

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Figure 1-1
Site Vicinity Map

Remedial Investigation/Feasibility Study
Vega Baja Solid Waste Disposal Superfund Site, Puerto Rico

FIGURE 2
Site Map

File Path: c:\vega_baja\vega_baja_working_new.apr

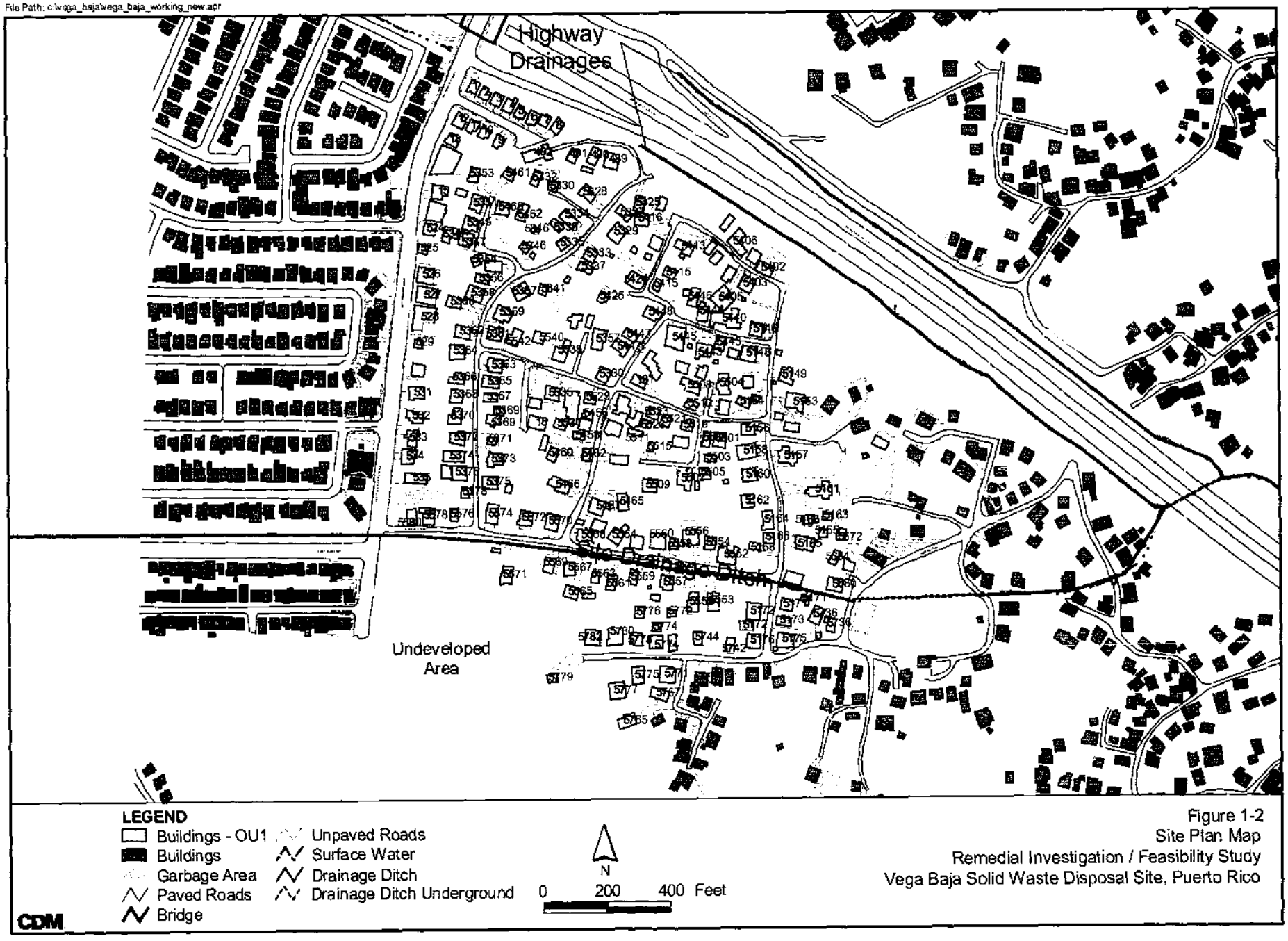


Figure 1-2
Site Plan Map
Remedial Investigation / Feasibility Study
Vega Baja Solid Waste Disposal Site, Puerto Rico

FIGURE 3
Monitoring Well Locations

File Path: c:\vega_baja\vega_baja_working_new.apr

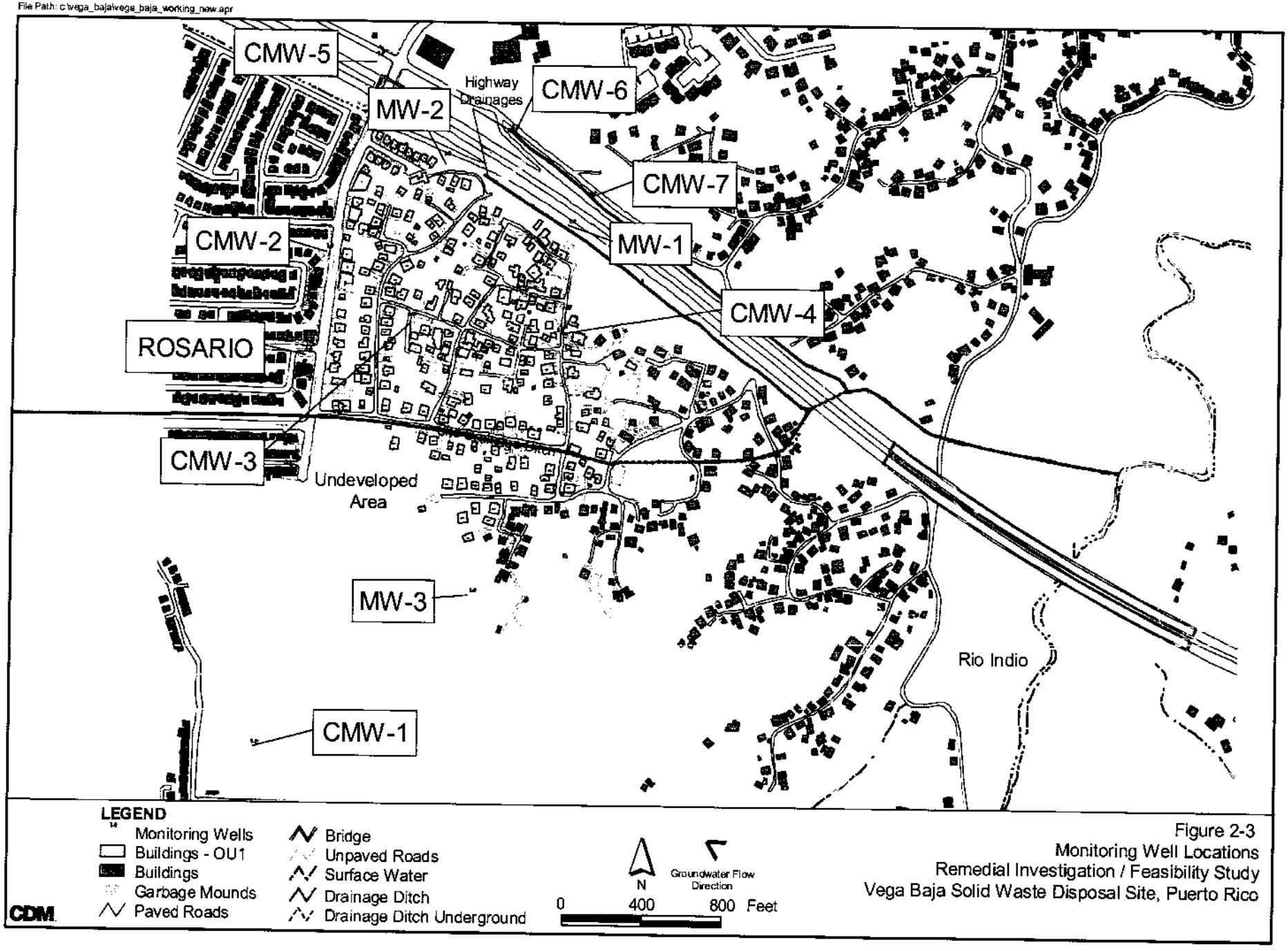
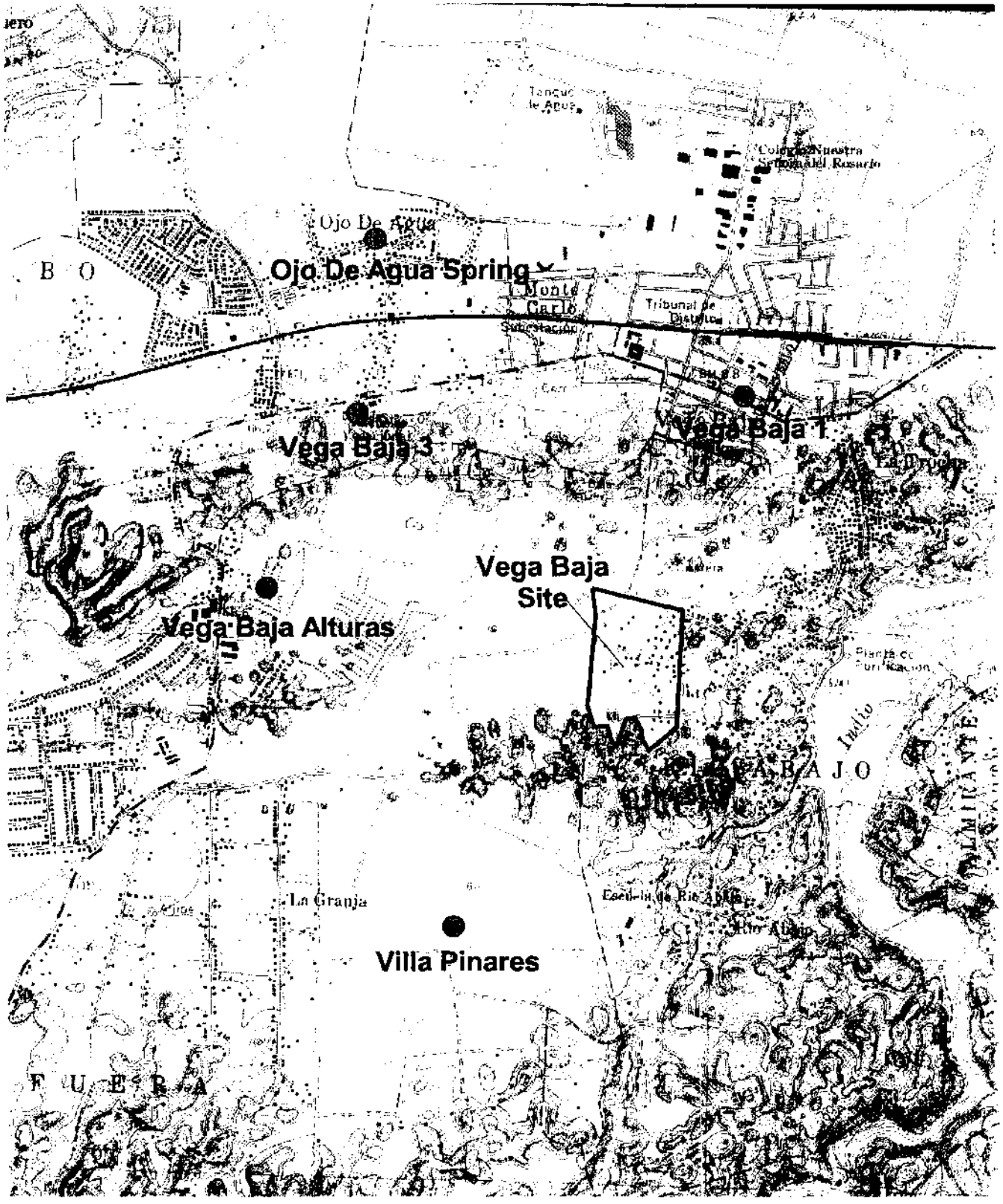


Figure 2-3
Monitoring Well Locations
Remedial Investigation / Feasibility Study
Vega Baja Solid Waste Disposal Site, Puerto Rico

FIGURE 4
Off-Site Wells Location

File Path: c:\vega_baja\vega_baja_working_new.apr



Source: U.S.G.S. 7.5 minute Quadrangle, Quad Name: Manati

LEGEND

● Springs and Public Supply Wells

N

Groundwater Flow Direction

0 2000 4000 Feet

CDM

Figure 2-4
Public Supply Well and Spring Sampling Locations
Remedial Investigation / Feasibility Study
Vega Baja Solid Waste Disposal Site, Puerto Rico

TABLES

TABLE 1

Page 1

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Tap Water	Chloroform	0.14	2.2	g/l	17/25	1.4	g/l	UCL-NP
	Chromium	0.62	13.4	g/l	22/26	7.1	g/l	95% UCL-T
	Manganese	0.51	110.5	g/l	23/26	62	g/l	95% UCL-T

UCL-NP = Non-parametric Upper Confidence Limit
95% UCL-T = 95% Upper Confidence Limit of log-transformed data

TABLE 2

Selection of Exposure Pathways

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Onsite/ Offsite	Rationale for Selection/Exclusion of Exposure Pathway
Current/Future	Groundwater	Groundwater	Tap water	Resident	Adult	Ingestion	Onsite	Groundwater used as potable water source by public supply wells and private wells.
						Dermal	Onsite	Groundwater used as potable water source by public supply wells and private wells.
					Child (0-6 yr)	Ingestion	Onsite	Groundwater used as potable water source by public supply wells and private wells.
						Dermal	Onsite	Groundwater used as potable water source by public supply wells and private wells.
		Indoor Air	Water Vapors in Bathroom	Resident	Adult	Inhalation	Onsite	Groundwater used as potable water source by public supply wells and private wells.
					Child (0-6 yr)	Inhalation	Onsite	Groundwater used as potable water source by public supply wells and private wells.
		Indoor Air	Vapor Intrustion in Homes	Resident	Adult	Inhalation	Onsite	If present in elevated concentrations in groundwater, volatile organic chemicals (VOCs) could migrate through the subsurface into houses via vapor intrusion.
					Child (0-6 yr)	Inhalation	Onsite	If present in elevated concentrations in groundwater, volatile organic chemicals (VOCs) could migrate through the subsurface into houses via vapor intrusion.

Summary of Selection of Exposure Pathways

The table presents all exposure pathways considered for the risk assessment, and the rationale for the inclusion of each pathway. Exposure media, exposure points, and characteristics of receptor populations are included.

TABLE 3

Non-Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
Chloroform	Chronic	1.0E-2	mg/kg-day	NA	1.0 E-2	mg/kg-day	Liver	1000	IRIS	07/01/02
Chromium[1]	Chronic	3.0E-3	mg/kg-day	2.5%	7.5 E-5	mg/kg-day	GI Tract	900	IRIS	07/01/02
Manganese[2]	Chronic	2.0E-2	mg/kg-day	4%	8.0 E-4	mg/kg-day	CNS	1	IRIS	07/01/02

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates:
Chloroform	Chronic	5.0E-2	mg/cu. m	1.43E-2	mg/kg-day	Liver/Kidney	1000	NCEA	05/30/03
Chromium	Chronic	1.0E-4	mg/cu. m	2.86E-5	mg/kg-day	Lungs	300	IRIS	07/01/02
Manganese	Chronic	5.0E-5	mg/cu. m	1.43E-5	mg/kg-day	CNS	1000	IRIS	07/01/02

[1] The RfD for hexavalent chromium has been applied to total chromium
[2] The RfD of 2.0E-2 mg/kg-day applies to nondietary exposures, and was calculated for the IRIS RfD of 1.4E-1 mg/kg-day as recommended in IRIS.

Key

NA: No information available
IRIS: Integrated Risk Information System, U.S. EPA
NCEA: National Center for Environmental Assessment, U.S. EPA

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in groundwaterl. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference doses (RfDi).

TABLE 4

Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Chloroform	NA	-----	NA	-----	B2	IRIS	07/01/02
Chromium	NA	-----	NA	-----	D	IRIS	07/01/02
Manganese	NA	-----	NA	-----	D	IRIS	07/01/02

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Chloroform	2.3E-5	mg/cu. m.	8.1E-2	mg/kg-day	B2	IRIS	07/01/02
Chromium[1]	1.2E-2	mg/cu. m.	4.2E+1	mg/kg-day	A	IRIS	07/01/02
Manganese	NA	-----	NA	-----	D	IRIS	07/01/02

[1] Chromium VI is an A carcinogen by the inhalation route, but D carcinogen by the oral route. The CSF for hexavalent chromium has been applied to total chromium.

Key

NA: No information available
IRIS: Integrated Risk Information System, U.S. EPA

EPA Group:

A - Human carcinogen
B2 - Probable Human Carcinogen - Indicates sufficient evidence in animals associated with the site and inadequate or no evidence in humans
D - Not classifiable as a human carcinogen

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in groundwater. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 5

Page 1

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Chloroform	-----	5.3E-6	-----	5.3E-6
			Chromium	-----	-----	-----	-----
			Manganese	-----	-----	-----	-----
						Total Risk =	5.3E-6

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child (0-6 yr)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tab Water	Chloroform	-----	1.95E-5	-----	1.95E-5
			Chromium	-----	-----	-----	-----
			Manganese	-----	-----	-----	-----
						Total Risk =	195E-5

TABLE 6

Page 1

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Chloroform	Liver	0.039	0.014	0.00006	0.018
			Chromium	GI Tract	0.065	-----	0.0058	0.071
			Manganese	CNS	0.085	-----	0.0048	0.09
							Groundwater Hazard Index Total =	0.2

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Chloroform	Liver	0.0092	0.19	0.00019	0.2
			Chromium	GI Tract	0.15	-----	0.018	0.17
			Manganese	CNS	0.2	-----	0.015	0.21
							Groundwater Hazard Index Total =	0.6

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for all routes of exposure. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects.

APPENDIX IV
Responsiveness Summary

RESPONSIVENESS SUMMARY
VEGA BAJA SOLID WASTE DISPOSAL SITE
OPERABLE UNIT ONE - GROUNDWATER

Comment #1. Commenters asked which were the three properties that the Environmental Protection Agency cleaned up and what criteria were used to select them?

Response. EPA conducted, a time-critical removal action involving three parcels at the Site located at 5569 Alturas Street; 5571 Alturas Street and 5460 Los Angeles Street. In 1998, EPA sampled and analyzed a total of 3,693 soil samples at the Site. (See Vega Baja April 2004 Record of Decision, page 4). The average soil lead concentration on each residential lot was calculated and evaluated. As a result of the analytical data from residential surface soil sampling and a recommendation of the Agency for Toxic Substances and Disease Registry, EPA determined that the Three Lots warranted an immediate removal action and thirty-nine others required further evaluation because of potential lead contamination.

Comment #2. Can the groundwater quality be improved by constructing a sewer system in this community?

Response: A sewer system is used to convey wastewater from a source to a treatment facility where the wastewater is treated and properly discharged. The community of Brisas del Rosario does not have a municipal sewer system; each residence has a septic tank to accumulate, process, and discharge wastewater to the ground. During the groundwater investigation, there was no evidence of any organic compounds exceeding groundwater quality standards; therefore, it was concluded that the septic tank systems at the Site do not affect the quality of the groundwater.

Comment #3. Are the septic tanks a threat to the groundwater?

Coliform is the most likely threat to the groundwater from septic tanks used in a residential community. The Puerto Rico Department of Health samples the Puerto Rico Acqueduct and Sewer Authority's wells for this contaminant. Also as previously indicated, the Remedial Investigation indicates that there is no evidence of any organic compounds exceeding groundwater quality standards. Consequently, the septic tank systems at the Site are not believed to affect the quality of the Site groundwater.

Comment #4. Which are the thirty-nine lots that are contaminated with lead?

Response: Please refer to Lockheed Martin, 2000, Final Report, Assessment of Lead Contamination, Vega Baja Solid Waste Disposal Site, Vega Baja, Puerto Rico. A copy of the referred document can be found in the EPA Administrative Record, a repository of which is located at the Vega Baja Municipal Library.

Comment #5. Is all of this information available at the public library?

Response: Yes. All of the information related to the Site is available at the Vega Baja Municipal Library as well as at the EPA Caribbean Environmental Protection Division's office in San Juan and at the U.S. EPA Region 2' s office in New York.

Comment #6. When do you think the Site is going to be cleaned up?

Response: EPA is working with the Potentially Responsible Parties (PRPs) to complete the soil remedial investigation and feasibility study (RI/FS). However, there is not a specific date for completion. A site cleanup involves a series of steps, including feasibility studies, cleanup design, and negotiations with the PRPs.

Comment #7. Are the thirty-nine lots the extent of the Superfund Site?

Response: No. The Site includes a 55-acre residential area and the 17-acre undeveloped area as depicted in Figure 2 of the ROD. The 39 lots were identified during the removal assessment as lots with potential lead contamination and will, along with the rest of the Site require further evaluation as part of the soil RI/FS.

Comment #8. What is the level of arsenic in the groundwater?

Response: The level of arsenic in the groundwater ranges from non-detect to 3.4 ppb.

Comment #9. What can EPA can to assist the residents of the Community of Brisas del Rosario to obtain titles to their property?

Response: EPA does not have the authority under the Superfund law to interfere with Commonwealth law or policies dealing with property title matters. The Superfund law does not require the Commonwealth to provide residents with property deeds or titles. This is an inherent function of the Commonwealth government. In this case, the Puerto Rico Housing Department is the Commonwealth agency responsible for evaluating and determining the issuance of a property title.