
APPENDIX H – HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW) REPORT

for

RIO GUAYANILLA, GUAYANILLA, PR 2018 SUPPLEMENTAL APPROPRIATIONS FLOOD RISK MANAGEMENT STUDY



March 2020



US Army Corps
of Engineers®
Chicago District

Rio Guyanilla, Guayanilla, PR
Flood Risk Management Study

USACE. 2020. Rio Guayanilla, Guayanilla, PR Flood Risk Management Study. Draft Integrated Feasibility Report Environmental Assessment. U.S. Army Corps of Engineers, Chicago District, 231 S. LaSalle Street, Suite 1500, Chicago, Illinois 60604. March 2020.

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HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)
PHASE I ENVIRONMENTAL SITE ASSESSMENT
RIO GUAYANILLA FLOOD RISK MANAGEMENT STUDY

Hydraulics and Environmental Engineering Section (TSD-HE)
US Army Corps of Engineers, Chicago District

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INTRODUCTION

The purpose of this report is to discuss the hazardous, toxic, and radioactive waste (HTRW) assessments for the proposed project areas identified in the Rio Guayanilla, Puerto Rico FRM Feasibility Report and Integrated Environmental Assessment. This HTRW investigation identifies both HTRW and non-HTRW environmental issues, and presents appropriate measures to resolve these issues. The methods used in performing the investigation are described in detail. Conclusions and recommendations regarding potential impacts due to HTRW and non-HTRW issues associated with project sites are provided.

AUTHORITY

Engineer Regulation (ER) 1165-2-132, Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works projects, requires that a site investigation be conducted as early as possible to identify and evaluate potential HTRW problems. According to ER 1165-2-132, non-HTRW issues that do not comply with the federal, state, and local regulations should be discussed in the HTRW investigation along with HTRW issues.

This HTRW investigation presented was conducted during the feasibility phase of the project. The investigation relies on existing information, observations made through database research, an aerial photograph, topographic map, and historical document review, a site visit, and information provided by the local sponsor. As stated in the ER-1165-2-132 an initial assessment as appropriate for Reconnaissance Study should be conducted as a first priority for projects with no prior HTRW consideration. If the initial assessment indicated the potential for HTRW, testing, as warranted, and analysis similar to a Feasibility Study, or Phase II Environmental Site Assessment (ESA), should be conducted prior to proceeding with the project design.

DEFINITIONS

Hazardous, Toxic, and Radioactive Waste

The objective of ER 1165-2-132 is to outline procedures to facilitate early identification and appropriate consideration of HTRW. This investigation, therefore, identifies potential HTRW and discusses resolutions and/or provides recommendations regarding the HTRW identified.

Non-Hazardous, Toxic, and Radioactive Waste

According to ER 1165-2-132, non-HTRW environmental issues that do not comply with federal, state, and local regulations should be discussed in the HTRW investigation along with HTRW. For example, solid waste is a non-HTRW issue considered. Petroleum

releases from Leaking Underground Storage Tanks (LUSTs) are not considered HTRW, but are regulated. These sites have the potential to impose environmental hazards. Non-HTRW issues identified during the investigation are also discussed in this report, along with resolutions and/or recommendations for resolution.

Recognized Environmental Condition

For the purposes of this investigation, the term REC may be used interchangeably with HTRW to identify a potential HTRW or non-HTRW environmental issue. ASTM defines a recognized environmental condition (REC) as the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions.

GUIDANCE

Supplemental guidance was provided by the Standard Practice for Environmental Assessments: Phase I Environmental Site Assessment Process (Designation: E 1527-13) prepared by the American Society for Testing of Materials (ASTM). The purpose of this guidance is to define good commercial and customary practice in the United States of America for conducting an environmental site assessment of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. §9601) and petroleum products. These standards recommend that an environmental assessment include a records review, site visit, interviews, and report preparation.

LAWS AND REGULATIONS

Federal

The definition of HTRW according to ER 1165-2-132, page 1, paragraph 4(a) is as follows: “Except for dredged material and sediments beneath navigable waters proposed for dredging, for purposes of this guidance, HTRW includes any material listed as ‘hazardous substance’ under the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601 et seq (CERCLA). (See 42 U.S.C. 9601(14).) Hazardous substances regulated under CERCLA include ‘hazardous wastes’ under Sec. 3001 of the Resource Conservation and Recovery Act, 42 U.S.C. 6921 et seq; ‘hazardous substances’ identified under Section 311 of the Clean Air Act, 33 U.S.C. 1321, ‘toxic pollutants’ designated under Section 307 of the Clean Water Act, 33 U.S.C. 1317, ‘hazardous air pollutants’ designated under Section 112 of the Clean Air Act 42 U.S.C. 7412; and ‘imminently hazardous chemical substances or mixtures’ on which EPA has taken action under Section 7 of the Toxic Substance Control Act, 15 U.S.C. 2606; these do not include petroleum or natural gas unless already included in the above categories. (See 42 U.S.C. 9601(14).)”

As noted in 42 U.S.C. 9601(14), the term “hazardous substance” does not include crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance, nor does the term include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel. Underground storage tanks (USTs) are federally regulated under 40 CFR Part 280, which includes technical standards and corrective action requirements for owners and operators of USTs.

Commonwealth

The Commonwealth of Puerto Rico regulations were examined to determine which regulations governed the state specific hazardous waste disposal, release, and cleanup requirements. Puerto Rico has primary responsibility for enforcing its UST program, although EPA retains the authority to exercise its corrective action, inspection and enforcement authorities under RCRA. The set of rules known as the Regulation for the Control of Underground Storage Tanks, Number 4362, promulgated in accordance with Act No. 416 of September 22, 2004, as amended, constitute the rules of the Environmental Quality Board (EQB) of the Commonwealth of Puerto Rico for installations with Underground Storage Tank Systems (UST Systems). The UST regulation defines a regulated substance as “Petroleum and petroleum-based substances comprised of a complex blend of hydrocarbons, such as motor fuels, jet fuel, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils and any substance defined in CERCLA; and petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure, 60 degrees Fahrenheit and 14.7 pounds per square inch absolute.” An UST System for hazardous substances is defined as an “UST System that contains a hazardous substance defined in CERCLA, does not include: any substance regulated as a hazardous waste under RCRA or any mixture of such substances and petroleum.” Petroleum UST System means “An UST System that contains petroleum or a mixture of petroleum with minimus quantities of other regulated substances. Such systems include those containing motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.”

Owners and operators of petroleum or hazardous substance UST systems must comply with the requirements of Regulation No. 4362 except for USTs excluded under Rule 803 (b), including UST systems holding hazardous wastes or identified under RCRA, or a mixture of such hazardous waste and other regulated substances. Puerto Rico does not have an authorized hazardous waste program, thus USEPA is responsible for enforcing federal regulations in Puerto Rico. Regulations governing hazardous waste identification, classification, generation, management and disposal are found in title 40 CFR parts 260 through 273.

STUDY DESCRIPTION

The Guayanilla River watershed, shown in Figure 1, drains approximately 37 square miles in the Municipality of Guayanilla, Puerto Rico. Heavy rainfall combined with very steep slopes in the upper catchment can produce high peak discharges in a relatively short

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The focused study area includes the lower Guayanilla River floodplain (including the Town of Guayanilla), agricultural fields and portions of the mountains to the west, and to a lesser degree, the marine/estuarine coastline of Guayanilla Bay (Figure 2).

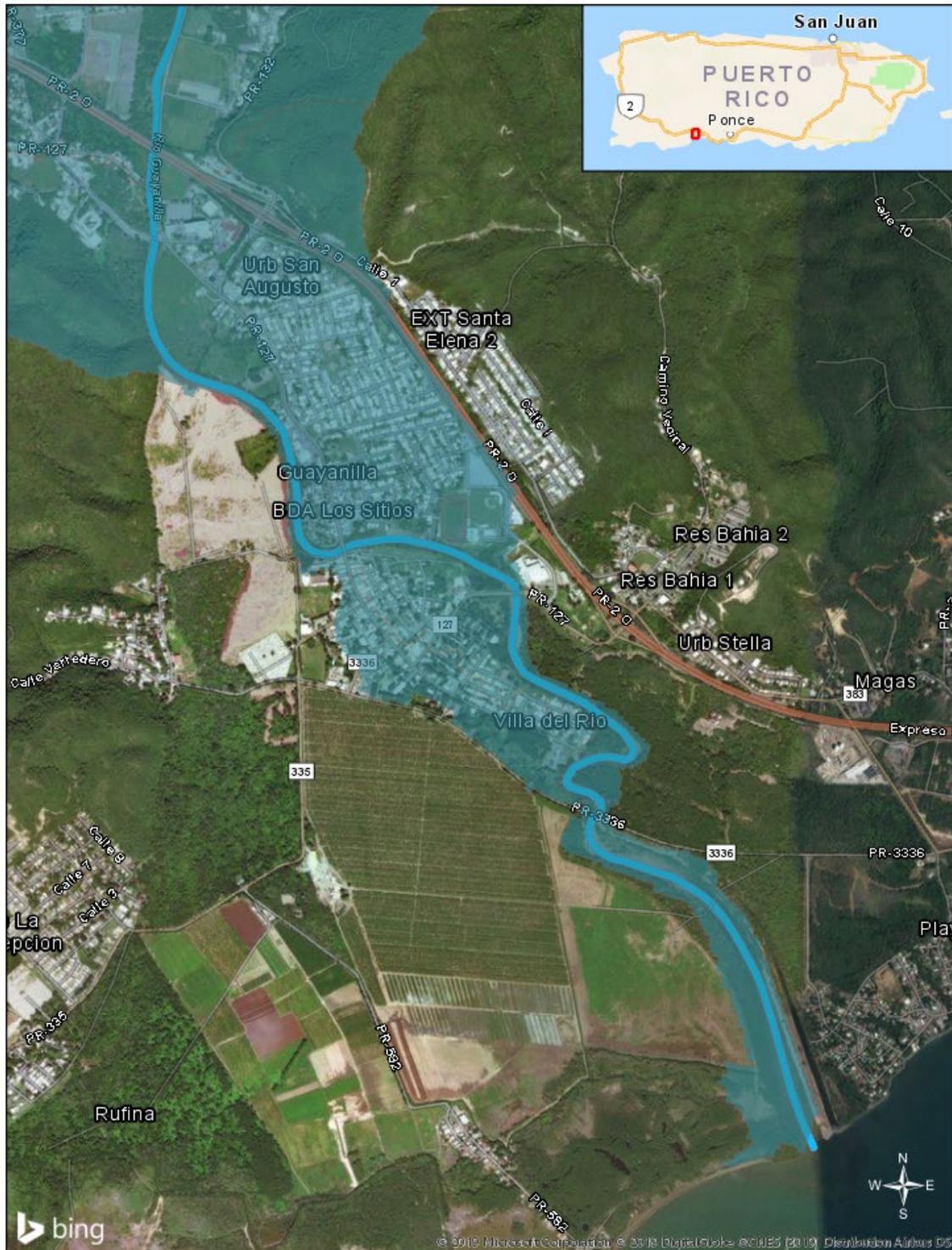


Figure 2. Focused Study Area with Guayanilla River and Watershed.

The Rio Guayanilla Feasibility Study documents the planning process used to evaluate flooding along the Guayanilla River and develop a range of possible structural and non-structural alternatives to address flood risks. While multiple projects were investigated by the project delivery team, not all were economically justified for implementation. Only the alternative with highest potential for implementation was evaluated using the Phase I ESA approach. The plan formulation process utilized the best available information throughout feasibility phase to identify the Recommended Plan as the alternative with the highest net National Economic Development (NED) benefits.

PROJECT DESCRIPTION

Diversion Channel South with Single Line of Protection

The Recommended Plan is Alternative #3: Diversion Channel South with Single Line Protection (Figure 3). This alternative would construct an engineered diversion channel at the beginning of the coastal plain of the Guayanilla River (approximately at PR-2) to direct flood waters away from the town. The length of the channel is approximately 9,000 feet long running along the confining mountain valley wall to the west through agricultural fields, where it bends east through banana fields. The diversion channel rejoins the river near PR-3336, where Phase I of Guayanilla River Flood Control Channelization Project was completed in 2006 (see main report for description of channelization project). A robust diversion structure would be set in place across the river channel to split flows, sending all flood waters to the diversion channel, but keeping almost bank-full flows to the Guayanilla River to maintain ephemeral riverine ecology and connectivity for sediment transport and fish passage. The diversion channel itself would be an engineered trapezoidal construction with a bottom width of 100-feet and 2:1 side slopes. The channel would have concrete, gabion, sheet-pile, and/or riprap at select points in the channel where hydraulic models indicate incision or meandering potential exists. This alternative would have levees on the east side (town side) of the new diversion channel. The west side of the channel would be graded to certain elevations to ensure waters stay within the designated flowage. As a conservation measure to provide overland flow of freshwater and sediment through the mangrove coastal zone between the Rio Guayanilla and the neighborhood of El Faro, the western diversion channel berm at the Phase I project would be truncated and a small set-back levee built to protect El Faro.

Material from the excavated channel would be predominantly gravel and sand, which is not suitable for levee construction. Areas alongside the diversion channel have been designated for disposal (Figure 3) so all material excavated for the diversion channel can be managed on-site rather than disposed of at a distant facility. Beneficial reuse of potentially suitable material has also been proposed for concrete components, wetland and ecosystem restoration, as landfill cover used by municipalities of Ponce and/or Peñuelas, or as a sellable commodity for potential contractors.

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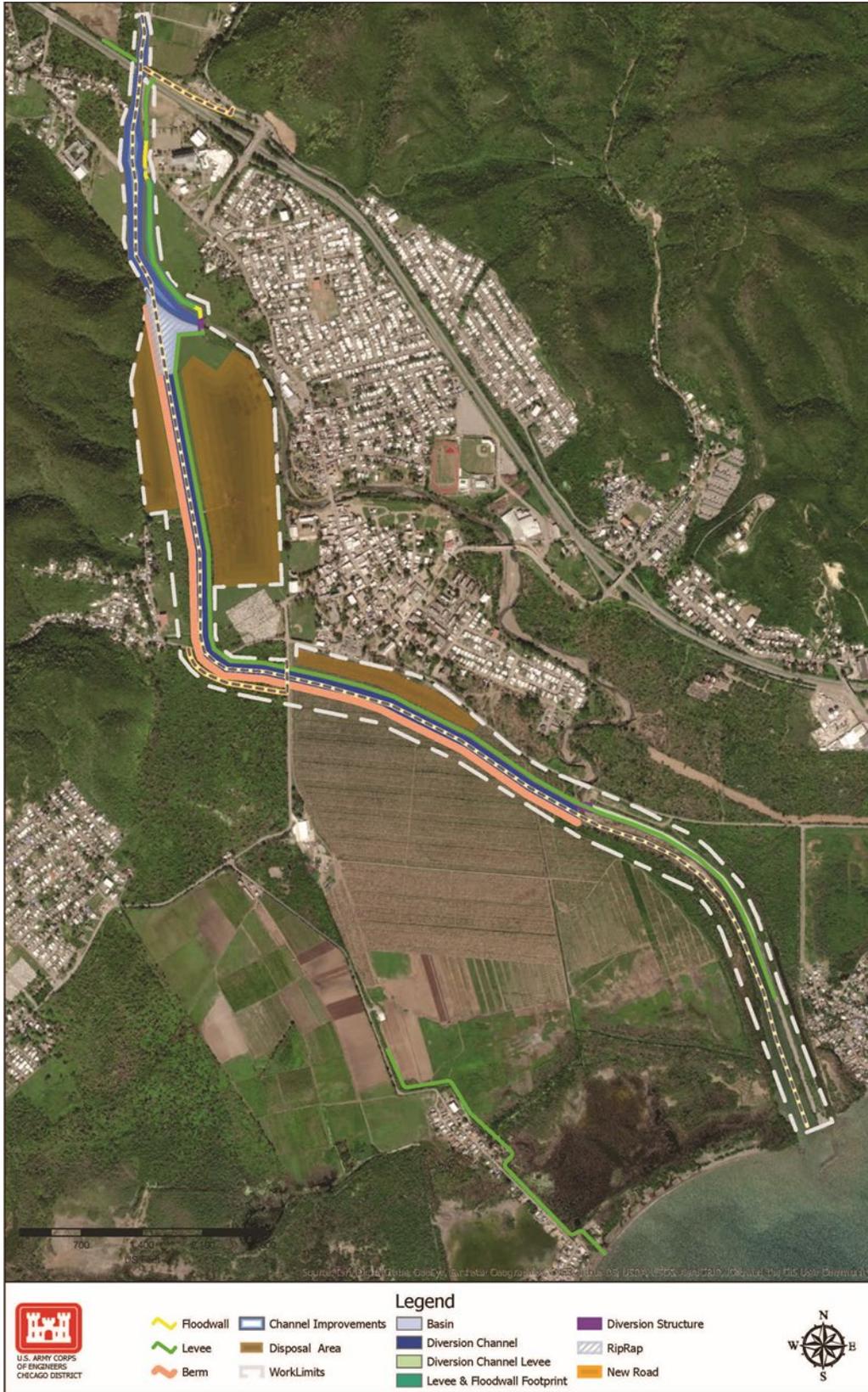


Figure 3. Alternative 3 Diversion Channel South w/ Single Line Protection Project Area.

The levees would be constructed of commercially sourced clay and rock. Originally USACE determined that the only cost efficient source of stone for the project would be to mine the karst forest mountains to the west of the project for limestone, despite associated impacts to geology, soils, hydrology, T&E species, and forest communities. However a high potential suitable abandoned rock quarry was located by the USFWS (Figure 4) as a preferred mining location.

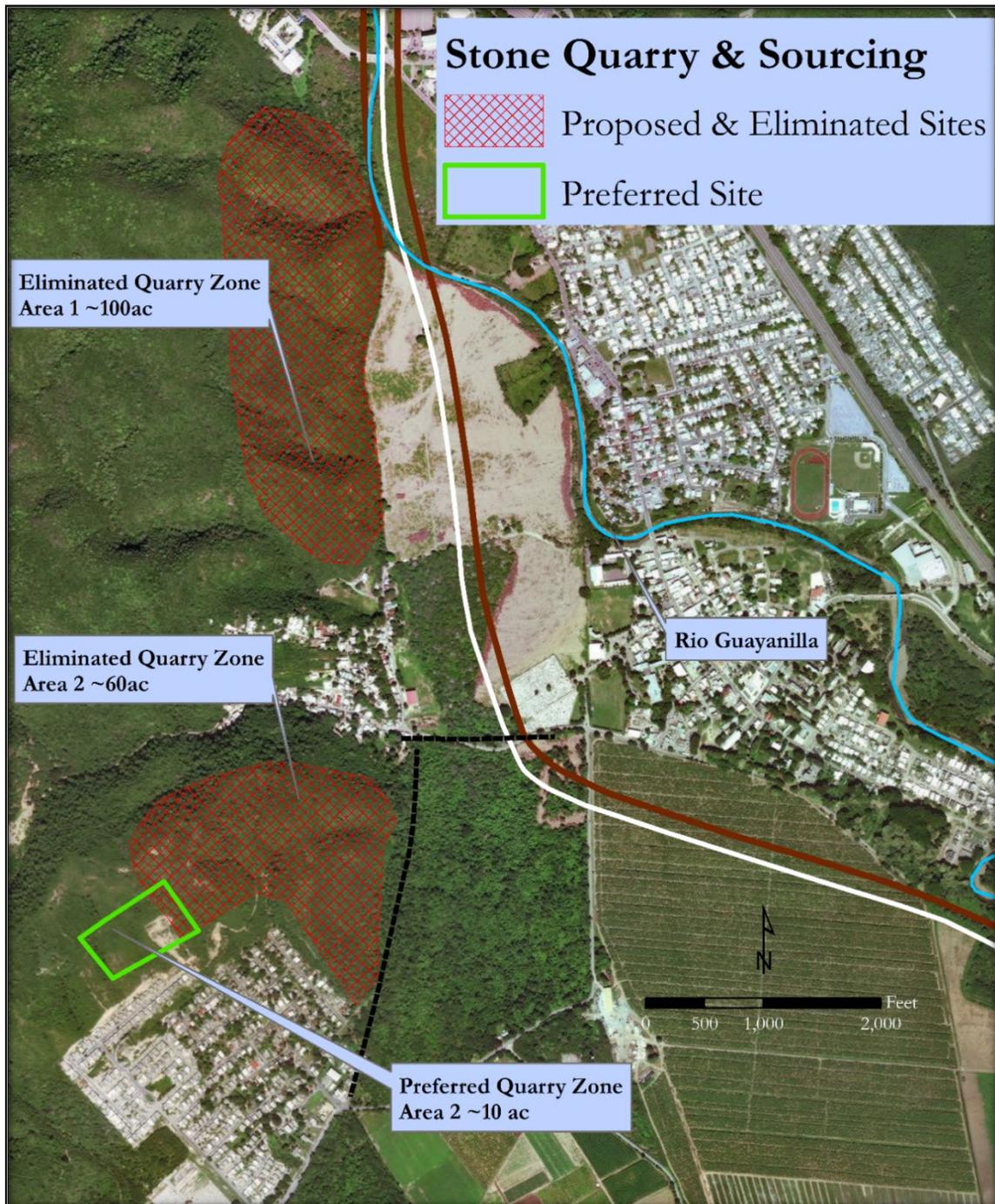


Figure 4. Quarries & Sourcing for Levees and Concrete Limestone Aggregates

PHASE I ESA GENERAL METHODS

The following sections contain information that was requested and gathered in accordance with ER 1165-2-132 for this assessment. The information was obtained from:

- Existing information review
- Historical topographic map and aerial photograph review
- Database research
- Site visit

This information was used to determine if the measures proposed for flood risk management at the Rio Guayanilla Flood Risk Reduction project area will have an impact on any environmental conditions that may exist in the surrounding areas, and if there are environmental conditions on project sites that will have an impact on implementation of the projects.

EXISTING INFORMATION REVIEW

Soils

Soils in the Rio Guayanilla basin (Figure 5) consist of alluvial deposits of sand, clay, and talus in the floodplain; and limestone overlain by strata of clay, slates and sands in the mountain slopes. Closer to the coast, there is a thick highly compressible, organic clayey silt/silty clay layer overlying a stiff to very stiff clayey silt/silty clay.

The dominant soil types found in the diversion channel project area are Constancia Silty Clay (Ct) and San Anton Clay Loam (Sa). The Ct series consists of very deep, somewhat poorly drained, slowly permeable soils in riverine floodplains. They formed in calcareous fine-textured sediments derived from volcanic and limestone rocks. Most areas of Ct soils are used for cropland and pasture land. The San Anton series consists of very deep, well drained, moderately permeable soils on alluvial fans and floodplains. They formed in stratified alluvial deposits that weathered from volcanic rock and limestone. San Anton soils are used for pasture and for growing Sugar Cane, Plantains (*Musa* spp. cultivars) and other crops.

The environmental soil quality at the project site is largely unknown. Based on land-use, fertilizer and pesticide residues are likely in the soil at the plantation site. Not far from the Town of Guayanilla, soils may also contain background de minimis concentrations of PAHs and metals similar to soils found in a rural area near an urban development.

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Review of the Puerto Rico Integrated Water Quality Report for the 2018/2019 water year indicates the Guayanilla River and Guayanilla Bay are 303(d) listed impaired waterways. The impairments in Table 1 are noted in the study area:

Table 1. 2018 Guayanilla River and Guayanilla Bay 303(d) listed pollutants.

Water body (river/coast length)	Designated Uses	Impairments	TMDL Development Priority (projected submittal date)	Sources
Guayanilla River / Rio Guayanilla (60 miles)	Contact and non-contact water recreation (REC-1, REC-2), preservation and propagation of aquatic life including T&E species (AL), drinking water supply (DW)	Ammonia	High	Agriculture, Collection System Failure, Landfills, Minor Industrial Point Source, Minor Municipal Point Source, Onsite Wastewater Treatment Systems, Urban Runoff/Storm Sewers
		Enterococci	High	
		Fecal Coliform	Already Established (Approved September 2012)	
		Low Dissolved Oxygen	High	
		Total Nitrogen	High (2019)	
		Total Phosphorus	High (2019)	
Guayanilla Bay / Punta Guayanilla to Punta Verraco (13.20 miles)	Contact and non-contact water recreation (REC-1, REC-2), preservation and propagation of aquatic life including T&E species (AL)	Copper	*	Major Municipal Point Sources, Marinas and Recreational Boating, Onsite Wastewater Systems, Upstream Impoundment, Urban Runoff/Storm Sewers
		Enterococci	*	
		Oil and Grease	*	
		pH	*	
		Thermal Modification	*	
		Turbidity	*	

*Not in rankings.

Air Quality

The Municipality of Guayanilla has been in attainment of National Ambient Air Quality Standards (NAAQS) since at least 1992. There is one PREQB monitoring station in Guayanilla which measures PM_{2.5} (particulate matter with diameter less than 2.5 um) concentrations, demonstrating the air quality of Guayanilla is within the parameters established by the primary national standard for PM_{2.5}. Atmospheric sulfur dioxide concentrations in parts of Guayanilla were shown to approach, but not exceed, the primary sulfur dioxide NAAQS from Puerto Rico Electric Power Authority (PREPA) South Coast Plant emissions in southeast Guayanilla County.

HISTORICAL TOPOGRAPHIC MAP AND AERIAL PHOTOGRAPH REVIEW

Indications of potential RECs can be determined by identifying the past land use and site activities at the project area and surrounding areas. Identifying industrial and residential areas, observing any evidence of topographic changes, and locating extensive areas that lack vegetation can determine indications of a potential REC.

A series of historical topographic maps between 1946 and 2013 were reviewed for the Rio Guayanilla Flood Risk Management project area. Findings are presented in Table 2. Historical topographic maps for the project areas are included in Attachment 1.

Table 2. Summary of Topographic Map Review

1946 Topographic Map	Steep topography of the karst mountains are seen on either side of the Guayanilla River alluvial valley. The Guayanilla River is similar to its current configuration, bisecting the small Town of Guayanilla and generally flowing south to Guayanilla Bay. A town cemetery is visible, as is a small developed area of Central Rufina south of town, and wetlands along the bay further south. Major roadways and rail line are constructed. Other waterways exist in the agricultural area west and southwest of the river.
1952 Topographic Map	No major changes appear in the project area between 1946 and 1952, except for two new road/path extensions in the fields west of the river and north of the cemetery, and a few buildings dotting the fields along the roads. The town of Playa de Guayanilla is also visible east of the river on the bay.
1958 Topographic Map	Between 1952 and 1958, the northern portion of Guayanilla doubles in size. A new road connects Piedras Blancas with the town, and a power transmission line appears from the town to the mountains to the west.
1966 Topographic Map	Between 1958 and 1966 Guayanilla expands in size again, and a new Highway 2 (PR-2) is under development from the east. A wastewater treatment plant is located south of town at a bend in the river. New ponds are visible around Central Rufina.

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1982 Topographic Maps	Significant changes in the area occur between 1966 and 1982. Guayanilla expands, and PR-2 is completed north of town. The neighborhood of Sector Beldum develops at the base of the mountains between Piedras Blancas and Los Indios. Industry has established east of the river on Hwy 2. Central Rufina however appears less developed.
2013 Topographic Maps	Few changes in the project area between 1982 and 2013. Simpler map, without rail, transmission line, or structures shown. Similar road network as prior maps. Drainage ways west and southwest of the river still apparent.

A series of historical aerial photographs were reviewed between 1962 and 2012. Findings from review of aerials are included in Table 3. Because the aerial photographs were collected from the center of the project area, not all photos described capture changes to the extreme northern and southern portions of the project area. Historical aerial photographs for the project area are included in Attachment 2.

Table 3. Summary of Historical Aerial Photograph Review

1962 Aerial Photo (shows only the lower half of the project area)	This aerial shows the ‘Rufina’ neighborhood in the lower portion of the project area only. Agricultural fields and a cluster of farm buildings south of the Town of Guayanilla and west of the Guayanilla River are clearly visible.
1972 Aerial Photo	By 1972, major roadways are constructed and the Town of Guayanilla appears to be expanding. The Guayanilla River appears in its current configuration. Well-delineated fields still dominate the alluvial valley between forested mountains to the west and the town and the river to the north and east.
1977 Aerial Photo	Between 1972 and 1977, the Town of Guayanilla is built nearly to its current extent. Sector Beldum develops at the base of the mountain just west of Central Rufina between Piedras Blancas and Los Indios.
1983 Aerial Photo	Between 1977 and 1983, a hotel and convention center appears east of the river and south of PR-2 at the northernmost portion of the project site. The color-infrared photograph distinguishes between natural landscape features, including productive mountain forests, fields with varying vegetation density, and fields of wet and/or organic soil without vegetation.
1993 Aerial Photo	Between 1983 and 1993, no significant changes in the project area. Small buildings in field north of cemetery and west of river are somewhat more apparent (this was confirmed in 2019 CNES/Airbus aerial photography through GoogleEarth).

Review of historical topographic maps and aerial photographs suggest the project area was primarily undeveloped and used for agricultural purposes. Adjacent properties are a combination of rural/agricultural, urban residential/commercial, mountains, and river. Heavy industry exists east of the Guayanilla River, which is outside of the project area.

A number of roads (primarily Calle 3 along the river at the northernmost portion of the project site, Calle Vertedero near Piedras Blancas, and PR-335) and furrows or drainage ways for agriculture intersect the project site. The only buildings in the project area appear to be small structures in the fields north of the cemetery. It is not possible without a visual site inspection to see if hazardous substances were being used or stored in these buildings. It is very likely that fertilizers and/or pesticides have been used in agricultural fields that make up the majority of the project site. Soils may contain *de minimis* concentrations of PAHs and metals due to proximity to the developed Town of Guayanilla, particularly near roadways.

DATABASE SEARCH

A search of available environmental records was conducted utilizing Environmental Database Resources, Inc. (EDR). EDR searched federal and state databases using the minimum search distances issued in the ASTM E 1527-13 guidelines (Table 4).

Table 4. Minimum Search Distance for Federal and State Databases

Database	Approximate Minimum Search Distance (mi)
Federal NPL Site List	1.0
Federal CERCLIS List	0.5
Federal CERCLIS NFRAP site list	Property and Adjoining Properties
Federal RCRA CORRACTS Facilities List	1.0
Federal RCRA non-CORRACTS TSD Facilities List	0.5
Federal RCRA Generators List	Property and Adjoining Properties
Federal ERNS List	Property Only
State Equivalent NPL	1.0
State Equivalent CERCLIS	0.5
State Landfill/Solid Waste Disposal Site Lists	0.5
State LUST Lists	0.5
State registered UST List	Property and Adjoining Properties

Federal and State Databases

About 72 Federal, State, Local, and Other databases were searched. Database descriptions are provided here if referenced in Table 3 or returned results during records search:

CERCLIS

The Comprehensive Environmental Response, Compensation, and Liability, Information System (CERCLIS) contains data on any potential hazardous waste site that has been reported by states, municipalities, private companies, or private persons pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The CERCLIS database indicates the stages of evaluation and remediation that have been completed for any given site. The CERCLIS database includes the National Priority List (NPL), which identifies over 1,200 sites for priority cleanup under the Superfund program, and the CERCLIS-No Further Remedial Action Planned (NFRAP) List, which includes a listing of sites that have been removed from CERCLIS. The CERCLIS list was renamed to Superfund Enterprise Management System (SEMS) and CERCLIS-NFRAP was renamed to SEMS ARCHIVE by the EPA in 2015.

PRP

PRP is a listing of verified Potentially Responsible Parties.

RCRIS

The Resource Conservation and Recovery Information System (RCRIS) lists sites which generate, transport, store, and/or dispose of hazardous waste defined by the Resource Conservation and Recovery Act (RCRA). The RCRIS database includes RCRA Corrective Action Report (CORRACTS), which identify hazardous waste handlers with RCRA corrective action activity; RCRA treatment, storage, and disposal facilities (TSDFs), and RCRA conditionally exempt small quantity generators (CESQGs), RCRA small quantity generators (SQGs), and large quantity generators (LQGs) facilities.

RAATS

RCRA Administrative Enforcement Actions Tracking System information is now contained in the RCRIS database and contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued.

2020 COR ACTION

The 2020 Corrective Action Program List (2020 COR ACTION) includes a wide variety of facilities expected to need corrective action. Inclusion in the list does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

RCRA NonGen / NLR

RCRAInfo is EPA's comprehensive information system lists RCRA Non Generator / No Longer Regulated (RCRA NonGen / NLR) sites that do not presently generate hazardous waste.

ERNS

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

SHWS

Puerto Rico does not maintain a State Hazardous Waste Sites (SHWS) list. See the Federal CERCLIS list and Federal NPL list.

LUST/UST

The PR Environmental Quality Board maintains a listing of registered underground storage tanks (UST) and a listing of leaking underground storage tank reports (LUST).

US BROWNFIELDS

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. The EPA lists Brownfields properties from the Cleanups in My Community program (US BROWNFIELDS) which provides information on local Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

FINDS

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: RCRIS, PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA [Toxic Substances Control Act] Enforcement System, FTTS [FIFRA/TSCA Tracking System]), CIRCLIS, DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), FRDS (Federal Reporting Data System), SIA (Surface Impoundments), CICS (TSCA Chemicals in Commerce Information System), PADS (PCB Activity Data System), RCRA-J (medical waste transporters/disposers), TRIS (Toxic Release Inventory System), and TSCA. The source of this database is the US EPA/NTIS.

ECHO

Environmental Compliance and History Online database providing integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

EDR Hist Auto

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. EDR classifies this database in "High Risk Historical Records" that presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

ICIS

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

TRIS

Toxic Chemical Release Inventory System (TRIS) identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

RMP

Risk Management Program (RMP) Rule implements Section 112(r) of the Clean Air Act Amendments of 1990 requiring facilities using extremely hazardous, toxic, flammable substances to develop a program for accident prevention and emergency response.

Project Site

EDR was unable to generate a custom Corridor Report for the entire project site due to its location outside the continental US. Therefore four Radius Map Reports were provided with smaller target area units that cover the project area sufficiently to obtain database returns in excess of Table 3. Listed facilities on, adjacent to, or within ½ mile up to 1.0 mile (NPL, RCRA CORRACTS) of the project area are reviewed as part of this report. Table 5 compiles returns from all EDR database reports with actual distances determined from project boundaries using GoogleEarth. Analysis of information, status of the sites, and a summary of potential project impacts are also included. Any sites that appear to be located incorrectly are noted. Twenty 'orphans' (sites not mapped due to poor or inadequate address information) were returned; after review of address/municipality information only two met minimum search distances and are included in Table 5. The EDR overview maps displaying the radius report target areas and search results are given in Figures 6, 7, 8, and 9. The EDR database reports are provided in Attachments 3, 4, 5, and 6.

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Table 5. EDR Search Results

Database	Map ID - EDR Report	Site Name	Proximity to Site/work limits*	Status	Potential Impact
FINDS ECHO	1 - Mid Report 5488614.26s	Dept of Ed – Francisco Rodriguez Lopez	<1/8 mile, east of river	Online search confirmed a RCRA Handler ID with a status of Inactive, therefore facility not likely managing hazardous waste. No violations identified.	No known storage, disposal, or release of hazardous material on the site. No anticipated impacts to project site.
ICIS	2 - Mid Report 5488614.26s	#844 - Guayanilla	<1/8 mile, east of river	A civil enforcement action was taken against this service station. Additional online queries revealed this was a RCRA-UST case involving a hundred facilities failing to meet UST leak detection and maintenance requirements. It appears the facility has implemented injunction relief, but not supplemental environmental projects involved in the settlement.	Potential for petroleum release exists, although none has been confirmed. Verify REC status during future site reconnaissance or interviews with property owner if possible. Construction unlikely to impact UST, since not on or adjacent to project area.
EDR HIST AUTO	3 - Mid Report 5488614.26s	Santa Elena Gas	1/8 mile north and east	Facility is recorded as a gasoline service station from 2005 – 2014. No additional information is provided for the site.	Likely UST site, though no further documentation found. This site is not on or adjacent to the project area. Due to proximity, construction is not likely to impact the site.
ECHO FINDS	A4/A5 - Mid Report 5488614.26s	Municipality of Guayanilla	1/8 mile north	MS4 facility discharging stormwater to Guayanilla River. General NPDES Permit status pending. Compliance information not available.	NPDES permitted discharge to surface water pending, with no known violations at this time. No uncontrolled release, so impacts to project not likely.

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ECHO FINDS ICIS	B6/B7 - Mid Report 5488614.26s	Drillex, S.E.	<i>3/8 mile east</i>	A civil judicial enforcement action was taken against Drillex for Tren Urbano Project. Additional queries conducted online revealed this was a CAA case involving violations of the requirements of the asbestos NESHAP. Drillex S.E. address and online search both locate the facility in Dorado, PR. Furthermore, Tren Urbano Project serves the San Juan region.	This site appears to be mis-mapped to Guayanilla, PR. Confirm by inspecting EDR mapped location during future site visit if possible. No impacts to the project area or project implementation anticipated.
ECHO FINDS RCRA NONGEN/NLR	8 - Mid Report 5488614.26s	Shell Co PR LTD SS 804118 Guayanilla	<i>1/8 mile north</i>	Online search confirmed a RCRA Handler ID with a status of Inactive. Historic small quantity generator of hazardous waste, but currently a non-generator. No violations identified.	Likely UST site that historically generated hazardous waste. No known releases. Since not on or adjacent to project area, site is unlikely to impact construction.
SEMS PRP RCRA NONGEN/NLR	1 - Lower West Report 5488614.42s 9 - Mid Report 5488614.26s	Tropical Fruit Co S E	<i>1/4 mile south (fields on project site)</i>	Tropical fruit farm ordered under CERCLA to cease high-pressure application of pesticides containing hazardous substances drifting to neighboring community in 1996-1997. Also cited for violation of worker protection standards and use of unregistered pesticides under FIFRA. Media affected was air. Actions against Tropical Fruit Co resolved with consent decree. Consent decree modified	The project area runs through banana fields farmed by Tropical Fruit Co. Pesticides were used by the farm in an uncontrolled manner to air. Impact of pesticide released to soil, groundwater, and surface water is unknown. Aerial review and site visit confirmed continued farming, so there is likely to be residual levels of pesticides and fertilizers in the soil. If possible, confirm the use

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				application practices to minimize hazards.	of these substances on project area fields during future site visit or property owner interview. Phase II ESA advised if excess soil were being taken off-site, however material is being managed on-site. Do not expect additional impacts from this REC to project implementation.
<p>FINDS</p> <p>US BROWNFIELDS</p> <p>*</p> <p>CORRACTS</p> <p>2020 COR ACTION</p> <p>RCRA-TSDF</p> <p>RCRA NonGen / NLR</p> <p>RAATS</p>	<p>2 - Lower West Report 5488614.42s</p> <p>7 - Lower East Report 5488614.34s</p> <p>10 - Mid Report 5488614.26s</p> <p>*</p> <p>Orphan - Upper Report 5488614.18s; Mid Report 5488614.26s</p>	<p>Haz106-Rico Chemicals Corporation</p> <p>*</p> <p>Rica Chemical Corporation</p>	<p><i>3/8 mile northeast</i></p>	<p>Brownfields site is a former PVC manufacturing plant currently undergoing Phase I ESA. Waste was incinerated on-site. Mercury contaminated soils were removed June 1999 resulting in clean closure under RCRA. Appears that contamination was contained in 1999 through EPA's RCRA program. Unknown if (further) cleanup is required at this property.</p> <p>*</p> <p>Facility historically handled hazardous waste and was subject to RCRA administrative and corrective actions. Human exposures and migration of contaminated groundwater were determined to be under control in</p>	<p>Rica Chemical Corp orphan site is the same site as Haz106-Rico Chemicals Corporation brownfield site based on same property address and similar site history. Results of Phase I ESA and the cleanup solution are not known from existing information. Additional information may be obtained from future interview with site owner. Though near the Guayanilla River, inspection of the watershed map places this and most sites east of the river outside of its watershed. Because the location is not in or adjacent to the project area, no impacts to project implementation are anticipated from this REC.</p>

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				2009 and 1999, respectively. Cleanup assessment, investigation, and solution selection occurred throughout the 1990s. Solution implemented in 2015.	
FINDS	Orphan - Upper Report 5488614.18s; Mid Report 5488614.26s; Lower East Report 5488614.34s	Guayanilla River Unauthorized Channelization	<i>1/8 mile northeast, on river</i>	The listing for this enforcement/compliance activity was created in 2010. Additional query into a USACE regulatory database identified an enforcement action taken by EPA in 2009 for channelization of 300-400 meters of Guayanilla River south of PR-127 for flood control.	The description of channelization activity in the regulatory database was ‘displacing materials’ for flood control. There is no indication of a release or discharge of hazardous material for this activity. Because the project area is not adjacent to this section of the river, no impacts to the project are anticipated.
FINDS ECHO TRIS	A1/A5 - Lower East Report 5488614.34s	Master Paints and Chemical Corp.	<i>3/8 mile northeast</i>	This facility releases toxic chemicals (butyl acrylate, ethylene glycol, phthalic anhydride, xylene) to the air, water and land in reportable quantities. Facility also covered under general NPDES permit for stormwater discharges, with recent permit noncompliance due to reporting failures.	Facility manufactures, processes, or uses TRI listed chemicals, however this is regulated under the TRI Program. Stormwater discharges are regulated under the NPDES permit program. Based on distance from project site and location in the coastal drainage watershed east of the river, the facility is not likely to impact the project site.

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ICIS * ECHO FINDS	2 - Lower East Report 5488614.34s * 10 - Lower East Report 5488614.34s	Demaco Corp	<i>1 mile northeast</i> * <i>1/8 mile east</i>	Facility is covered under a major NPDES individual permit for discharges to Guayanilla Bay. There is recent history of permit noncompliance, and history of significant violation/enforcement activity from 2003 to 2006.	The two sites are not mapped near one another, however they have the same address and name. Based on site reconnaissance and aerial photo inspection, the nearest site may be mis-mapped because this is a residential area; or it could possibly be an outfall location. Because the permit designates the watershed as coastal (around the mouth of the Macana River) and receiving waters as Guayanilla Bay, it is unlikely this facility would impact the project area.
US BROWNFIELD FINDS * FINDS ICIS ECHO *	4 - Lower East Report 5488614.34s * C12/C13 - Lower East Report 5488614.34s *	Haz105-PPG Industries+PPG Canal * PPG Industries-Caribe Inc * PPG Industries Caribe	<i>1 mile east</i> * <i>1/8 mile east</i> * <i>1 mile east</i>	Former chemical manufacturing plant now undergoing Phase 1 ESA. Unknown if further cleanup is required at this property. Extensive demolition, removal, and cleanup activities between 1978 and 1984. Received approval of closure plans from EPA in 1984 and subsequent groundwater monitoring indicated residual levels of chlorinated VOCs. In 1990 RCRA Facility Investigation order investigated	All PPG returns determined to be the same site considering similar names, addresses, and history. Based on site reconnaissance and aerial photo inspection, the nearest site may be mis-mapped because this is a residential area; or it could be related to the Western (Playa de Guayanilla) plume location. Because the site is located in the coastal watershed with non-significant impacts to Guayanilla Bay, no impacts to project implementation west of

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SEMS-ARCHIVE CORRACTS RCRA-TSDF RCRA-CESQG US ENG CONTROLS US INST CONTROL 2020 COR ACTION	16 - Lower East Report 5488614.34s			chlorinated VOCs in soils and groundwater and Hg contamination in soil. Hg contaminated soils removed June 1999 resulting in clean closure under RCRA. Two chlorinated VOC plumes delineated: Southeastern (reaching BetterRoads) and Western (reaching Playa de Guayanilla) that partially discharge to Guayanilla Bay. Monitored Natural Attenuation cleanup strategy. Recent sampling data indicate chemical concentrations in Guayanilla Bay are not significant/do not exceed surface water standards. Migration of contaminated groundwater and current human exposures determined to be controlled (September 2005).	the Guayanilla River are expected from this REC.
ECHO ICIS RMP FINDS	B6/B8/B9 - Lower East Report 5488614.34s	Linde Gas	<i>3/8 mile east</i>	Industrial gas manufacturing facility using hazardous substances is required to implement Risk Management Plans for accident prevention and emergency response. RMPs developed for Methylamine and Hydrochloric Acid. An administrative	Facility is required to comply with RMP regulations. Though facility uses hazardous substances, RMP should reduce the likelihood of accidental releases. The facility is not on or adjacent to the project area, so

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				enforcement action (CAA 113(d) Action for Penalty) resulted from noncompliance with the Chemical Accident Prevention Provisions under Section 112(r) of the CAA. Facility also covered under an NPDES Permit.	impacts to the project are not anticipated.
FINDS	D14/D17 - Lower East Report 5488614.34s	Port Authority, Playa de Guayanilla	<i>3/8 mile east</i>	US EPA Air Quality System contains ambient air pollution data collected by air pollution control agencies from monitoring stations. These locations appear to be monitoring stations. Guayanilla is known to have monitoring stations for PM _{2.5} .	Not related to storage, disposal, or release of hazardous substances. No impact to project. Recommend dust control measures during project implementation to minimize construction impacts on air quality.
UST	19 - Lower East Report 5488614.34s	Las Magas S/S # 841	<i>1/2 mile northeast</i>	Tank and facility currently in use.	No reported releases of petroleum products. Located on opposite side of PR-2 and not expected to impact project area.

***Search distance of ½ mile from project boundary (for all databases) up to 1 mile from project boundary (for NPL or RCRA CORRACTS databases). Distances calculated from project boundary in Figure 3 using GoogleEarth.**

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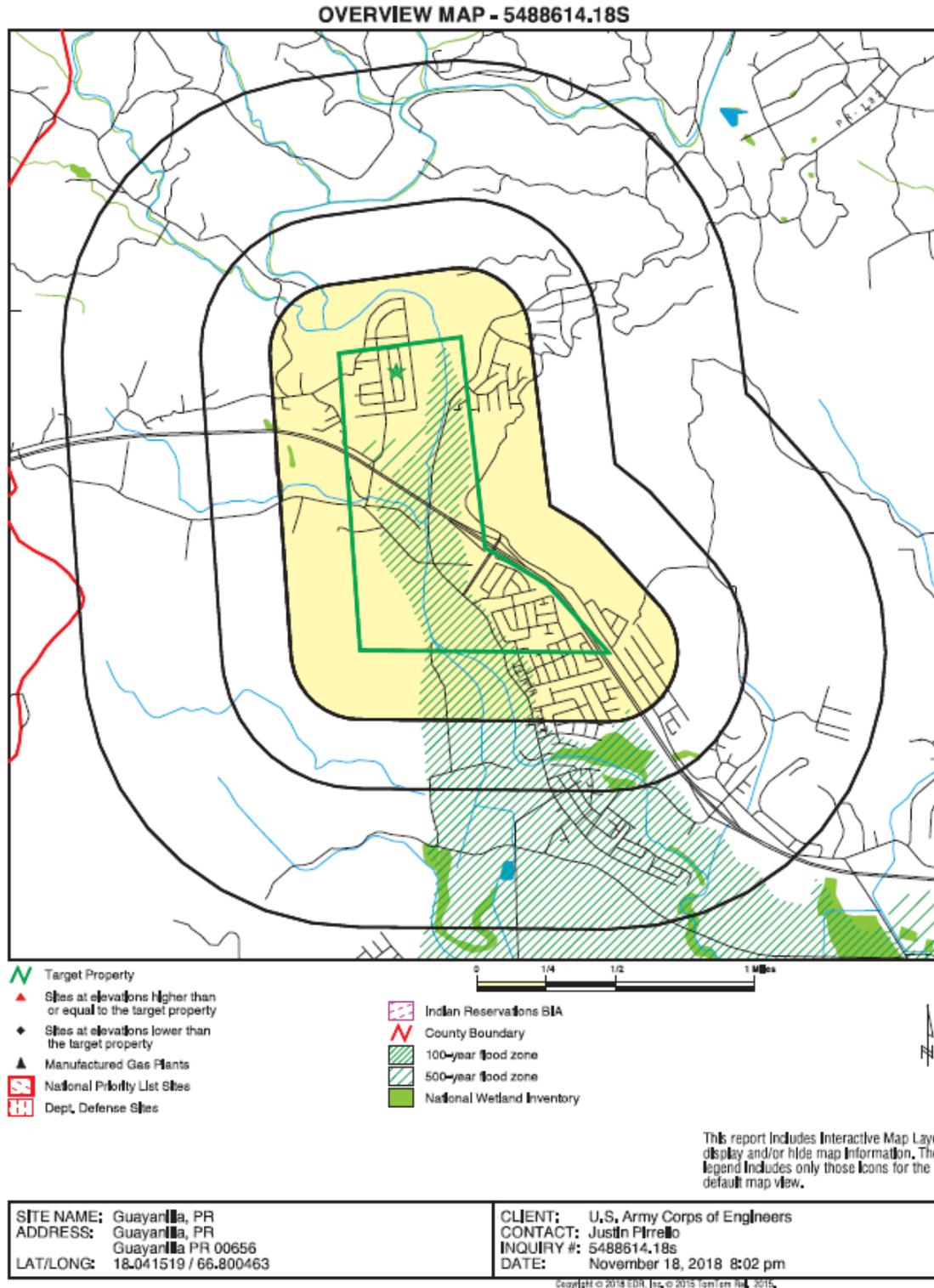


Figure 6. EDR Search Results Map – Upper Project Area / Report #5488614.18s.

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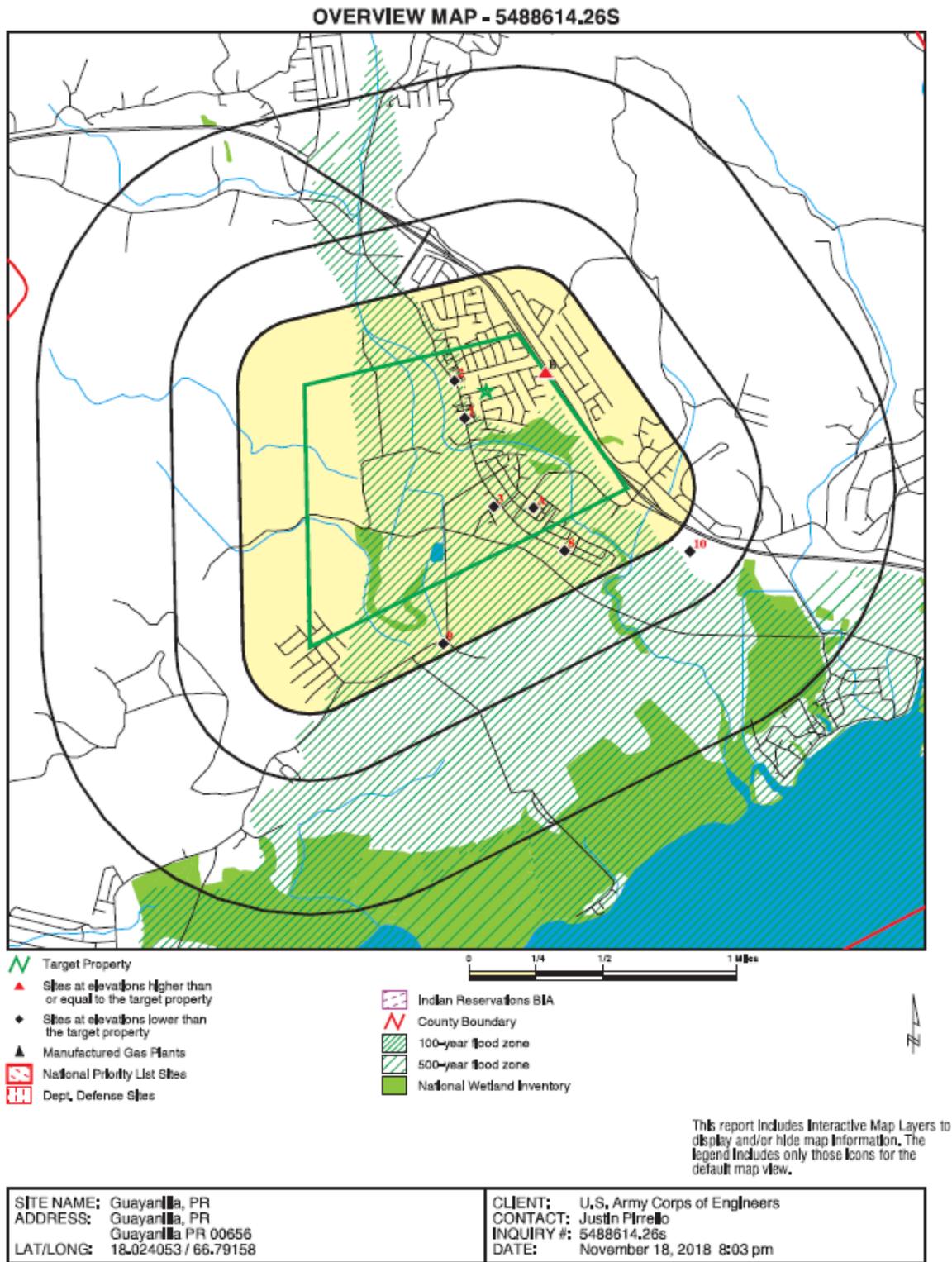


Figure 7. EDR Search Results Map – Mid Project Area / Report #5488614.26s

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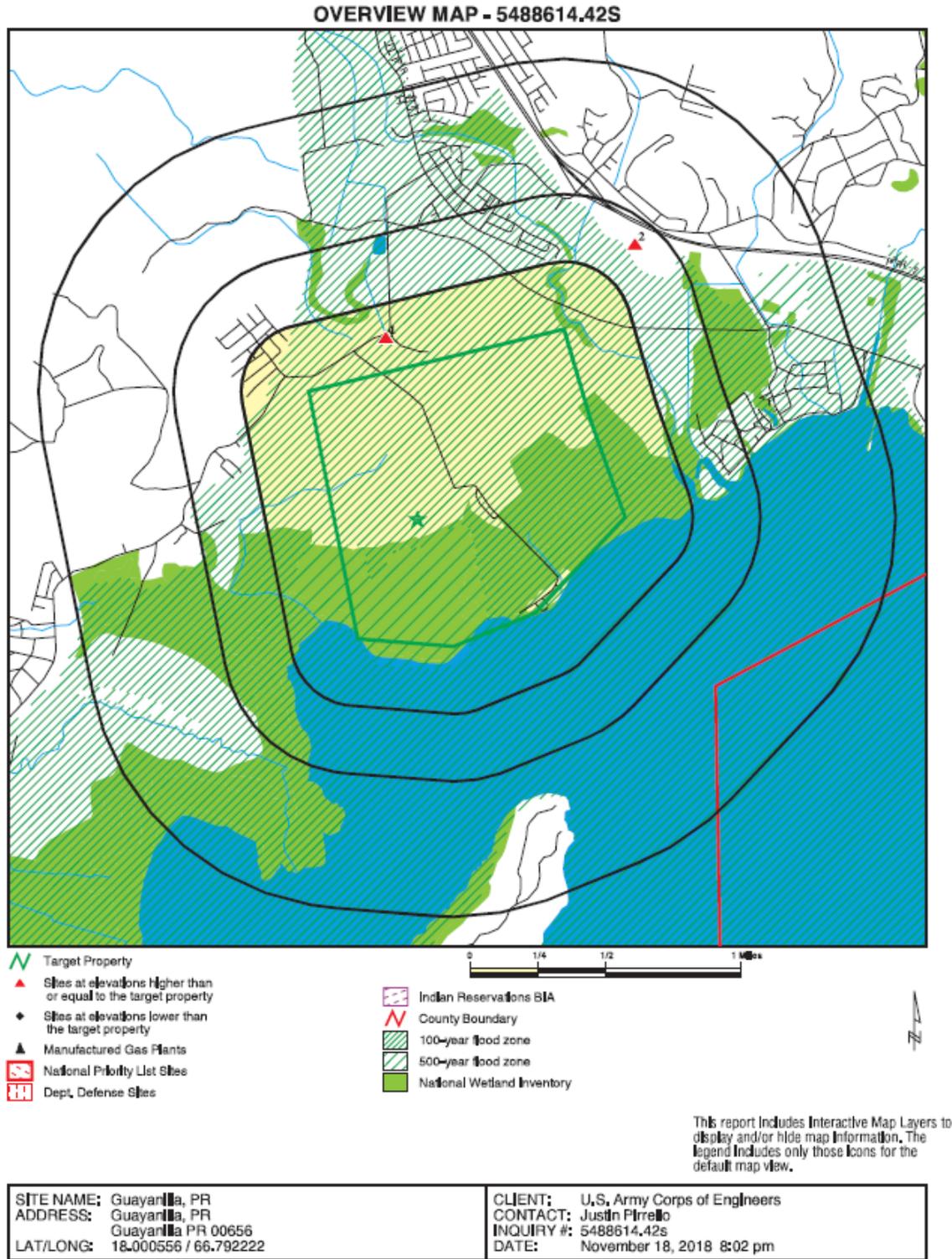
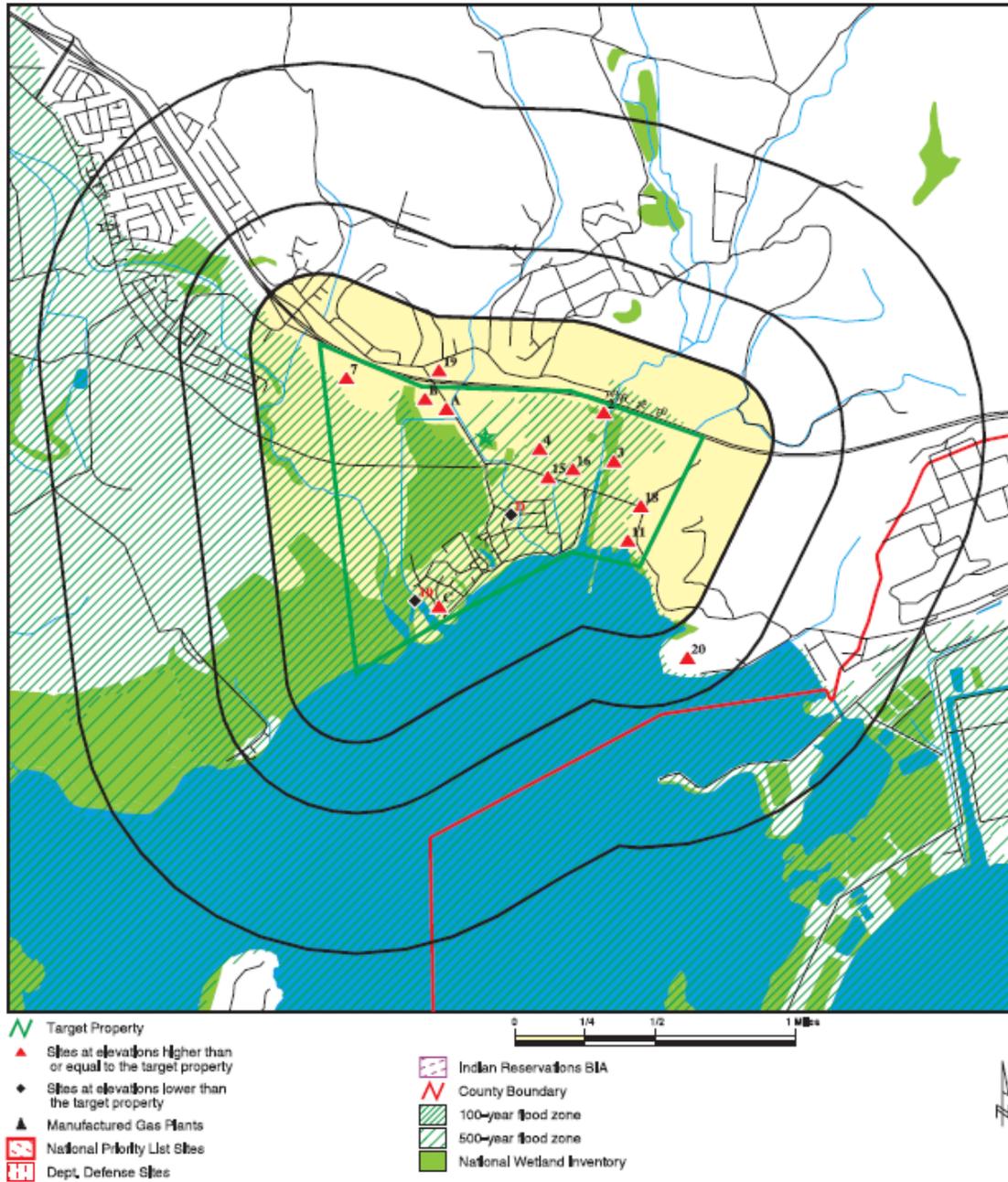


Figure 8. EDR Search Results Map–Lower West Project Area/Report #5488614.42s

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OVERVIEW MAP - 5488614.34S



This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

<p>SITE NAME: Guayanilla, PR ADDRESS: Guayanilla, PR Guayanilla PR 00656 LAT/LONG: 18.012259 / 66.772482</p>	<p>CLIENT: U.S. Army Corps of Engineers CONTACT: Justin Pirrello INQUIRY #: 5488614.34s DATE: November 18, 2018 8:02 pm</p>
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Figure 9. EDR Search Results Map – Lower East Project Area/Report #5488614.34s

SITE RECONNAISSANCE

A site visit was conducted at the Guayanilla River project area by the PDT November 27 – 29, 2018. Weather on the days of the site visit was mostly sunny, with temperatures in the low to mid-80s. Photo documentation of the site visit is provided in Attachment 7. All portions of the project site, river, and nearby RECs were limited to only those areas accessed or visible from public roads and right-of-way. Note that the proposed borrow area was not viewed, because it was not identified at the time of the site visit. No signs of HTRW were visible in portions of the project area visited that would affect construction of the project.

27 November 2018: Guayanilla River and Proposed Diversion Channel

The upper portion of the river and project site was first viewed from below PR-2. The roadway along the river (Calle 3) under PR-2 was being undercut due to scour, and minor amounts of trash (litter) were observed, along with some woody debris and stones deposited under the bridge.

The upper river was then viewed from PR-127 bridge. The floodplain widened significantly south of the bridge, and what appeared to be an old, possibly non-functioning pipe was observed at the bottom.

The location of the proposed diversion channel was viewed in the large field west of the river. There were no obvious signs of HTRW release or impacts to ground or vegetation. A small homestead was observed in the field.

The river was then viewed in town from two more PR-127 crossings, where rocky sediment accumulation was observed and outfall pipes were observed. None of the outlets were discharging and no indication of HTRW releases were observed. Horse dung was seen at the last location.

Last, the river was viewed from PR-3336, where the Phase 1 Guayanilla River Channelization project was completed and the diversion channel would rejoin the river.

28 November 2018: Proposed Diversion Channel and Potential RECs

Locations where the proposed diversion channel would cross Calle Vertedero and PR-335 were observed. There is a working fruit (banana) plantation the channel would travel through alongside PR-3336 before joining the river again. No signs of HTRW or petroleum releases were noted on the roadway or in the field. The Tropical Fruit farm building was also viewed from the road; no storage, use, disposal, or release of fertilizer or pesticides could be seen.

Other potential RECs were viewed that were not located on or adjacent to the project site. These included gasoline service stations (Shell, Puma), Demaco Corp, Rico Chemical

Corp, PPG Industries, Master Paints, Linde Gas, and PRASA WWTP. None were identified as posing a risk for construction activities on the project site.

29 November 2018: Phase 1 Guayanilla River Channelization Project

The Phase 1 Guayanilla River Channelization Project was viewed at the top of the levee and at the outlet to Guayanilla Bay. Horses were present. No significant HTRW concerns were seen that would impact proposed levee maintenance activities.

NONSTRUCTURAL MEASURES

In addition to consideration of structural measures for flood risk management, nonstructural measures are evaluated in the feasibility report. Physical nonstructural measures such as acquisitioning, flood-proofing, and elevation of structures were screened out once determined they were too expensive to implement when more efficient solutions were viable. Therefore an HTRW investigation for these type of nonstructural measures, including lead and asbestos, will not need to be completed.

The following two measures were retained to create the nonstructural alternative: *Flood Warning System* and *Removal of Impediments to Flow*. While a standalone nonstructural alternative comprised only of these measures would not provide the benefits necessary to be considered as the NED plan, the separable measures of this alternative should be considered as complementary to the structural set of alternatives. No further HTRW needs are anticipated for either of these measures. A flood warning system would take real time weather data and provide instant reports and alerts for flood warnings. The removal of impediments to flow would involve the removal of vegetation, rocky sediment, and debris that can accumulate in the channel and interfere with the conveyance of flood flows. Removing this material would maintain a) existing flows without implementation of structural measures or b) the bank full flows required to keep the Rio Guayanilla riverine ecosystem intact should a structural measure be implemented. Removal would be implemented on a priority-basis at the 3 bridge crossings on the natural channel of the Rio Guayanilla. This material is not expected to contain HTRW, and maintenance is designed to be minimal so that likelihood of encountering HTRW is small.

FINDINGS AND CONCLUSIONS

This HTRW investigation was performed to determine if HTRW and non-HTRW environmental issues at the Rio Guayanilla FRM project areas have impacted the project site or will impact implementation of the proposed project. According to ER 1165-2-132, non-HTRW environmental issues that do not comply with federal, state, and local regulations should be discussed in the HTRW evaluation along with HTRW issues. The investigation is based on an existing information review, database research, historical aerial photograph and topographic map review, and site reconnaissance. Summary of findings from this investigation are outlined below.

The project is located in a predominantly rural area adjacent to the Town of Guayanilla and the Guayanilla River. Review of historical topographic maps and aerial photographs suggest the project area was largely undeveloped and used for agricultural purposes.

One Recognized Environmental Condition (REC), or potential HTRW, was identified in the project area. The proposed diversion channel is built through a banana field farmed by Tropical Fruit Co., which was responsible for uncontrolled releases of pesticides to air in 1996-1997. The current quality of soil or groundwater on the property is unknown, however the farm is still operating and residual levels of fertilizer or pesticides in the soils would be expected in the soils. A Phase II Environmental Site Assessment would be advised if excess soil were being taken off-site, however material is going to be managed on-site by re-using suitable excavated material or placing unsuitable excavated material on areas adjacent to the project site for disposal. There are no additional impacts from this REC that would affect project implementation.

Two RECs, Rico Chemicals Corp. and PPG Industries, were listed as corrective action and brownfield sites in the database search. The sites are located outside of the project area in an industrial barrio east of the Guayanilla River, in a coastal watershed around the mouth of the Macana River. Migration of contaminants from these sites is controlled and unlikely to have impacted the project area. Thus, these RECs are not expected to impact the project site or its implementation.

Overall, RECs in the field and the surrounding area should not have an impact on implementation of the proposed project because construction is generally avoiding HTRW contaminated parts of the study area to the extent practicable, all excavated material will be managed on-site, and HTRW response actions are not expected or required prior to project implementation.

No HTRW investigation can wholly eliminate uncertainty regarding the potential for HTRW associated with a project area. Performance of the HTRW investigation is intended to reduce, but not eliminate, uncertainty regarding the potential for HTRW in connection with a project area.

REFERENCES

American Society for Testing of Materials. Publication E 1527-13. Standard Practice for Environmental Assessments: Phase I Environmental Site Assessment Process.

Department of the Army. U.S. Army Corps of Engineers. ER 1165-2-132. Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works Projects. June 1992.

Puerto Rico Environmental Quality Board, 2018. Puerto Rico 2018 305(b) and 303(d) Integrated Report - Appendix I: 2018 Cycle 303(d) List.

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)
PHASE I ENVIRONMENTAL SITE ASSESSMENT
RIO GUAYANILLA FLOOD RISK MANAGEMENT STUDY

Attachment 1. Historical Topographic Maps

DIGITAL COPIES OF ATTACHMENTS ARE AVAILABLE UPON REQUEST

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)
PHASE I ENVIRONMENTAL SITE ASSESSMENT
RIO GUAYANILLA FLOOD RISK MANAGEMENT STUDY

Attachment 2. Historical Aerial Photographs

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)
PHASE I ENVIRONMENTAL SITE ASSESSMENT
RIO GUAYANILLA FLOOD RISK MANAGEMENT STUDY

Attachment 3. EDR Database Report – Upper Project Area – Inquiry #5488614.18s.

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)
PHASE I ENVIRONMENTAL SITE ASSESSMENT
RIO GUAYANILLA FLOOD RISK MANAGEMENT STUDY

Attachment 4. EDR Database Report – Mid Project Area – Inquiry #5488614.26s.

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)
PHASE I ENVIRONMENTAL SITE ASSESSMENT
RIO GUAYANILLA FLOOD RISK MANAGEMENT STUDY

Attachment 5. EDR Database Report - Lower West Project Area – Inquiry #5488614.42s.

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)
PHASE I ENVIRONMENTAL SITE ASSESSMENT
RIO GUAYANILLA FLOOD RISK MANAGEMENT STUDY

Attachment 6. EDR Database Report – Lower East Project Area – Inquiry #5488614.34s.

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)
PHASE I ENVIRONMENTAL SITE ASSESSMENT
RIO GUAYANILLA FLOOD RISK MANAGEMENT STUDY

Attachment 7. Site Visit Photographs