



Date: May 13, 2014

**MEMORANDUM
COMMISSIONER XAVIER L. SUAREZ**

111 NW First Street, Suite 220 Miami, Florida 33128 Tel. (305) 375-5680 Fax (305) 372-6103

TO: Juan Zapata
Commissioner, District 11

DATE: April 28, 2014

FROM: Xavier L. Suarez
Commissioner, District 7

A handwritten signature in black ink, appearing to read "XLS", written over the printed name of Xavier L. Suarez.

RE: Infrastructure and Capital
Improvements Committee

After consulting with the County Attorney, I am revising my memorandum to you of April 25, 2014, as follows:

I would like to schedule a hearing before the Infrastructure and Capital Improvements Committee to discuss and hear testimony on the following issues related to Miami-Dade Waste Water System Project E13-WASD-11. Ideally, I would like to schedule this for consideration at a hearing exclusively for this purpose. The reason is that it might take a substantial amount of time as it would involve the following issues:

- 1) Memorandum dated April 23, 2014 on Miami-Dade Wastewater System Project E13-WASD-11 from Mayor Gimenez to the BCC. The memorandum is attached and is meant to be an update on both the Consent Decree implementation and the bidding process for Program and Construction Management (E13-WASD-01R). Among the things that I cannot ascertain from the memorandum are timelines for awarding the Program and Construction Manager contract or any other firm timetable for starting the work.
- 2) Issues such as storm surge and the possibility that the Virginia Key treatment plant could be under water, causing great damage to the environment and substantial repair costs. I enclose correspondence exchanged by Mayor Caplan of Key Biscayne and Mayor Gimenez. Also on this issue, please refer to the Hazen & Sawyer PowerPoint presentation attached. On this issue, I also believe that a study as recommended by FAU Professor Ricardo Alvarez is in order and would ask that Professor Alvarez be invited to testify.

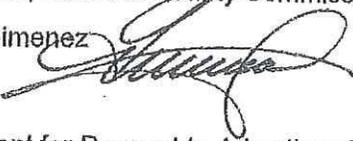
Cc: Chairwoman Rebeca Sosa
Members, BCC

Memorandum

MIAMI-DADE
COUNTY

Date: April 23, 2014

To: Honorable Chairwoman Rebeca Sosa
and Members, Board of County Commissioners

From: Carlos A. Gimenez
Mayor 

Subject: Advertisement for Request to Advertise: Owner's Representative for Professional Engineering Services relating to the State of Florida's Ocean Outfall Legislation and Miami-Dade County's Wastewater System - Project No. E13-WASD-11

As you know, I have committed to the Board that I will present contracts for your information contracts for the design and construction of significant water and sewer projects to ensure complete transparency in the selection and bid award process. This project has been reviewed by the Small Business Development Division (SBD) of Internal Services Department (ISD) for Community Business Enterprise and Community Services Business Enterprise goal recommendations. In addition, the draft solicitations have been timely and properly posted on ISD's webpage at <http://www.miamidade.gov/procurement/solicitations.asp> and SBD's webpage at <http://www.miamidade.gov/business/contracting-opportunities-architecture-engineering.asp> for industry review and comment prior to advertisement. In addition, a monthly report on the status of the water and sewer infrastructure projects is sent to the Infrastructure and Capital Improvement Committee.

The Water and Sewer Department intends to retain one (1) qualified Consultant under a non-exclusive Professional Services Agreement for professional engineering services relating to the State of Florida's Ocean Outfall Legislation and Miami-Dade County's Wastewater System. The total not-to-exceed estimated amount of compensation for the twelve (12) year term is one-hundred forty million dollars (\$140,000,000.00). The contract term is six (6) years with a one (1) six (6) year option-to-renew with the approval of the County Mayor or the County Mayor's designee. The Program and Construction Management Services solicitation related to the wastewater systems priority projects under the Consent Decree, Project Number E-WASD-01R, is still under the cone of silence and pending award due to an ongoing responsibility review. Proposers are advised that the selected Prime firm for E-WASD-01R (Program and Construction Management Services) will be precluded from participating as a Prime Consultant or Sub-consultant at any tier for this project (Project No. E13-WASD-11).

The Request to Advertise document for the above referenced project is also attached for your information. Once the proposals are reviewed and evaluated, a recommendation for award will be presented to the Board for consideration in a timely manner.

I appreciate your support and cooperation as we proceed to address these infrastructure issues. If you have any questions, please feel free to contact me directly at 305-375-1880.

Attachments

c: R.A. Cuevas Jr., County Attorney
Alina T. Hudak, Deputy Mayor and Interim Director of Public Works and Waste Management
Lester Sola, Director, Internal Services Department
John W. Renfrow, Director, Water and Sewer Department
Bill Johnson, Director Designee, Water and Sewer Department

Memorandum



Date: April 16, 2014

To: Carlos A. Gimenez
County Mayor

From: Bill Johnson, Director, Department
Water and Sewer

Subject: Request to Advertise for Owner's Representative for Professional Engineering Services relating to the State of Florida's Ocean Outfall Legislation and Miami-Dade County's Wastewater System - Project No. E13-WASD-11

Recommendation

This Request to Advertise for a Professional Services Agreement has been prepared by the Water and Sewer Department (WASD) and is recommended for approval pursuant to Section 2-8.1 of the Code of Miami-Dade County.

Scope

PROJECT NAME: Owner's Representative for Professional Engineering Services relating to the State of Florida's Ocean Outfall Legislation and Miami-Dade County's Wastewater System

PROJECT NO: E13-WASD-11

CONTRACT NO: E13-WASD-11

PROJECT DESCRIPTION: The scope of services to be provided by the Consultant includes, but is not limited to, the following:

- A. Validate the capital program for the Wastewater Treatment Plants and Wastewater Collection and Transmission System Improvements to cost-effectively fulfill the requirements of the Ocean Outfall Legislation and to meet future system demands forecast to the year 2035;
- B. Outline, identify and/or develop preliminary policies, procedures, and practices that establish the means and methods to meet the requirements of the Ocean Outfall Legislation Program;
- C. Identify potential risks that may have an impact on the implementation of the Capital Improvement Program and provide a mitigation plan which includes identifying and recommending mitigation options to address future climate change impacts, such as sea level rise, storm surge, wind, and flooding; consider facility impacts due to sea-level rise and other potential climate change impacts on facilities;
- D. Advise and provide strategic day-to-day oversight and direction to the Ocean Outfall Legislation Capital Improvement Program;
- E. Prepare and maintain, together with WASD's staff, a Program

Management Plan for use by the Program Team, which also includes various consultants assisting WASD with the implementation of its Capital Improvement Program. This also applies to establishing proper communication protocols, design and process standards;

- F. Coordinate and assist WASD with Wastewater Facilities Master Planning as required to ensure comprehensive and long-term viability of the Ocean Outfall Legislation Capital Improvements with other concurrent legislations such as the Environmental Protection Agency Consent Decree and South Florida Water Management District's Water Use Permit requirements) and other Master Planning efforts;
- G. Establish standards and guidelines for cost-estimating. The Consultant shall work with WASD's staff to ensure that all project cost estimates meet the cost estimating standards, including those in planning, preliminary engineering and detailed design. The Consultant shall review cost estimates generated for consistency with the standards and guidelines and to ensure that cost estimates performed at various stages in the design process adequately and appropriately incorporate factors to account for project risk elements;
- H. Develop and manage the program master schedule and task schedules, including phasing work appropriately to meet Ocean Outfall Legislation requirements and future demand projections, and provide budget and cost oversight of all program elements and resources;
- I. Develop monthly progress reports that include accomplishments during the most recent reporting period, upcoming activities for the next reporting period, tracking of issues and action items identified, other related information, and contract status. Monthly reports shall be reviewed as part of monthly status meetings with WASD's Program Team. These reports may be used to prepare reports submitted to Florida Department of Environmental Protection as part of the Ocean Outfall Legislation requirements;
- J. Work with WASD to establish and implement both a physical and an electronic central Ocean Outfall Legislation Program document library. All documents associated with the Ocean Outfall Legislation Program, including reports, meeting agendas and minutes, transmittals, design drawings and specifications, technical memorandums, schedules, correspondence, e-mails etc., shall be managed and organized in the library. The Consultant may be requested to provide assistance to WASD in the development and management of a public website that contains information related to the execution of the Ocean Outfall Legislation Program. The Consultant shall develop templates for documents and reports to ensure consistency throughout the Consent Decree Program;
- K. Support WASD with water and sewer infrastructure public outreach of the Ocean Outfall Legislation Program which may include responding to inquiries and complaints;
- L. Participate in update meetings with regulatory agencies and develop required materials for each meeting;
- M. Support WASD in analyzing and preparing possible recommendations for modifications to the reuse provisions of the Ocean Outfall Legislation as included in the reporting requirements of the Ocean Outfall Legislation;

- N. Assist WASD in the preparation of all reports that are required by the Ocean Outfall Legislation Program to be submitted to Florida Department of Environmental Protection or other regulatory authority;
- O. Perform value engineering. This includes establishing when value engineering shall occur, the format and schedule for value engineering efforts, and establishing a standard value engineering report format and templates;
- P. Provide assistance to WASD, as-needed, with permits, regulatory and environmental review. The Consultant shall review permits and environmental work to ensure consistency with the overall Ocean Outfall Legislation Program;
- Q. Assist WASD in the review of design documents including constructability reviews, assist WASD and/or design consultant(s) with bid phase services, including but not limited to, drafting specifications, as needed;
- R. Oversee and support the design and construction administration phases of the capital program as needed and as required by WASD;
- S. Provide construction managers, construction coordinators, construction engineers, start-up specialists, inspectors, safety officers and administrative personnel for the successful execution of the Ocean Outfall Legislation Program and associated Wastewater Treatment Plants and Wastewater Collection and Transmission System capital program;
- T. Perform daily inspections, prepare daily logs, detailed review of contractors' updated and revised schedules, prepare recommendations for approval, review schedules of values, contract interpretations and clarifications, process and authorize progress payments including allowance account and change orders, review operation and maintenance manuals, respond to requests for information, and evaluate claims from contractors;
- U. Aid in the integration of consultant staff with WASD's staff;
- V. Provide financial and economic review and oversight during the course of the program;
- W. Evaluate and reconcile scope and other technical aspects and/or conflicts with the Consent Decree requirements;
- X. Prepare Basis of Design Reports (BODRs) as directed by WASD for specific projects as required by the program;
- Y. Provide advice to WASD and recommend the best construction delivery method for the various projects identified in the Plan; including alternative delivery methods (e.g. Design-Build, Construction-Management-At-Risk, Progressive Design-Build, Private/Public Partnership, etc.);
- Z. Assist WASD in achieving LEED Certification as mandated by the County for sustainable development for all of the qualifying projects to be executed under the Program.

PARTICIPATION RESTRICTIONS:

Proposers are advised that the selected Program and Construction Management Professional Prime Firm under Project Number E13-WASD-01R will be precluded from participating as a Prime Consultant or Subconsultant at any tier for the following project:

- Owner's Representative for Professional Engineering Services relating to the State of Florida's Ocean Outfall Legislation and Miami-Dade County's Wastewater System-Project Number E13-WASD-11.

PROJECT LOCATION: Throughout Miami-Dade County
PRIMARY COMMISSION DISTRICT: Various Districts
APPROVAL PATH: Mayor's Authority
ISD A&E: E13-WASD-11
USING DEPARTMENT: Water and Sewer
MANAGING DEPARTMENT: Water and Sewer

Fiscal Impact / Funding Source

FUNDING SOURCE: Wastewater Connection Charges
 Future WASD Revenue Bonds
 WASD Future Funding

PTP FUNDING: No
GOB FUNDING: No
ARRA FUNDING: No

CAPITAL BUDGET PROJECT	CAPITAL BUDGET PROJECT # - DESCRIPTION 962670- OUTFALL LEGISLATION Book Page: Page 118; Adopted Capital Budget Book Funding Year: 2013-2019	<u>RTA ESTIMATE</u> \$140,000,000.00
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PROJECT TECHNICAL CERTIFICATION REQUIREMENTS:

<u>TYPE CODE DESCRIPTION</u>		
Prime	6.01	WATER AND SANITARY SEWER SYSTEMS - WATER DISTRIBUTION AND SANITARY SEWAGE COLLECTION AND TRANSMISSION SYSTEMS
Prime	6.02	WATER AND SANITARY SEWER SYSTEMS - MAJOR WATER AND SANITARY SEWAGE PUMPING FACILITIES
Prime	6.03	WATER AND SANITARY SEWER SYSTEMS - WATER AND SANITARY SEWAGE TREATMENT PLANTS
Prime	17.00	ENGINEERING CONSTRUCTION MANAGEMENT
Other	9.01	SOILS, FOUNDATIONS AND MATERIALS TESTING -

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- DRILLING, SUBSURFACE INVESTIGATIONS AND SEISMOGRAPHIC SERVICES
- Other 9.02 SOILS, FOUNDATIONS AND MATERIALS TESTING - GEOTECHNICAL AND MATERIALS ENGINEERING SERVICES
- Other 9.04 SOILS, FOUNDATIONS AND MATERIALS TESTING - NON-DESTRUCTIVE TESTING AND INSPECTIONS
- Other 10.05 ENVIRONMENTAL ENGINEERING - CONTAMINATION ASSESSMENT AND MONITORING
- Other 11.00 GENERAL STRUCTURAL ENGINEERING
- Other 12.00 GENERAL MECHANICAL ENGINEERING
- Other 13.00 GENERAL ELECTRICAL ENGINEERING
- Other 14.00 ARCHITECTURE
- Other 15.01 SURVEYING AND MAPPING - LAND SURVEYING
- Other 16.00 GENERAL CIVIL ENGINEERING
- Other 18.00 ARCHITECTURAL CONSTRUCTION MANAGEMENT
- Other 19.06 VALUE ANALYSIS AND LIFE-CYCLE COSTING - WATER AND SANITARY SYSTEMS

SUSTAINABLE BUILDINGS ORDINANCE:
(I.O NO. 8-8)

Does the project qualify for compliance with the Sustainable Buildings Ordinance? NO

TOTAL ESTIMATED CONTRACT PERIOD:

2190 Calendar Days Excludes Warranty Administration Period.

IG FEE INCLUDED IN BASE CONTRACT:

Yes

ART IN PUBLIC PLACES:

No

BASE ESTIMATE:

\$140,000,000.00

OPTION TO EXTEND: **AMOUNT:** \$0.00 **DAYS:** 2190 **EXTENSION COMMENT:** One (1) six (6) year option-to-renew. The County Mayor or County's Mayor's designee has the authority to authorize one (1) six (6) year option-to-renew.

CONTINGENCY ALLOWANCE (SECTION 2-8.1 MIAMI DADE COUNTY CODE): **TYPE PERCENT AMOUNT COMMENT**
 N/A 0% \$0.00

TOTAL DEDICATED ALLOWANCE: \$0.00

COST ESTIMATE: \$140,000,000.00

Track Record / Monitor

EXPLANATION: N/A - This information will be included in the award recommendation.

MINIMUM QUALIFICATIONS EXCEED LEGAL REQUIREMENTS: Yes

The Prime Consultant shall be an engineering firm experienced in all phases of wastewater engineering, including design, permitting, construction, operation and maintenance of wastewater treatment, collection, transmission and disposal systems.

The Prime Consultant shall also be able to demonstrate successful experience with Programs and Construction Management Services related to the above listed activities, as well as planning, implementing and managing similar programs of a similar size within the last ten (10) years from the date of the solicitation. The Prime Consultant must have been a Program Manager on a Wastewater Capital Program with a major utility within the last ten (10) years from the date of the solicitation. The Prime Consultant shall also be able to demonstrate successful experience in all phases of wastewater engineering related services including, but not limited to: master planning, value engineering, design, permitting, construction management, operation and maintenance for major upgrades of wastewater treatment plants and, wastewater collection and transmission systems. The Prime Consultants (whether responding alone or as a joint venture) shall be able to provide at least one (1) example where they provided a comprehensive construction management team for the upgrade of similar wastewater system with a minimum combined capital program of nine hundred million dollars (\$900,000,000.00), which could be for more than one (1) project or more than one (1) firm and the upgrade of a wastewater collection and transmission system and reclaimed water systems, including pump stations with a minimum combined capital program of four hundred million dollars (\$400,000,000.00), combined between several projects and/or Prime team members.

The Prime Consultant should also demonstrate their successful experience with design and commissioning of wastewater treatment plant upgrades including deep injection wells for effluent disposal of similar scope and complexity within the last ten (10) years from the date of this solicitation. The Prime Consultant shall

provide a list of members of the proposed Design Team, identifying the overall Design Manager(s), and the team leaders for key design specialties (process, civil, structural, mechanical, electrical, and instrumentation) and the specific role each of them will perform.

The Prime Consultant shall provide descriptions of at least one (1) successfully designed, constructed and operating major new or upgraded wastewater treatment plant in which the Prime Consultant has served as the designer within the past ten (10) years from the date of this solicitation. For projects which the Prime Consultant has served as the design consultant, the Prime Consultant shall provide the name and contact information for a Utility Executive with the Utility they served as the design consultant who can confirm their role. The descriptions shall include the client (i.e., municipality or agency), key project staff, the project name, a summary of the work performed, the contract amount, the schedule (to include start and completion dates), the specific role of the prime firm, the achievements (e.g., projects delivered on schedule, dollars saved, innovative designs implemented, new technology utilized), and a client reference and contact information.

The Subconsultants shall provide a description of at least one (1) program or project that is relevant to this Scope of Work within the past ten (10) years from the date of this solicitation specific to their proposed responsibilities. The descriptions shall include the client (i.e., municipality or agency), key project staff, a summary of the work performed, the contract amount, the schedule (to include start and completion dates), and the specific role of the subconsultant firm, the project's achievements, and client reference as well as contact information.

Project Approach and Team Integration

WASD, along with the Program and Construction Management Consultant, acting on behalf of WASD, will oversee the design and provide construction management services for the capital improvement Ocean Outfall Legislation projects in the wastewater treatment plants. The Respondent shall outline how the proposed team would approach the scope of work for design services. This shall include, but not be limited to the following:

- A. Describe how your team will complete the responsibilities and tasks outlined in the scope of work;
- B. Include a clear description of the work tasks and methods to be utilized;
- C. Identify any significant risks based on previous experience involved in successfully completing the scope of work and describe the steps/strategies they will take to manage these risks;
- D. Provide specific ideas and recommendations to properly address future climate change impacts such as sea level rise, storm surge, wind and flooding;
- E. Articulate how coordination between federal, state and local regulations, including, but not limited to, permits and the

- Consent Decree can be properly coordinated; and
- F. Include recommendations or suggestions of areas that should be included, that may not have been listed herein.

REVIEW COMMITTEE: MEETING DATE: 3/7/2014: SIGNOFF DATE: 3/26/2014

APPLICABLE WAGES: Yes
(RESOLUTION No. R-54-10)

REVIEW COMMITTEE ASSIGNED CONTRACT MEASURES:	<u>TYPE</u> <u>GOAL</u>	<u>COMMENT</u>
	CBE 28.00%	Per Administrative Order 3-32

MANDATORY CLEARING
HOUSE: Yes

CONTRACT MANAGER
NAME / PHONE / EMAIL: Patty David 786-552-8040 pattyd@miamidade.gov

PROJECT MANAGER NAME
PHONE / EMAIL: Juan Carlos Arteaga 786-552-8112 jcarteaga@miamidade.gov

Background

BACKGROUND:

The Ocean Outfall Legislation requires diverting all flows from the County's outfalls by 2025, primarily impacting the Central and North District Wastewater Treatment Plants resulting in reduced plant capacity and the addition of High Level Disinfection, filtration and disinfection to all of the North and Central District non-peak flows. In addition, the Ocean Outfall Legislation requires reuse of sixty percent (60%) of these flows resulting in the need to construct a new plant to be located in the central-western area of the County; as well as all other related alterations to the transmission and collection systems.

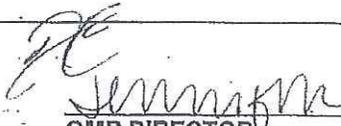
The Ocean Outfall Legislation required submission of an implementation plan to the Florida Department of Environmental Protection by July 1, 2013. On June 28, 2013, WASD submitted to Florida Department of Environmental Protection an implementation plan titled "Water and Sewer Department Ocean Outfall Legislation Compliance Plan ("Plan") which describes the recommended \$3.32 billion Plan. The total Capital Plan is \$6.2 billion of which \$3.2 billion is directly related to Ocean Outfall Legislation. It can be accessed online at www.miamidade.gov/water under "Ocean Outfall Legislation Plan". In addition to the Plan, other key provisions of the Ocean Outfall Legislation, include the following at minimum:

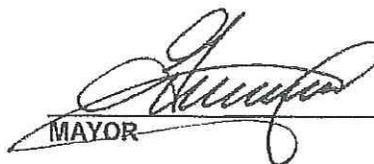
1. By July 1, 2016, submit update of Plan documenting any refinements in costs, actions and financing;
2. Meet Advance Wastewater Treatment by December 31, 2018, or Reduce cumulative outfall loadings (from 2008-2025) equivalent to Advance Wastewater Treatment from 2018-2025;
3. By December 31, 2025, stop outfall usage (except for wet weather peak flow usage up to five percent (5%) of baseline flow) and implement sixty percent (60%) reuse;
4. Considers credit for reuse at other facilities, such as WASD's /Florida Power & Light ninety (90) million gallons per day reuse project.

DEPARTMENT SELECTION COMMITTEE RECOMMENDATIONS:

<u>COMMITTEE MEMBER & TITLE</u>	<u>YEAR HIRED</u>	<u>GENDER / ETHNICITY</u>	<u>EDUCATION</u>	<u>PROFESSIONAL LICENSES</u>
Ernesto Coro, P.E., Planning Division (Alternate Member)	1994	Male/Hispanic	Bachelor of Science Environmental Engineering	Professional Engineer
Bertha Goldenberg, P.E., Assistant Director (Committee Member)	1989	Female/Hispanic	Bachelor of Science Chemical Engineering	Professional Engineer
Howard Fallon, P.E., Chief, Planning (Technical Advisor)	1989	Male/Caucasian	Bachelor of Science Mechanical Engineering, Masters in Environmental Engineering	Professional Engineer

DEPARTMENT FINANCE:  4/2/14
FRANCES G. MORRIS DATE:

BUDGET APPROVAL FUNDS AVAILABLE:  4/4/14
OMB DIRECTOR DATE

 DATE
MAYOR

CLERK DATE _____
DATE



Small Business Development Division Project Worksheet

Project/Contract Title: OWNER'S REPRESENTATIVE FOR PROFESSIONAL ENGINEERING SERVICES RELATING TO THE STATE OF FLORIDA'S OCEAN OUTFALL LEGISLATION AND MIAMI-DADE COUNTY'S WASTEWATER SYSTEM **Received Date:** 03/07/2014
Project/Contract No: E13-WASD-11 **Funding Source:** MULTIPLE **Resubmittal Date(s):**
Department: WATER & SEWER DEPARTMENT
Estimated Cost of Project/Bid: \$140,000,000.00
Description of Project/Bid: To establish a Professional Services Agreement for professional engineering services relating to the State of Florida's Ocean Outfall Legislation (OOL) and Miami-Dade County's Wastewater System. The OOL requires diverting all flows from the County's Outfalls by 2005, primary impacting the Central and North District Wastewater Plants resulting in reduced plant capacity and the addition of High Level Disinfection (HLD).

Contract Measures Recommendation

<u>Measure</u>	<u>Program</u>	<u>Goal Percent</u>
Goal	CBE	28.00%

Reasons for Recommendation

This project meets all the criteria set forth in I.O. 3-32, Section V.

The fifteen (15) Tier 1 and Tier 2 CBE firms certified in the Technical Categories (TC) identified for the prime (6.01, 6.02, 6.03 & 17.00) were polled, (along with the (complex) level of scope of services and the related requirements and qualifications; the responses were insufficient to support a "Set-Aside" of any kind; however, an increase in the recommendation of a sub-consultant goal is appropriate, based on the responses from CBE firms in some of the sub-consultant (TCs) or scopes of services.

SIC 871 - Architectural and Engineering

Technical Category: 0601-W & S Sewer Sys-Water Dist & Sanitary Sewage Coll; 0602-W & S Sewer Sys-Major Water & Sewer Pumping Facili; 0603-W & S Sewer Sys-W & S Sewage Treatment Plant; 0901-Drilling Subsurface Investigations & Seismographic; 0902-Geotechnical & Materials Engineering Services; 0904-Non-Destructive Testing And Inspections; 1005-Environmental Eng-Contamination Assess & Monitor; 1100-General Structural Engineering; 1200-General Mechanical Engineering; 1300-General Electrical Engineering; 1400-Architecture; 1501-Surveying And Mapping-Land Surveying; 1600-General Civil Engineering; 1700-Engineering Construction Management; 1800-Architectural Construction Management; 1906-Value Analysis/Life-Cycle Costing-Water & Sanitary

Small Business Contract Measure Recommendation

<u>Subtrade</u>	<u>Cat.</u>	<u>Estimated Value</u>	<u>% of Items to Base Bid</u>	<u>Availability</u>
W & S SEWER SYS-WATER DIST & SANITARY SEWAGE COLL	CBE	\$1,400,000.00	1.00%	72
W & S SEWER SYS-MAJOR WATER & SEWER PUMPING FACILI	CBE	\$2,800,000.00	2.00%	51
GENERAL STRUCTURAL ENGINEERING	CBE	\$16,800,000.00	12.00%	44
ARCHITECTURE	CBE	\$2,800,000.00	2.00%	71
ENVIRONMENTAL ENG-CONTAMINATION ASSESS & MONITOR	CBE	\$1,400,000.00	1.00%	20
GENERAL CIVIL ENGINEERING	CBE	\$5,600,000.00	4.00%	83
ENGINEERING CONSTRUCTION MANAGEMENT	CBE	\$2,800,000.00	2.00%	109
DRILLING SUBSURFACE INVESTIGATIONS & SEISMOGRAPHIC	CBE	\$2,800,000.00	2.00%	9
GEO TECHNICAL & MATERIALS ENGINEERING SERVICES	CBE	\$1,400,000.00	1.00%	14
SURVEYING AND MAPPING-LAND SURVEYING	CBE	\$1,400,000.00	1.00%	237
Total		\$39,200,000.00	28.00%	

Living Wages: YES NO

Responsible Wages: YES NO

Responsible Wages and Benefits applies to all construction projects over \$100,000 that do not utilize federal fund. For federally funded projects, unless prohibited by federal or state law or disallowed by a governmental funding source, the HIGHER wage between Davis Bacon and Responsible Wages and Benefits shall apply.

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Small Business Development Division
Project Worksheet

Project/Contract Title: OWNER'S REPRESENTATIVE FOR PROFESSIONAL ENGINEERING SERVICES RELATING TO THE STATE OF FLORIDA'S OCEAN OUTFALL LEGISLATION AND MIAMI-DADE COUNTY'S WASTEWATER SYSTEM
Project/Contract No: E13-WASD-11
Department: WATER & SEWER DEPARTMENT
Estimated Cost of Project/Bid: \$140,000,000.00

Received Date: 03/07/2014

Funding Source: MULTIPLE

Resubmittal Date(s):

REVIEW RECOMMENDATION			
Tier 1 Set Aside		Tier 2 Set Aside	
Set Aside	Level 1	Level 2	Level 3
Trade Set Aside (MCC)		Goal	Bid Preference
No Measure		Deferred	Selection Factor
CWP			3/26/14 Date

FY 2013 - 14 Adopted Budget and Multi-Year Capital Plan

- In FY 2012-13, legislation modifying the State Ocean Outfall Statute was signed into law by the Governor of Florida that provides additional flexibility for the Department to manage peak flows and to fulfill all wastewater reuse requirements in the statute; these changes save the Department approximately \$1 billion in project costs, which is budgeted at \$2.9 billion through 2025

FUNDED CAPITAL PROJECTS

(dollars in thousands)

OUTFALL LEGISLATION

DESCRIPTION: Elimination of outfall flows to the ocean
 LOCATION: Systemwide
 Various Sites

PROJECT #: 962670

District Located:
 District(s) Served:

Systemwide
 Systemwide

REVENUE SCHEDULE:	PRIOR	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	FUTURE	TOTAL
Wastewater Connection Charges	11,583	4,017	0	0	0	0	0	0	15,600
Future WAST Revenue Bonds	0	0	1,885	1,441	105,801	101,550	75,483	1,306,446	1,692,585
WAST Future Funding	0	0	0	0	0	0	0	1,379,745	1,379,745
TOTAL REVENUES:	11,583	4,017	1,885	1,441	105,801	101,550	75,483	2,686,190	2,987,930
EXPENDITURE SCHEDULE:	PRIOR	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	FUTURE	TOTAL
Planning and Design	0	1,521	182	140	10,310	9,001	7,360	261,904	291,324
Construction	0	14,079	1,693	1,300	95,485	91,549	68,124	2,424,286	2,698,606
TOTAL EXPENDITURES:	0	15,600	1,885	1,440	105,801	101,550	75,484	2,686,190	2,987,930

Estimated Annual Operating Impact will begin in FY 2018-19 in the amount of \$270,000

SYSTEM IMPROVEMENTS PROJECT - GENERAL OBLIGATION BONDS (GOB)

DESCRIPTION: Replace undersized water mains and install new fire hydrants
 LOCATION: Various Sites
 Various Sites

PROJECT #: 962630

District Located:
 District(s) Served:

Systemwide
 Systemwide

REVENUE SCHEDULE:	PRIOR	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	FUTURE	TOTAL
BBC GOB Financing	200	3,771	816	12,647	27,103	27,765	9,815	0	82,117
BBC GOB Series 2005A	709	0	0	0	0	0	0	0	709
BBC GOB Series 2008B	1,018	0	0	0	0	0	0	0	1,018
BBC GOB Series 2008B-1	2,222	0	0	0	0	0	0	0	2,222
BBC GOB Series 2011A	2,598	0	0	0	0	0	0	0	2,598
TOTAL REVENUES:	6,747	3,771	816	12,647	27,103	27,765	9,815	0	88,664
EXPENDITURE SCHEDULE:	PRIOR	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	FUTURE	TOTAL
Planning and Design	849	600	0	75	0	0	0	0	1,324
Construction	6,098	3,071	718	12,522	27,103	27,765	9,815	0	87,090
Project Administration	0	100	100	50	0	0	0	0	250
TOTAL EXPENDITURES:	6,747	3,771	816	12,647	27,103	27,765	9,815	0	88,664

Department: Water and Sewer

3/24/2014 10:52:44 AM

BUDGET PROJECT 962670 - (As per 2013-2014 Approved Budget)

Project Title: 962670-OUTFALL LEGISLATION

Project Desc: Elimination of outfall flows to the ocean

CDP Revenue:	GDP Project Revenue								Total:
	Prior:	10-11:	11-12:	12-13:	13-14:	14-15:	15-16:	FUTURE:	
Future WASH Revenue B	0	0	0	0	0	1,865,000	1,441,000	1,589,279,000	1,592,585,000
WASH 2013 Revenue Bon	0	0	0	0	0	0	0	0	0
WASH Future Funding	0	0	0	0	0	0	0	1,379,745,000	1,379,745,000
WASH Revenue Bonds So	0	0	0	0	0	0	0	0	0
Wastewater Connection	0	0	11,583,000	0	4,017,000	0	0	0	15,600,000
Wastewater Constructi	0	0	0	0	0	0	0	0	0
Wastewater Constructi	0	0	0	0	0	0	0	0	0

SITE Location/Desc:	CIIS Site Funding Info								Total:
	Prior:	10-11:	11-12:	12-13:	13-14:	14-15:	15-16:	FUTURE:	
76018 - 3071 SW 38 AVE 33146- Budget	0	0	0	6,169,000	15,019,000	0	16,911,000	3,374,042,000	3,412,141,000

Desc: Elimination of outfall flows to the ocean

	05-09-07-08- Rees: 09-07-08-09-09-10-10-11-11-12-12-13-13-14-14-15-15-16-16-17-17-18-18-19-20-21-22-23-23-24-																Total:	
	05-06:	07-08:	09-10:	10-11:	11-12:	12-13:	13-14:	14-15:	15-16:	16-17:	17-18:	18-19:	20-21:	22-23:	23-24:			
CIIS Proposed RV:	3	0	0	0	136,000	8,028,000	16,647,000	4,878,000	1,848,000	29,882,000	138,807,000	368,384,000	0	0	0	0	0	584,618,000.00
CIIS Proposed MS:	6	0	0	0	136,000	8,028,000	16,647,000	4,878,000	1,848,000	29,882,000	138,807,000	94,073,000	202,321,000	0	0	0	0	684,618,000.00

CIIS Proposed Book Report

PROJECT REPORT 4

EXIT

Current Contracts for Project 962670

Dept	ContractNo	Contract Name	RTA / MCC Award / MCC Estimated Allocation	Award Allocation	CIIS Award
WS	E13-WASH-11	Owner's Representative for Professional Engineering Services relating to the State of Florida's Ocean Outfall Legislation and Miami-Dade County's Wastewater System	\$140,000,000.00	\$0.00	\$0.00

There are no Contracts for Sites of Project 962670

Search for Site Number
Search for Budget Project Number

15



CARLOS A. GIMENEZ

MAYOR
MIAMI-DADE COUNTY

March 5, 2013

The Honorable Franklin H. Caplan
Mayor
Village of Key Biscayne
88 West McIntyre Street
Key Biscayne, Florida 33149

REFERENCE: Miami-Dade Central District Wastewater Treatment Plant at Virginia Key

Dear Mayor Caplan:

I am in receipt of your letter of February 15th regarding both short and longer term plans for our regional wastewater facilities. Certainly I share your concerns regarding the potential long term consequences of climate change and sea level rise on both public and private infrastructure. To that end, we are evaluating these factors as they may impact our regional wastewater facilities both as part of our analysis of projects needed to improve the operational reliability of the plants within the context of the Clean Water Act and as part of our planning to meet the state requirements regarding the ocean outfalls. It is, and has been, our intention to incorporate cost-effective storm surge and flood mitigation features into the design of projects that have been identified to address Clean Water Act issues at the wastewater plants. We have not included this specific aspect of these projects in the on-going consent decree discussions and drafts because, in our view, this goes beyond the current explicit requirements of the Clean Water Act. Historically the state and federal regulatory agencies have not had specific plant siting requirements or hazard risk mitigation requirements. These facility aspects have been governed by local building codes and flood elevation criteria (as was the case when the regional wastewater plants were constructed in locations largely determined by state and federal requirements governing effluent treatment and disposal). You correctly note that we have identified some flood mitigation projects at the North District plant as part of the draft consent decree project list. Those projects respond to the fact that localized flooding from rainfall has directly impaired the reliability of that plant in the past. It is also true that those projects will help to mitigate the risk of flooding from storm surges, so in that respect they illustrate the approach we will take in addressing storm surge risks at each of the plants as the projects are designed.

One of the most difficult issues associated with climate change impacts in southeast Florida is forecasting long term residential and commercial patterns. These patterns will determine long term utility requirements, among other things. We know that ground water levels will rise with sea level. In areas of low elevation, such as Miami Beach and Key Biscayne, the viability of storm water management systems will be increasingly at risk and may eventually lead to population shifts. Deciding now to completely mitigate possible storm surge risks by building new treatment plant capacity further inland carries a risk of stranding investment in capacity that

Page Two

may not be needed in the longer term. It would be akin to a decision by the Village to stop issuing building permits now in anticipation of climate change consequences that may occur 50 years from now. Replacing the capacity of the Virginia Key plant, for example, would likely cost in the range of \$3 billion (present value). A more prudent course, in my opinion, is likely to include shifting some treatment capacity to the west while undertaking the necessary upgrades (with the aforementioned cost-effective storm surge mitigation improvements) to enable us to meet existing and near term demands at our present treatment plant locations. In the future we should have a much better understanding of the climate change impacts and associated utility requirements upon which to make rational investment decisions.

The Water and Sewer Department is planning to conduct a public workshop within the next 60 days on options to address the ocean outfall requirements. By that time they also expect to have a more complete preliminary analysis of storm surge mitigation opportunities arising from the consent decree projects at the treatment plants. Certainly the Department staff will be available to meet with you and Village staff prior to the workshop to describe the status of those efforts. If you want to meet with me prior to that time, please contact my office to make arrangements of mutual convenience.

I look forward to working with you and your colleagues as we address these challenging issues in the coming months and years.

Sincerely,



Carlos A. Gimenez
Mayor

c: Honorable Chairwoman Rebeca Sosa and Members, Board of County Commissioners
Herschel T. Vinyard, Secretary, Florida Department of Environmental Protection
Gwendolyn Keyes-Fleming, Administrator, Region 4, U.S. EPA
Alina T. Hudak, Deputy Mayor
John W. Renfrow, Director, Miami-Dade Water and Sewer



VILLAGE OF KEY BISCAYNE

Village Council

Franklin H. Caplan, *Mayor*
Mayra P. Lindsay, *Vice Mayor*
Michael W. Davey
Theodore J. Holloway
Michael E. Kelly
Ed London
James S. Taintor

February 15, 2013

The Honorable Carlos Gimenez
Mayor, Miami-Dade County
Stephen P. Clark Center
111 NW 1st Street
Miami, Florida 33128
mayor@miamidade.gov

Re: Miami-Dade Central District Wastewater Treatment Plant at Virginia Key

Dear Mayor Gimenez:

The Village of Key Biscayne, with consulting support, has been monitoring plans for the central wastewater treatment plant located on Virginia Key. Key Biscayne, located just south of Virginia Key, is potentially affected directly and distinctly by the Virginia Key facility. We wish to ensure that planning and solutions for that facility are sound and effective for the long-term, with due consideration given to foreseeable risks and special circumstances.

We certainly support the impetus toward a new consent decree to address promptly Clean Water Act outflow violations and deteriorated conditions at the Virginia Key facility, and of sewer lines identified as being at risk of rupturing, including the 54 inch under-bay line from Miami Beach to Fisher Island to Virginia Key. We're informed that the current plans, featuring a new investment of approximately \$596 million to improve the Virginia Key facility, do not include adequate consideration of the risk (if not certainty) of sea level rise over time, and do not include contingencies for flood mitigation. Based on input from various consultants and sources, and our own assessment, we're concerned that the current rebuilding plan puts too little emphasis on sea-level rise that's projected to occur during the useful life of the facility, not to mention regular storm surge implications.

Commendably, Miami-Dade County demonstrates forward-thinking and leadership on climate change, as evidenced by the Green Print Plan and the 4-County Climate Compact, each of which addresses climate-adaptation strategies to protect public infrastructure. With regard to

VILLAGE OF KEY BISCAYNE

February 15, 2013

Page 2

the Virginia Key facility, we see compelling reason to plan with climate impacts in mind, inasmuch as the current facility, requiring very substantial new investment, sits on a low-lying barrier island inter-connected by bay and ocean to extensive population centers and the encompassing natural resources.

We're aware of elevation maps and climate-science projections demonstrating that in the coming years, the Virginia Key facility may be inundated or at least more exposed to direct wave action by lost shoreline. This suggests that reliance would be misplaced on a substantially and expensively rebuilt Virginia Key facility that's neither raised nor armored to withstand the regular effects of salt spray, wave action and storm surges, putting aside the occasional major storm event. Our concern is heightened in that, as we understand it, the WASD proposal for Virginia Key does not provide funding for flood mitigation. By contrast, we're advised that over \$4 million is budgeted for flood mitigation at the North District wastewater treatment plant, which is about a mile inland.

Apart from sea level considerations, we're concerned about treatment and disposal options for Virginia Key. We ask to be included in the planning process for the ocean outfall phase-out plan, which we understand is to be submitted to DEP in July. The risks associated with deep-well injection or ocean outfall plans that go awry are too direct and consequential to take lightly.

The thought of a sea-affected sewage treatment plant surely warrants a most thoughtful long-term engineering, environmental and economic evaluation. With this in mind, we request substantive feedback on the perceived adequacy of planning that does not address how future sea level changes may affect the integrity of the Virginia Key plant. We also request a briefing on the County's cost-benefit thinking about relocating the Virginia Key facility, as well as DEP and EPA thinking about the facility's siting. And especially considering the sewage overflows that have occurred in the past, we ask that the plans ultimately adopted include funding for mitigation and ongoing water quality monitoring around Virginia Key and Key Biscayne.

Certain elements of infrastructure are especially critical to our community. We have seen this recently with regard to the Rickenbacker Causeway bridges. The Virginia Key wastewater treatment plant is certainly in this category.

Thank you.


Franklin H. Caplan,
Mayor

cc: Board of County Commissioners
Herschel T. Vinyard, Jr., Secretary, Florida Department of Environmental Protection
Gwendolyn Keyes-Fleming, Administrator, Region 4, U.S. EPA



VILLAGE OF KEY BISCAIYNE

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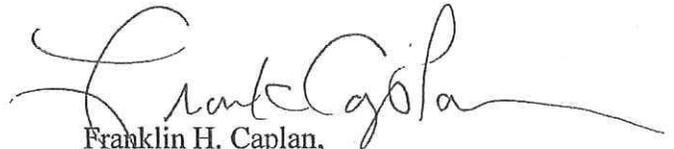
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Thank you.



Franklin H. Caplan,
Mayor

cc: Board of County Commissioners
Herschel T. Vinyard, Jr., Secretary, Florida Department of Environmental Protection
Gwendolyn Keyes-Fleming, Administrator, Region 4, U.S. EPA



***Storm Tide and Effects of
Sea Level Rise:
Impacts at Miami-Dade Water
and Sewer Wastewater
Treatment Facilities***
May 2013

**Jayson J. Page, P.E.
Beth Waters, P.E.**

HAZEN AND SAWYER
Environmental Engineers & Scientists

Storm Tide and Effects of Sea Level Rise: Impacts at MDWASD WWTP Facilities

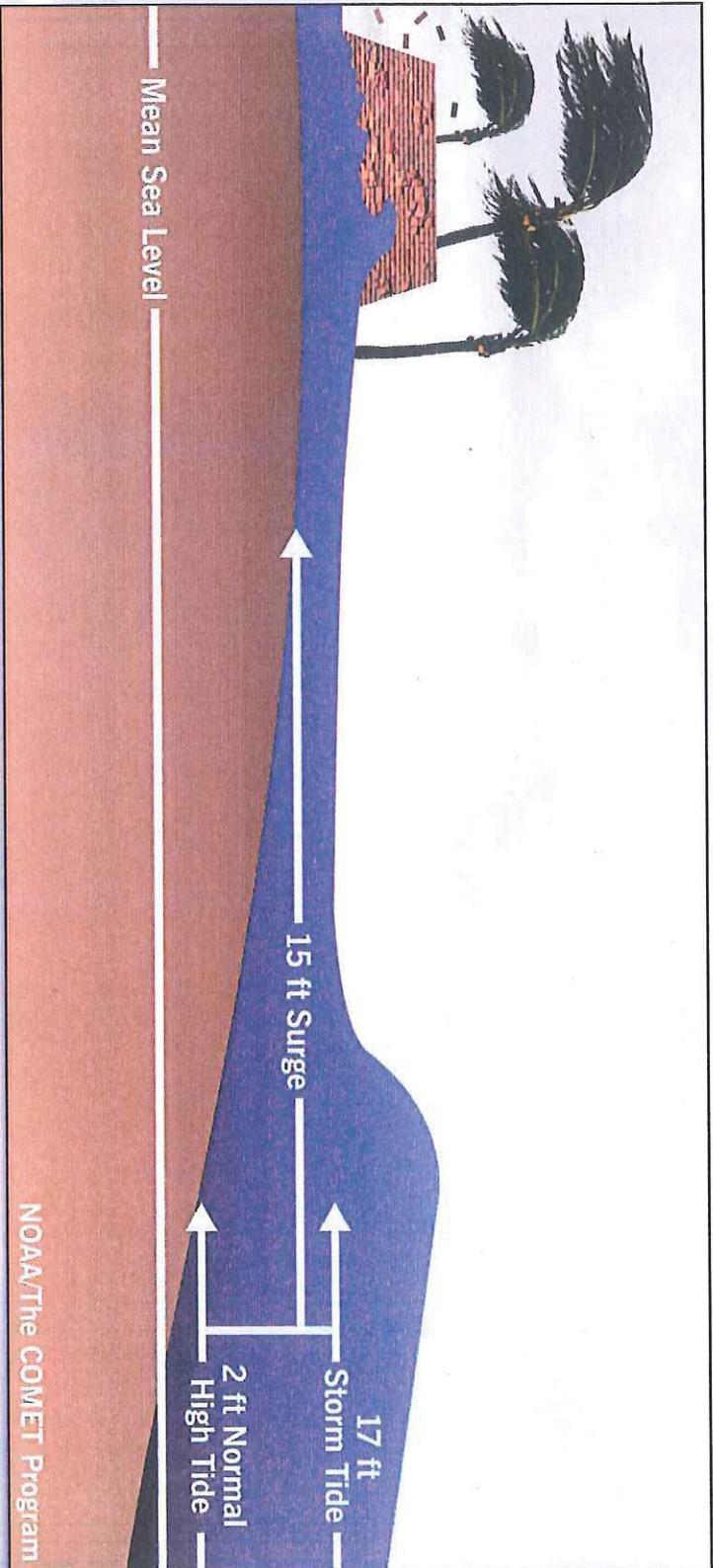
■ Presentation Outline

1. Plant Locations and Potential for Flooding
2. Analysis Approach
3. Development of Future Conditions
4. Estimated Replacement Costs
5. Mitigation Approaches and Costs
6. Conclusions
7. Recommendations

Plant Locations and Inundated Area

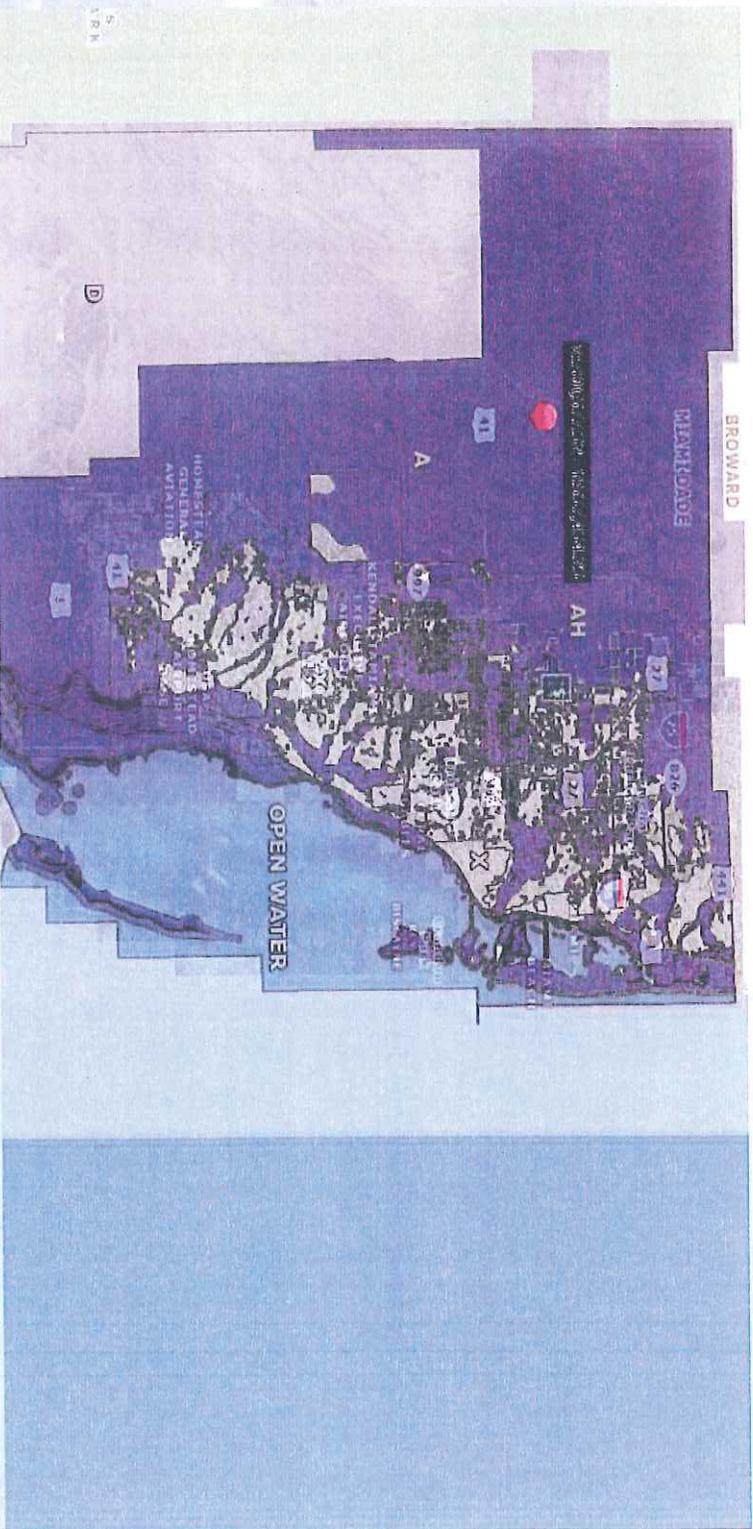


Storm Surge and Tide = Storm Tide



Miami Flood Zones

- All of the Plants are in Zone AE between 8 and 10 ft BFE



NDWWTP is in Flood Zone AE (8)

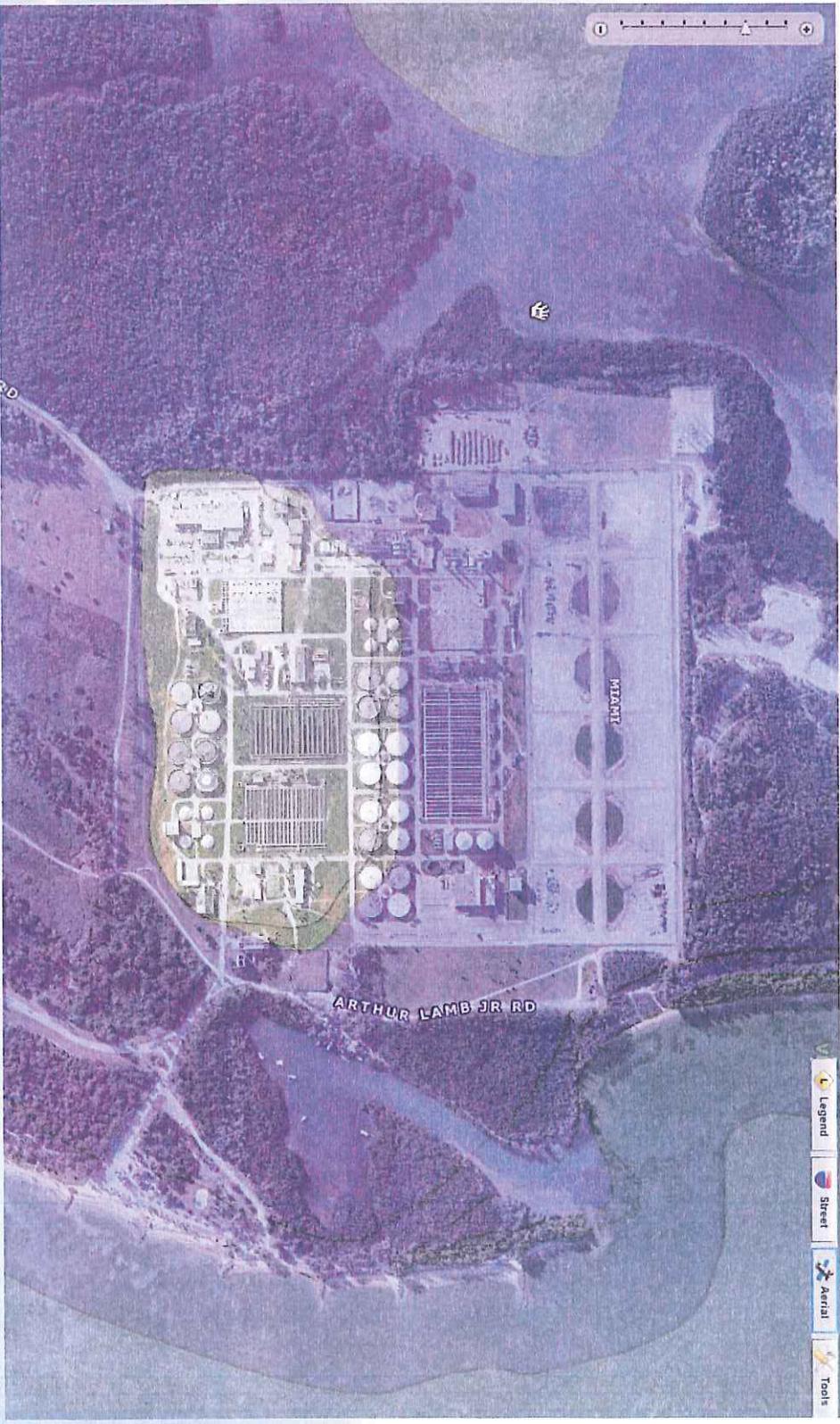


41062-009w

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6

CDWWTP Plant 1 in a Special Flood Zone



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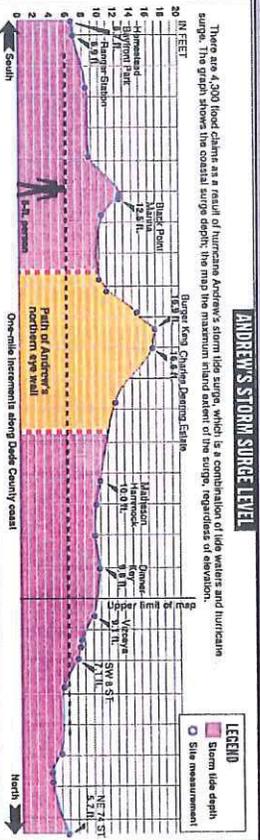
7

7

SDWWTP is in Flood Zone AE (10)



Andrew is the storm of record



There are 4,200 flood claims as a result of Hurricane Andrew's storm surge, which is a combination of tide waters and hurricane surge. The graph shows the coastal surge depth, the map the maximum inland extent of the surge, regardless of elevation.

The ocean's fury

By STEPHEN K. DOUG
Herald Staff Writer

Hurricane Andrew's storm surge inundated as much as three miles inland in places along the South Dade coastline, according to a study by the National Hurricane Center for the Federal Emergency Management Agency.

The maximum depth of the storm tide along the coast was 12.8 feet, the study found near the devastated corporate headquarters of Burger King, east of Old Cutler Road around Southwest 17th St. That peak was directly in the path of Andrew's north eye wall, the most intense part of the storm.

The flooding surge there reached almost to South Dade Blvd., the surge mostly stayed to the east side of Old Cutler Road. But cities adjacent to Old Cutler Road, such as the cities in their evening peak.

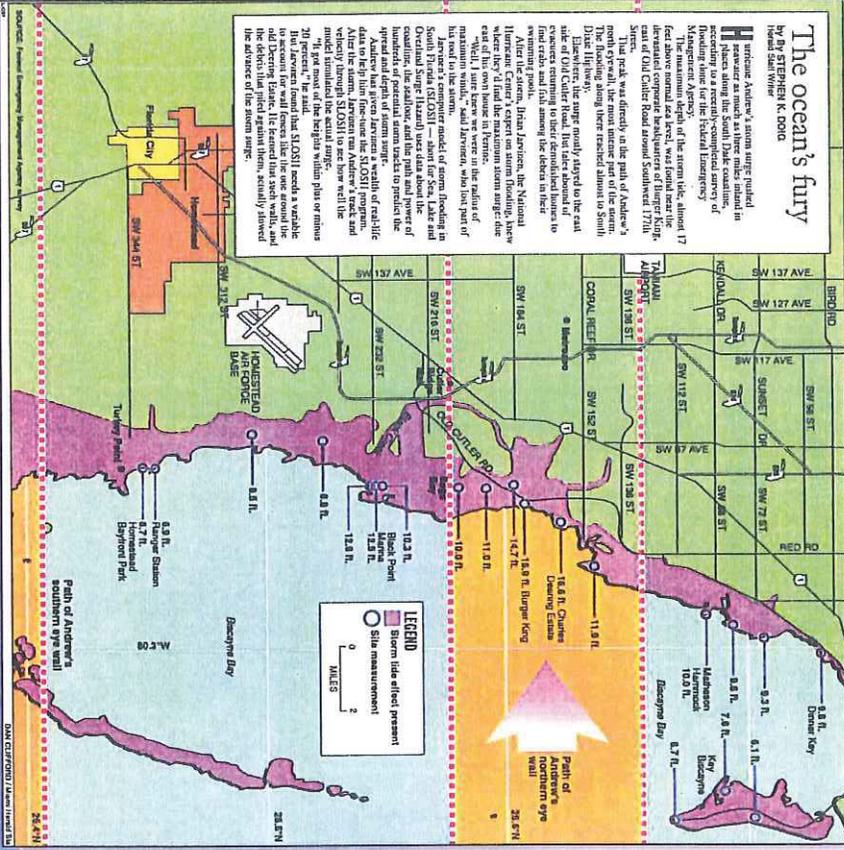
After the storm, then-juror, the National Hurricane Center's SLOSH team has been where they'd find the maximum storm surge: the maximum wind," said Jarvinen, who has part of his job to do the storm.

SLOSH is a model of storm flooding in Southern Florida. It is based on data about the coastline, the sea level, and the power of the wind and depth of storm surge.

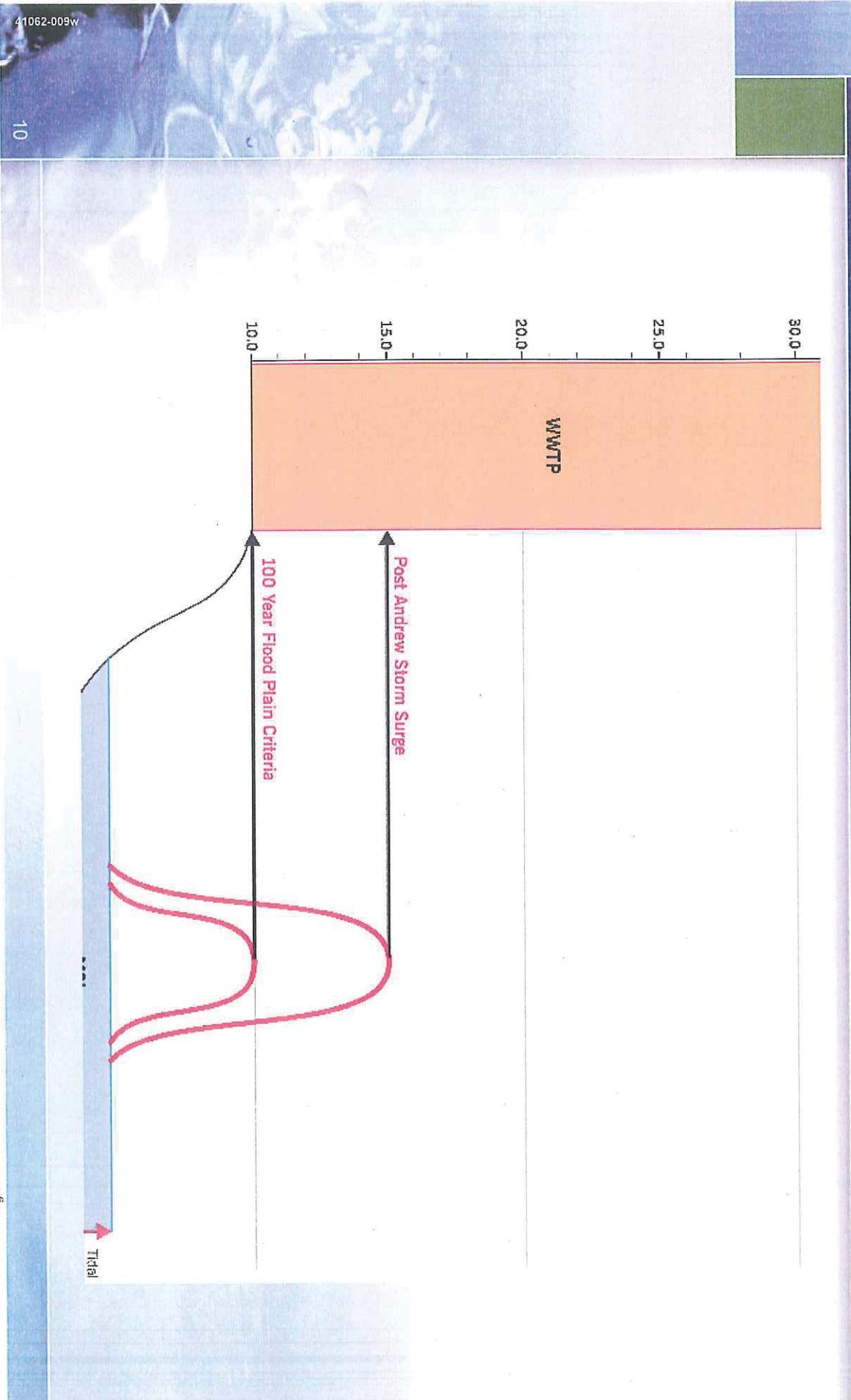
Andrew has given Jarvinen a wealth of real-life data to compare with SLOSH's predictions. After the storm, Jarvinen ran Andrew's track and velocity through SLOSH to see how well the model simulated the actual surge.

"The model was off by 20 percent or more," he said.

But Jarvinen found that SLOSH needs a variable called "storm surge." It showed that such winds, and the debris that piled against them, actually slowed the advance of the storm surge.



Andrew Changes the Risk Analysis



41062-009w

10

1b

NPCC 2009 Report
Climate Change
in NYC
(COMPLETE)

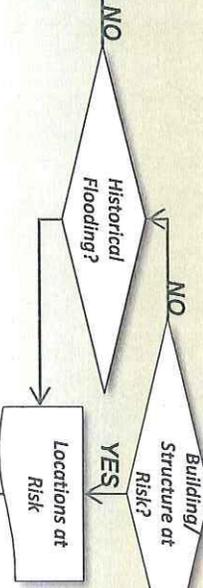
Determine Basis of
Climate Scenario
Values (COMPLETE)

Calculate Critical
Surface Water
Elevation (100-yr
Flood + 30" SLR)

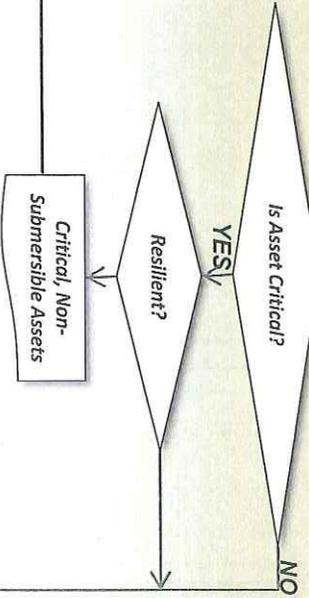
CLIMATE ANALYSIS

VULNERABILITY ANALYSIS

Facility Analysis
WWTP and
Prioritized Pump
Station Data



Asset Criticality
CIMMS
Database



ADAPTATION ANALYSIS

Strategy
Literature Review
(COMPLETE)

Select Strategies for
NYC
(COMPLETE)

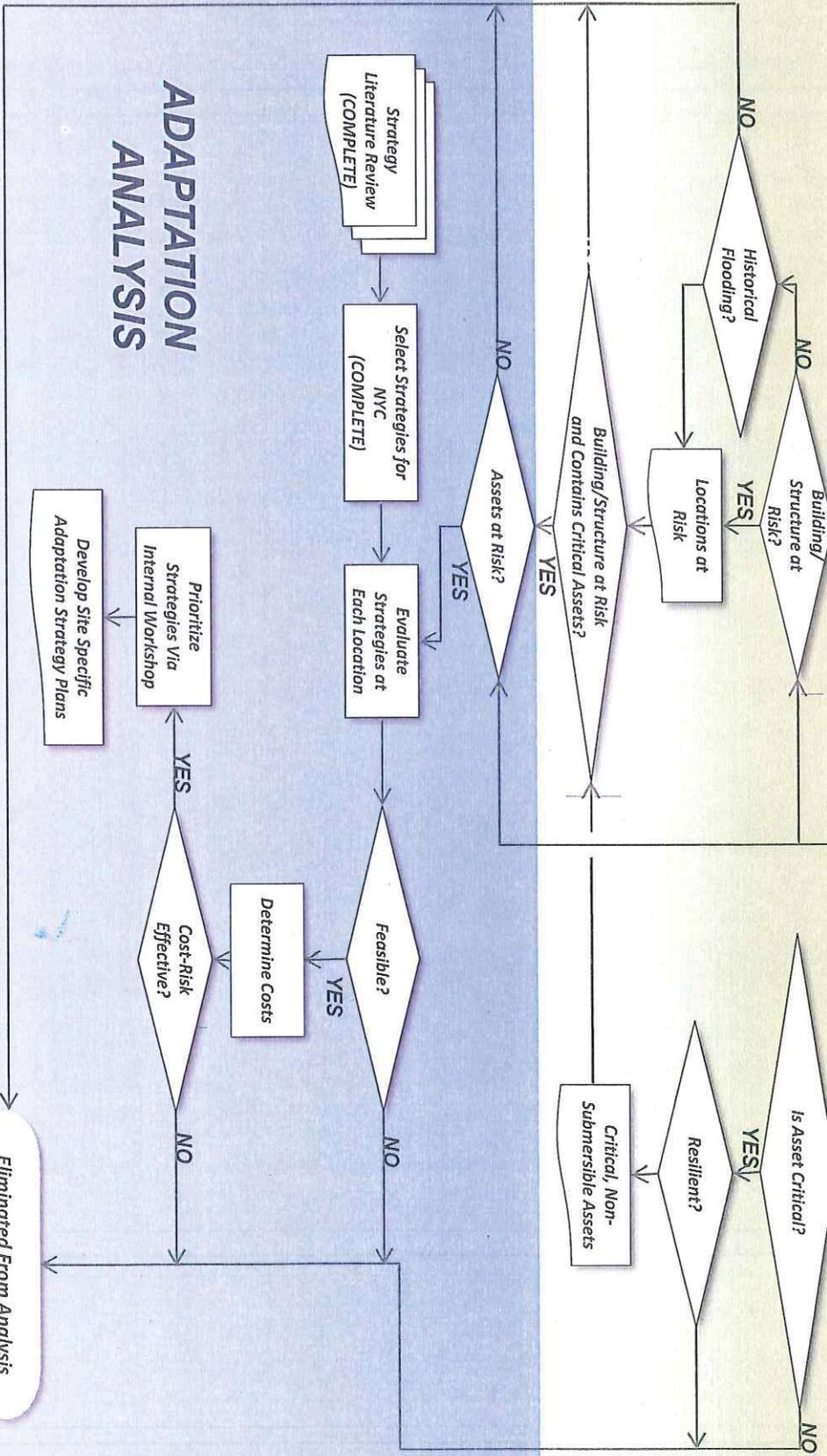
Evaluate
Strategies at
Each Location

Feasible?
Determine Costs

Prioritize
Strategies Via
Internal Workshop
Develop Site Specific
Adaptation Strategy Plans

Cost-Risk
Effective?

Eliminated From Analysis

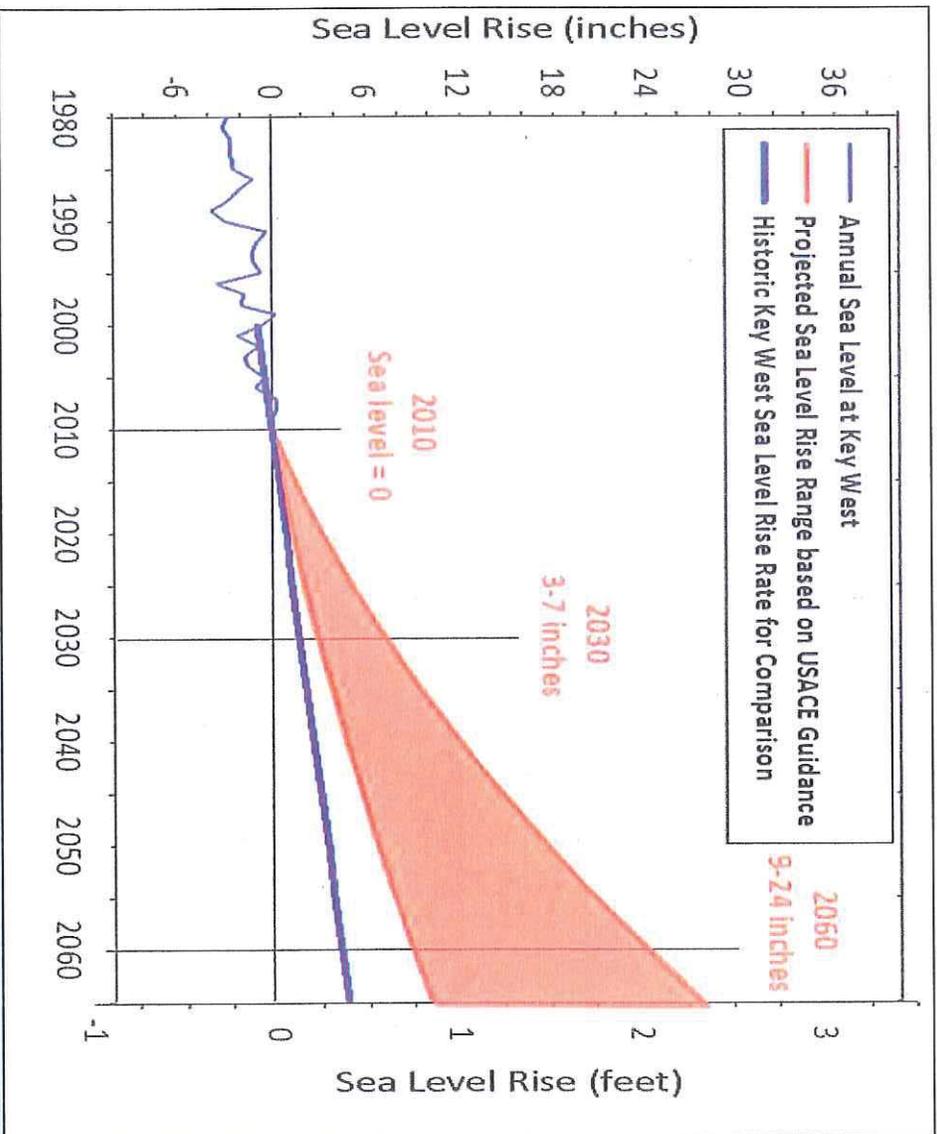


Overall Methodology

Development of Future Conditions

- Storm Surge Factors
 1. Sea Level Rise
 2. Storm Intensity
 3. Tide at Time of Storm
 4. Attenuation

Southwest Florida Regional Climate Change Compact



Sea Level Rise Tools - NOAA

Sea Level Rise and Coastal Flooding Impacts

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Sea Level Rise **Confidence** **Marsh**

Vulnerability **Flood Frequency**

Sea Level Rise

Legend

- Water Depth
- Low-lying Areas
- Area Not Mapped
- Visualization Location

Overview

Use the slider bar above to see how various levels of sea level rise will impact this area.

Levels represent inundation at high tide. Areas that are hydrologically connected are shown in shades of blue (darker blue = greater depth).

Low-lying areas, displayed in green, are hydrologically "unconnected" areas that may flood. They are determined solely by how well the elevation data captures the areas hydraulics. A more detailed analysis of these areas is required to determine the susceptibility to flooding.

Understanding the Map

Additional Information

Zoom to: Full Extent

Imagery Streets

0.05 mi 1 km

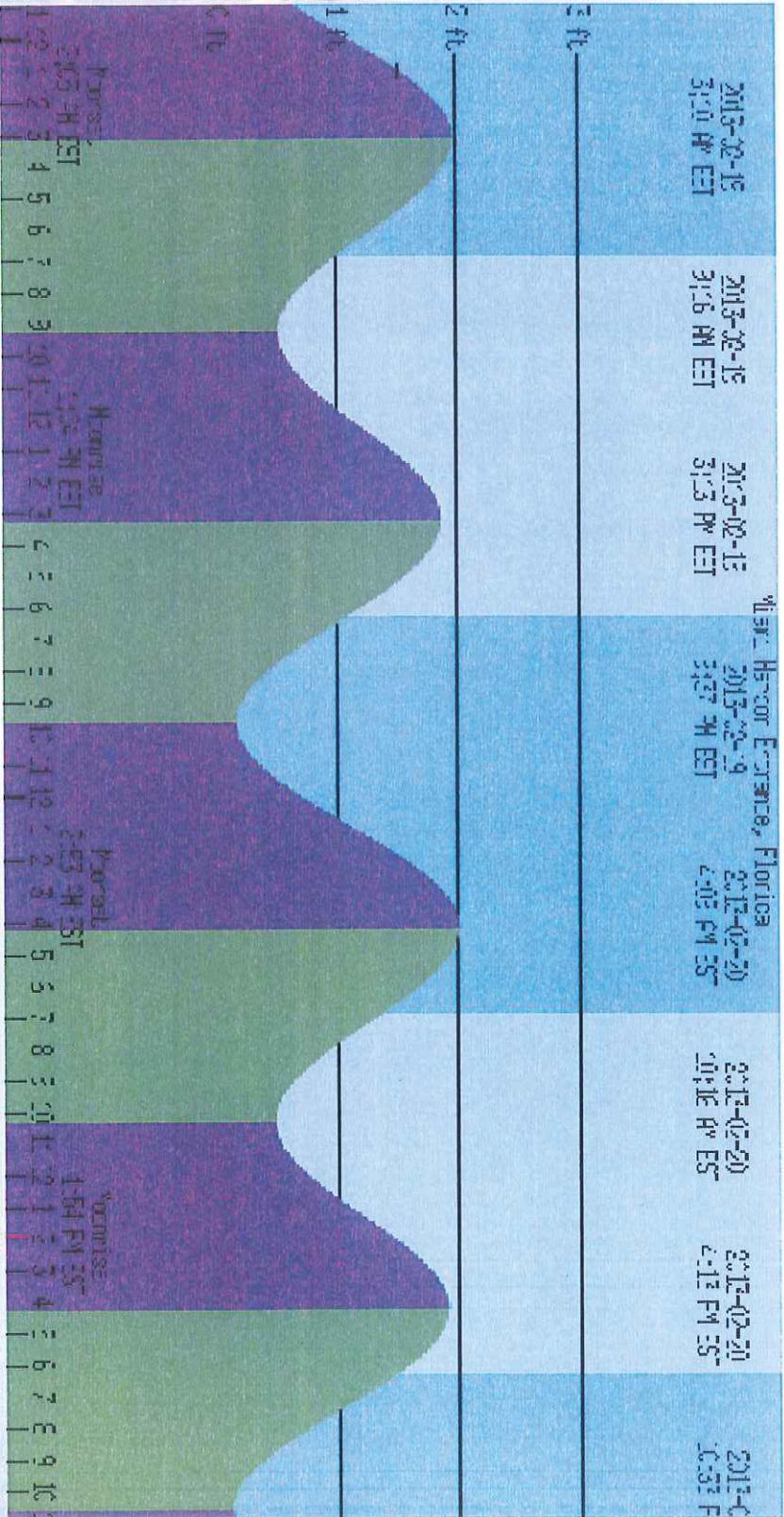
Storm Intensity

Category	Winds	Surge	Central Pressure
1 - Minimal	74 - 95 mph or 64 - 82 kts	4 - 5 feet	greater than 980 mb or 28.94 in
2 - Moderate	96 - 110 mph or 83 - 95 kts	6 - 8 feet	965 - 979 mb or 28.50 - 28.91 in
3 - Extensive	111 - 130 mph or 96 - 113 kts	9 - 12 feet	945 - 964 mb or 27.91 - 28.47 in
4 - Extreme	131 - 155 mph or 114 - 135 kts	13 - 18 feet	920 - 944 mb or 27.17 - 27.88 in
5 - Catastrophic	greater than 155 mph or 135 kts	greater than 18 feet	less than 920 mb or 27.17

Category	Wind Speed (mph)	Damage at Landfall
1	74-95	Minimal
2	96-110	Moderate
3	111-130	Extensive
4	131-155	Extreme
5	> 155	Catastrophic

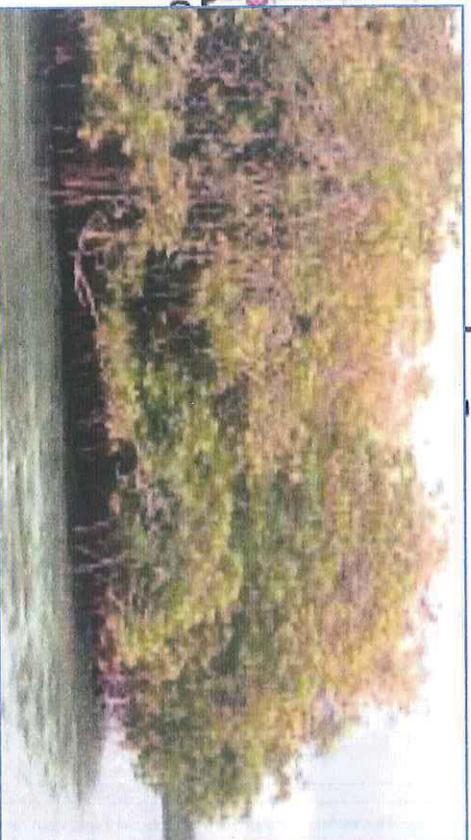
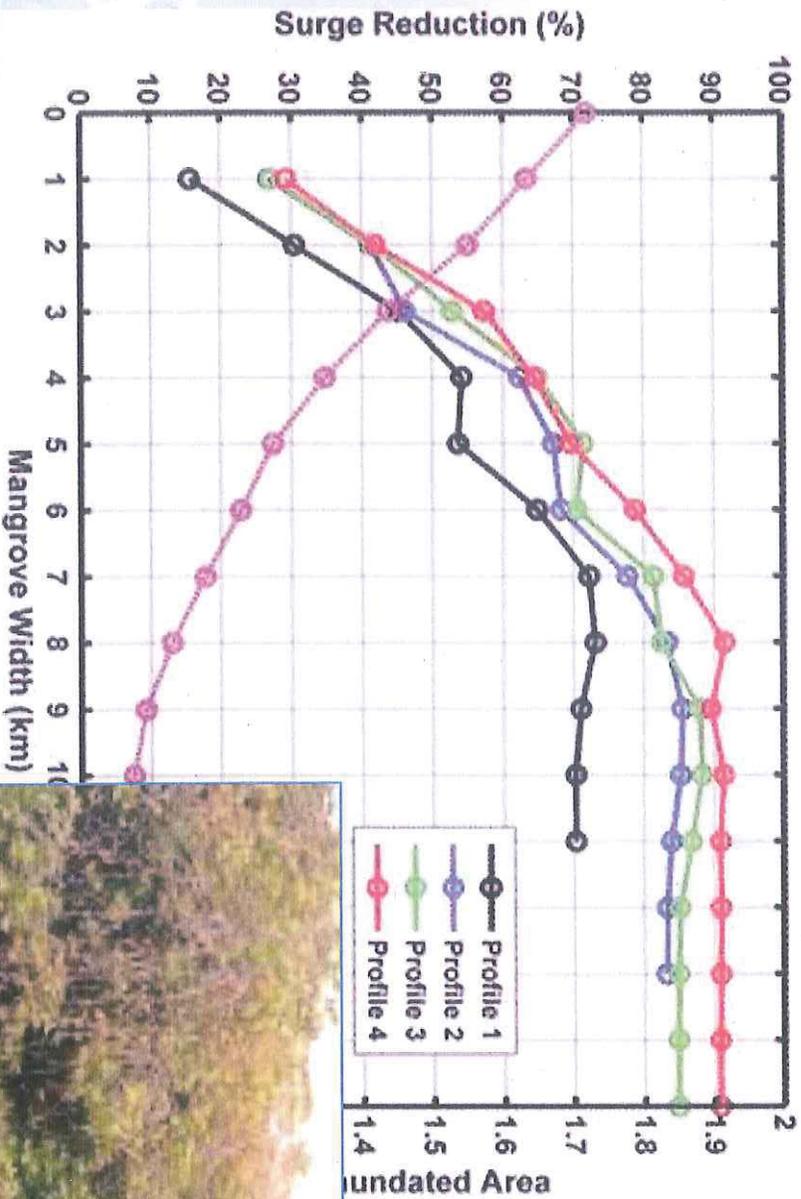
Tide at Time of Storm

NOAA Tidal Charts – Use Maximum 2.5'



16

Storm Surge Attenuation due to mangrove presence



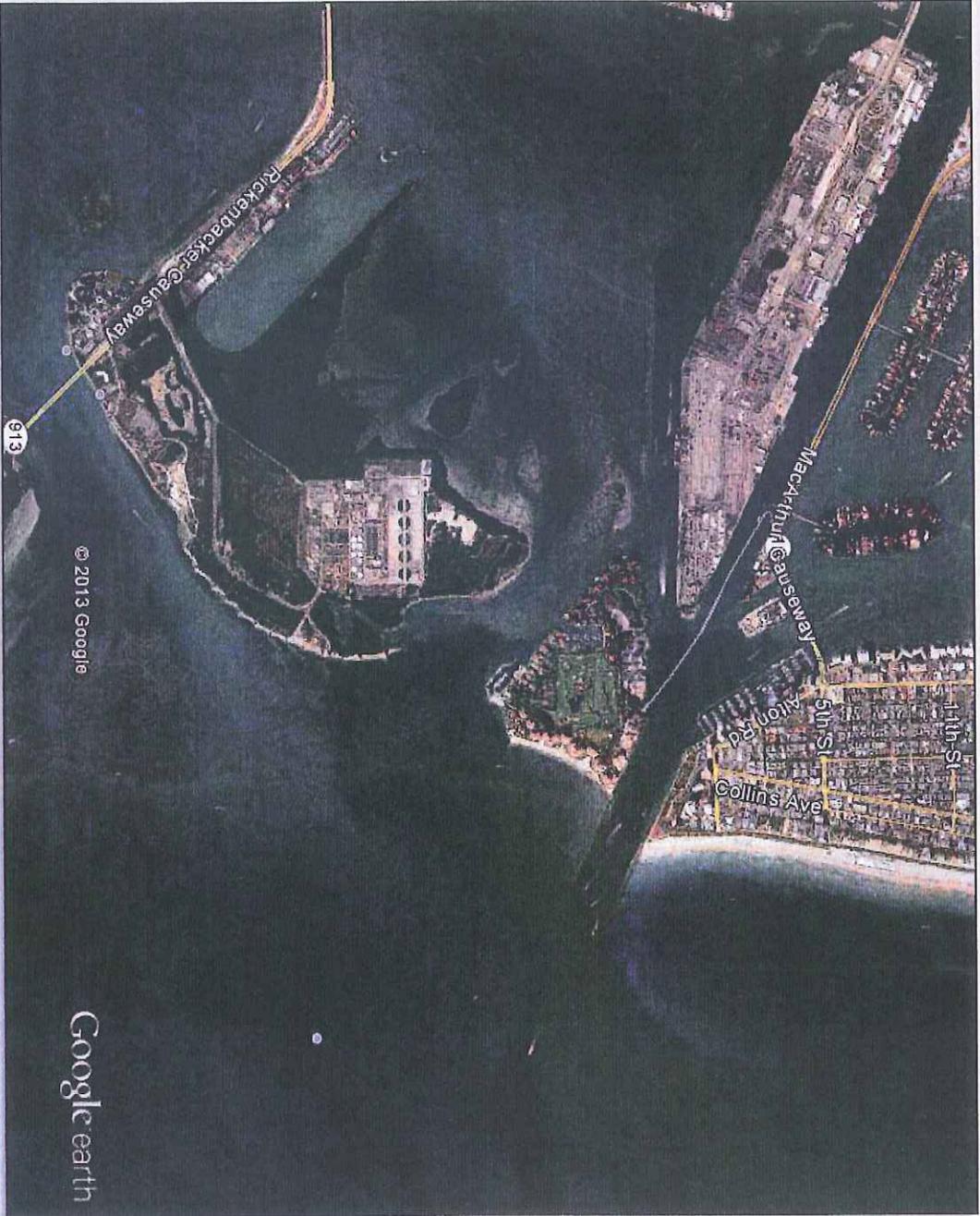
USGS - The role of mangroves in attenuating storm surges, 2012

North District Wastewater Treatment Plant



41062-009w

Central District Wastewater Treatment Plant



41062-009w

South District Wastewater Treatment Plant



Storm Tide Development at the Coast

Category	Surge Range	Surge Value	High Tide	Coastal Storm Tide				
				Current (no SLR)	2030 Low (0.25 ft SLR)	2030 High/2060 Low (0.67 ft SLR)	2060 High (2 ft SLR)	2075 High (3 ft SLR)
1 - Minimal	4 - 5 feet	4.5	2.5	7	7.25	7.67	9	10
2 - Moderate	6 - 8 feet	7	2.5	9.5	9.75	10.17	11.5	12.5
3 - Extensive	9 - 12 feet	10.5	2.5	13	13.25	13.67	15	16
4 - Extreme	13 - 18 feet	15.5	2.5	18	18.25	18.67	20	21
5 - Catastrophic	> 18 feet	16.9	2.5	19.4	19.65	20.07	21.4	22.4

Notes:

- 1) Storm categories are based on wind speed and central pressure - surge is estimated
- 2) Hurricane Andrew (Category 5 storm) resulted in a measured surge of 16.9 feet



41062-009w

Storm Tide at the WWTPs Current and 2030 Low

Category	Coastal Storm Tide	NDWWTP (1)	CDWWTP (2)	SDWWTP (3)
	Current SLR	With Full Mangrove Attenuation		
<u>1 - Minimal</u>	7.0	3.00	7.00	4.00
<u>2 - Moderate</u>	9.5	5.50	9.50	6.50
<u>3 - Extensive</u>	13.0	9.00	13.00	10.00
<u>4 - Extreme</u>	18.0	14.00	18.00	15.00
<u>5 - Catastrophic</u>	19.4	15.40	19.40	16.40
Category	SLR 2030 Low	With 50% Mangrove Reduction		
<u>1 - Minimal</u>	7.25	4.75	7.25	5.75
<u>2 - Moderate</u>	9.75	7.25	9.75	8.25
<u>3 - Extensive</u>	13.25	10.75	13.25	11.75
<u>4 - Extreme</u>	18.25	15.75	18.25	16.75
<u>5 - Catastrophic</u>	19.65	17.15	19.65	18.15

Notes:

1. NDWWTP has 1.2 miles of mangrove @ -2.5 ft/mile and barrier Island @ -1ft
2. CDWWTP has 0 miles of mangrove @ -2.5 ft/mile and no barrier Island @ -1ft
3. SDWWTP has 1.2 miles of mangrove @ -2.5 ft/mile and no barrier Island @ -1ft

Storm Tide at the WWTPs 2030 High/2060 Low and 2060 High

Category	Coastal Storm Tide	NDWWTP (1)			SDWWTP (3)
	SLR 2030 High/2060 Low (ft)	With 75% Mangrove Reduction			
1 - Minimal	7.67	5.92	7.67	6.92	
2 - Moderate	10.17	8.42	10.17	9.42	
3 - Extensive	13.67	11.92	13.67	12.92	
4 - Extreme	18.67	16.92	18.67	17.92	
5 - Catastrophic	20.07	18.32	20.07	19.32	
Category	2060 High	With No Mangrove Attenuation			
1 - Minimal	9.00	8.00	9.00	9.00	
2 - Moderate	11.50	10.50	11.50	11.50	
3 - Extensive	15.00	14.00	15.00	15.00	
4 - Extreme	20.00	19.00	20.00	20.00	
5 - Catastrophic	21.40	20.40	21.40	21.40	

Notes:

1. NDWWTP has 1.2 miles of mangrove @ -2.5 ft/mile and barrier Island @-1ft
2. CDWWTP has 0 miles of mangrove @ -2.5 ft/mile and no barrier Island @-1ft
3. SDWWTP has 1.2 miles of mangrove @ -2.5 ft/mile and no barrier Island @-1ft

Storm Tide at the WWTPs 2075 High

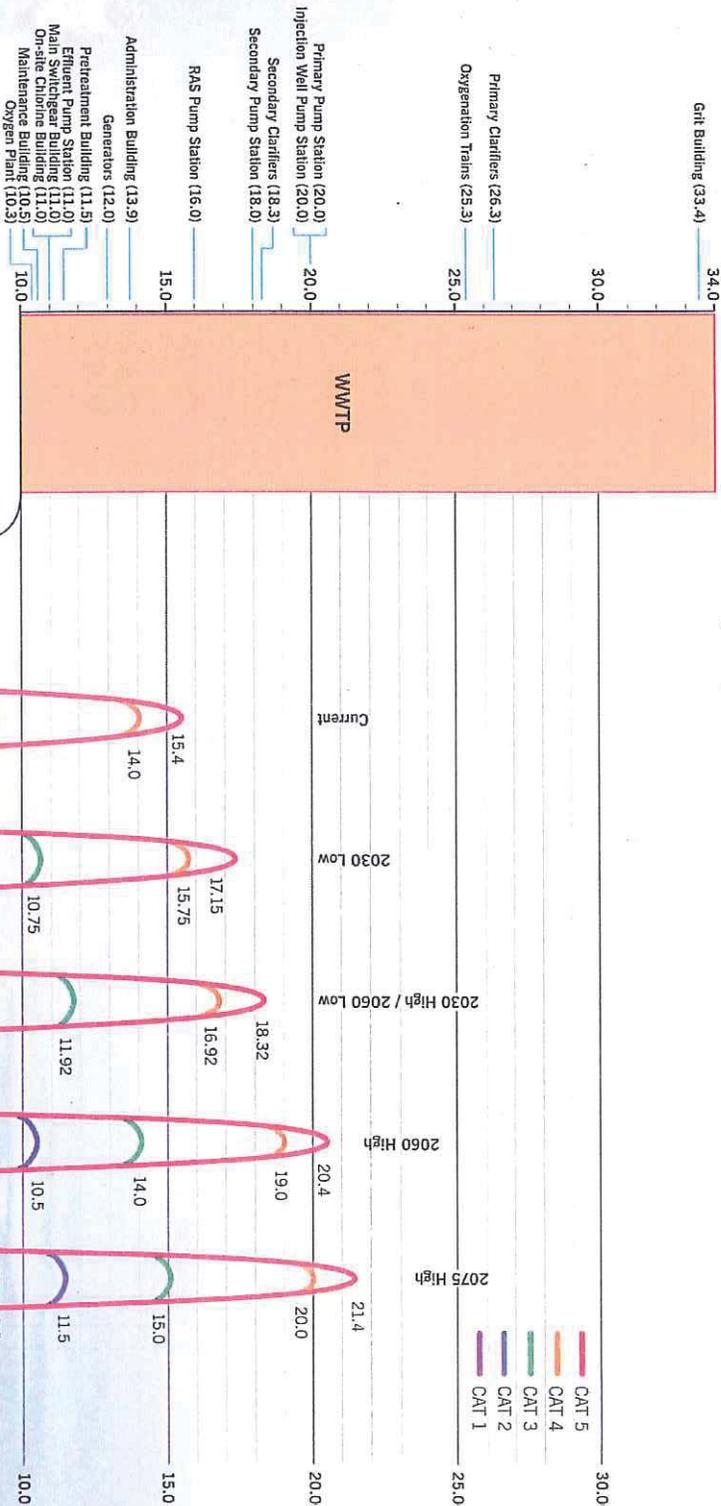
Category	Coastal Storm Tide	With No Mangrove Attenuation		
	2075 High	NDWWTP (1)	CDWWTP (2)	SDWWTP (3)
<u>1 - Minimal</u>	10.00	9.00	10.00	10.00
<u>2 - Moderate</u>	12.50	11.50	12.50	12.50
<u>3 - Extensive</u>	16.00	15.00	16.00	16.00
<u>4 - Extreme</u>	21.00	20.00	21.00	21.00
<u>5 - Catastrophic</u>	22.40	21.40	22.40	22.40

Notes:

1. NDWWTP has 1.2 miles of mangrove @ -2.5 ft/mile and barrier Island @ -1ft
2. CDWWTP has 0 miles of mangrove @ -2.5 ft/mile and no barrier Island @ -1ft
3. SDWWTP has 1.2 miles of mangrove @ -2.5 ft/mile and no barrier Island @ -1ft

NDWWTP Storm Tide Analysis

North District Wastewater Treatment Plant
Surge Analysis - All Storm Conditions



1. Values shown indicate anticipated coastal storm tide which takes into account average high tide, average storm surge for each category storm, sea level rise, and surge mitigation from the presence of mangroves which diminishes over time as sea level increases.

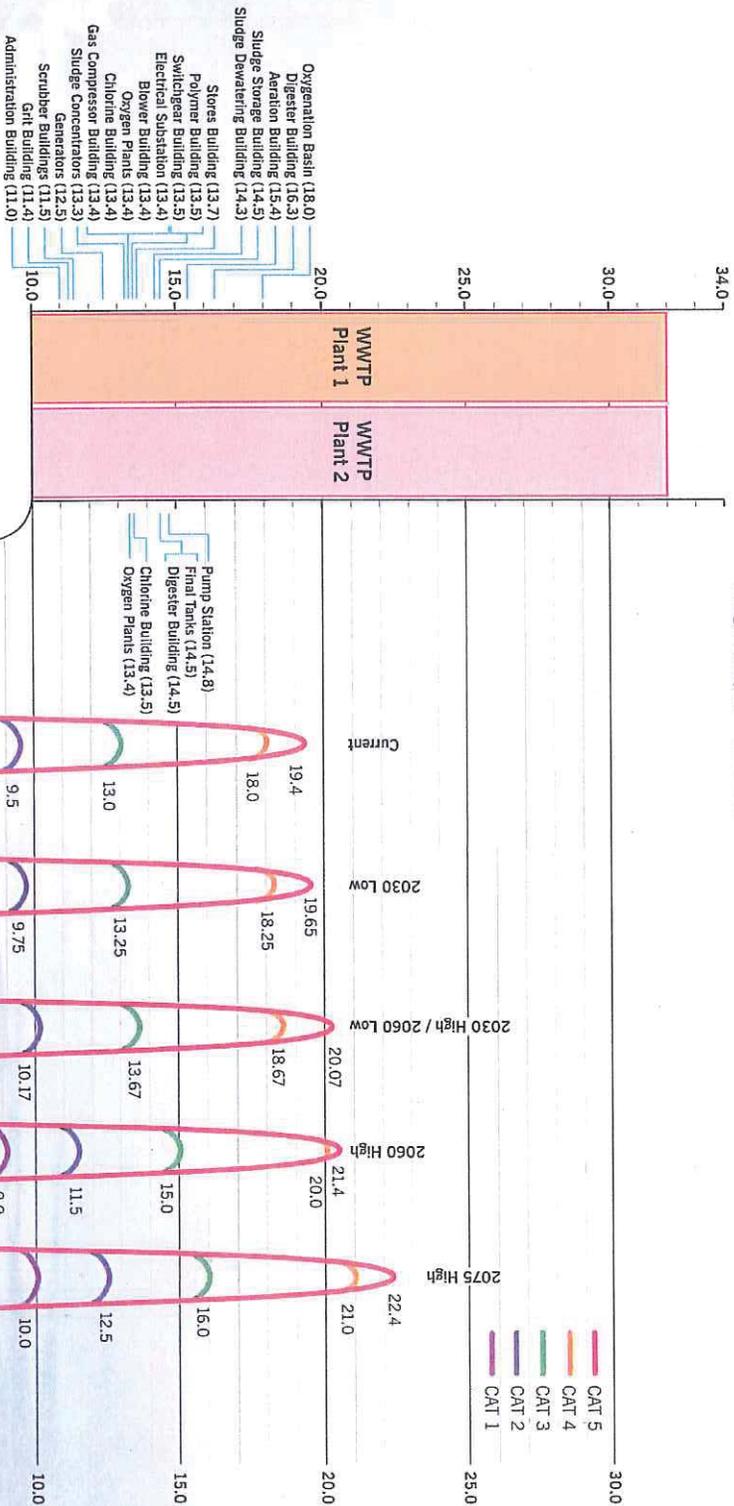
2. Surge values represent a direct hit at the plant.

NDWWTP is in Flood Zone AE (8)

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CDWWTP Storm Tide Analysis

Central District Wastewater Treatment Plant
Surge Analysis – All Storm Conditions



1. Values shown indicate anticipated coastal storm time which takes into account average high tide, average storm surge for each category storm, sea level rise, and surge mitigation from the presence of mangroves which diminishes over time as sea level increases.

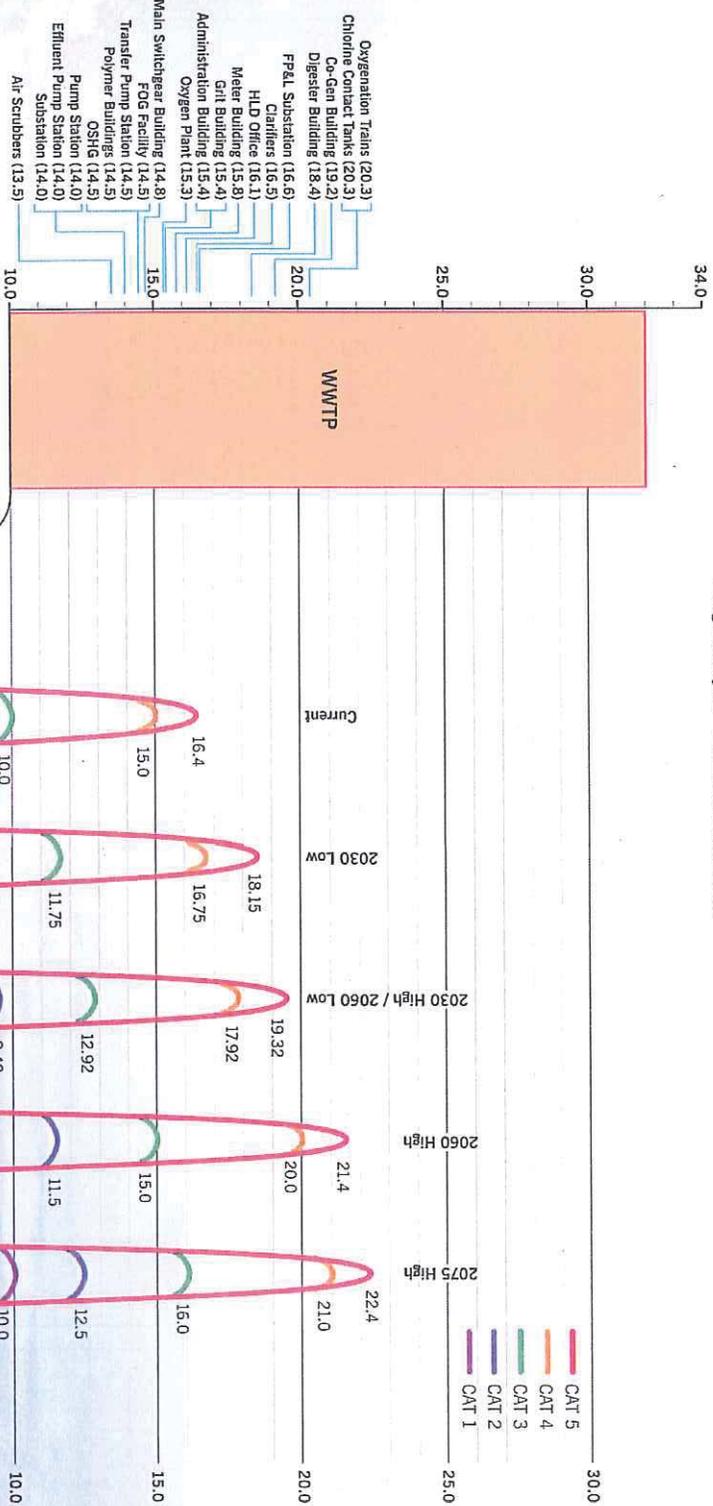
2. Surge values represent a direct hit at the plant.

CDWWTP is in Flood Zone AE (10)

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SDWWTP Storm Tide Analysis

South District Wastewater Treatment Plant
Surge Analysis - All Storm Conditions



1. Values shown indicate anticipated coastal storm tide, average storm surge for each category storm, sea level rise, and surge mitigation from the presence of mangroves which diminishes over time as sea level increases.
2. Surge values represent a direct hit at the plant.

SDWWTP is in Flood Zone AE (10)

Facilities Impacted By Storm Tide

Building level evaluation for impacts/flooding due to storm tide from a Category 5 event.

Wastewater Treatment Plant		Scenario					
Building	Current Elevation (NGVD 1929)	Current 15.4 feet NGVD 1929	2030 low 17.15 feet NGVD 1929	2030		2060 High 20.4 feet NGVD 1929	2075 High 21.4 feet NGVD 1929
				High/2060 Low 18.32 feet NGVD 1929	Low 18.32 feet NGVD 1929		
NDWWTTP Elevation Data							
Pre-Treatment & Sludge Transfer Station	--	--	--	--	--	--	--
Upper Level	32	--	--	--	--	--	--
Lower Level	11.5	X	X	X	X	X	X
Grit Building	33.38	--	--	--	--	--	--
Primary Clarifiers 1-6 – Top of Wall	26.33	--	--	--	--	--	--
Primary Sludge Pump Station 1,2	--	--	--	--	--	--	--
Floor	20	--	--	--	--	X	X
Lower Level	4	X	X	X	X	X	X
Oxygen Production Facility 1, 2	10.33	X	X	X	X	X	X
Oxygenation Train 1-6 Top of Deck	25.3	--	--	--	--	--	--
Secondary Clarifiers 1-12 – Top of Wall	18.33	--	--	--	X	X	X

Cost Impacts of Storm Surge

■ Assumptions

1. Plant Structures Are Not Destroyed
2. Mechanical Equipment is Not Destroyed
3. 90% of Affected Electrical is Destroyed
4. 100% of Affected Instrumentation is Destroyed

Full Plant Replacement: Cost with Electrical and I&C Losses

Treatment Plant	Permitted Capacity (MGD)	Estimated Replacement Cost	Electrical Cost (15% of Replacement)	I&C Cost (10% of Replacement)	Electrical LOSS (90% Elect. Cost)	I&C LOSS (100% I&C Cost)	Total LOSS
NDWWTP	120	\$ 2,400,000,000	\$ 360,000,000.00	\$ 240,000,000.00	\$ 324,000,000.00	\$ 240,000,000.00	\$ 564,000,000.00
CDWWTP	143	\$ 2,860,000,000	\$ 429,000,000.00	\$ 286,000,000.00	\$ 386,100,000.00	\$ 286,000,000.00	\$ 672,100,000.00
SDWWTP	112.5	\$ 2,250,000,000	\$ 337,500,000.00	\$ 225,000,000.00	\$ 303,750,000.00	\$ 225,000,000.00	\$ 528,750,000.00
TOTAL	375.5	\$ 7,510,000,000	\$ 1,126,500,000	\$ 751,000,000	\$ 1,013,850,000	\$ 751,000,000	\$ 1,764,850,000

Assumptions:

1. Electrical costs are 15% total capital cost, with 90% of electrical costs being a total LOSS
2. Instrumentation and control costs are 10% total capital cost, with 100% of I&C costs being a total LOSS
3. Replacement cost \$ 20.00 per gallon/day

% Loss = 23.5%

Consent Decree Projects: Estimated Electrical and I&C Losses

Capital Project Name	Estimated Total Project Cost	Electrical LOSS (90% of Electrical Cost) ¹	I&C LOSS (100% of I&C Cost) ²	Electrical LOSS (15% of Electrical Cost) ³	I&C LOSS (30% of I&C Cost) ³	Total LOSS
South District Wastewater Treatment Plant						
SUBTOTAL	\$ 154,476,069.00	\$ 19,696,204.22	\$ 8,507,208.90	\$ 997,808.85	\$ 1,330,411.80	\$ 30,531,633.77
Central District Wastewater Treatment Plant						
SUBTOTAL	\$ 596,338,295.00	\$ 89,491,659.44	\$ 52,390,937.60	\$ 1,157,743.51	\$ 1,543,658.01	\$ 144,583,998.55
North District Wastewater Treatment Plant						
SUBTOTAL	\$ 270,529,816.00	\$ 40,678,832.21	\$ 21,602,863.80	\$ 715,002.19	\$ 953,336.25	\$ 63,950,034.44
TOTAL of all 3 WWTPs	\$ 1,021,344,180.00	\$ 149,866,695.86	\$ 82,501,010.30	\$ 2,870,554.55	\$ 3,827,406.06	\$ 239,065,666.76

% Loss = 23.4%

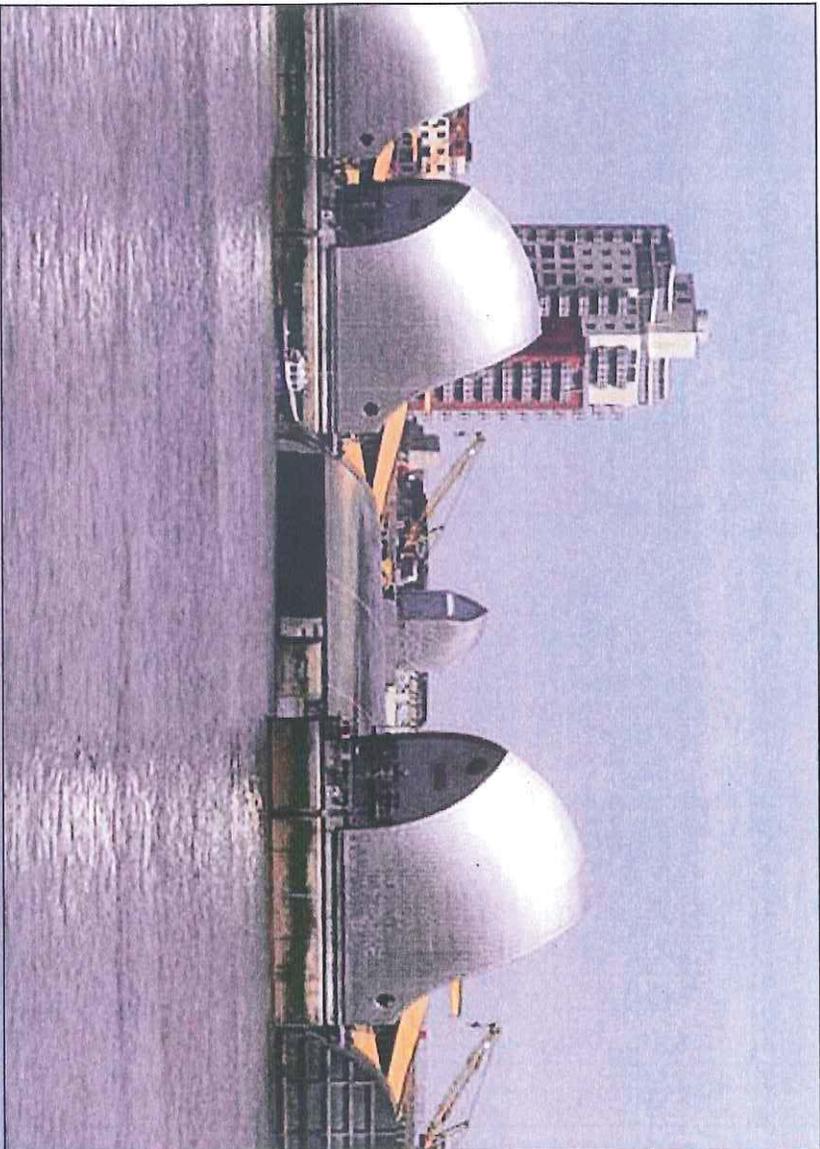
- Assumptions:
1. Electrical costs are 15% total capital cost, with 90% of electrical costs being a total LOSS
 2. Instrumentation and control costs are 10% total capital cost, with 100% of I&C costs being a total LOSS
 3. For structures with elevated equipment (mechanical, electrical, loss is reduced to 15% and 30% for Electrical and I&C respectively
 4. Projects not expected to be significantly impacted by SLR with storm surge, removed from loss expectation
 5. Study confined to WWTP facilities only
 6. Minimal structural damage to existing facilities
 7. Moderate damage to mechanical components, that could be repaired/replaced by WASD staff/resources

Mitigation Alternatives

- Large Scale Surge Barriers
- Move the WWTP
- Plant Level Barriers
- Asset Level Barriers/Mitigation
- Raise Equipment Levels
- Plug Drains, Sanitary Sewers, Wall Penetrations, Electrical Conduits

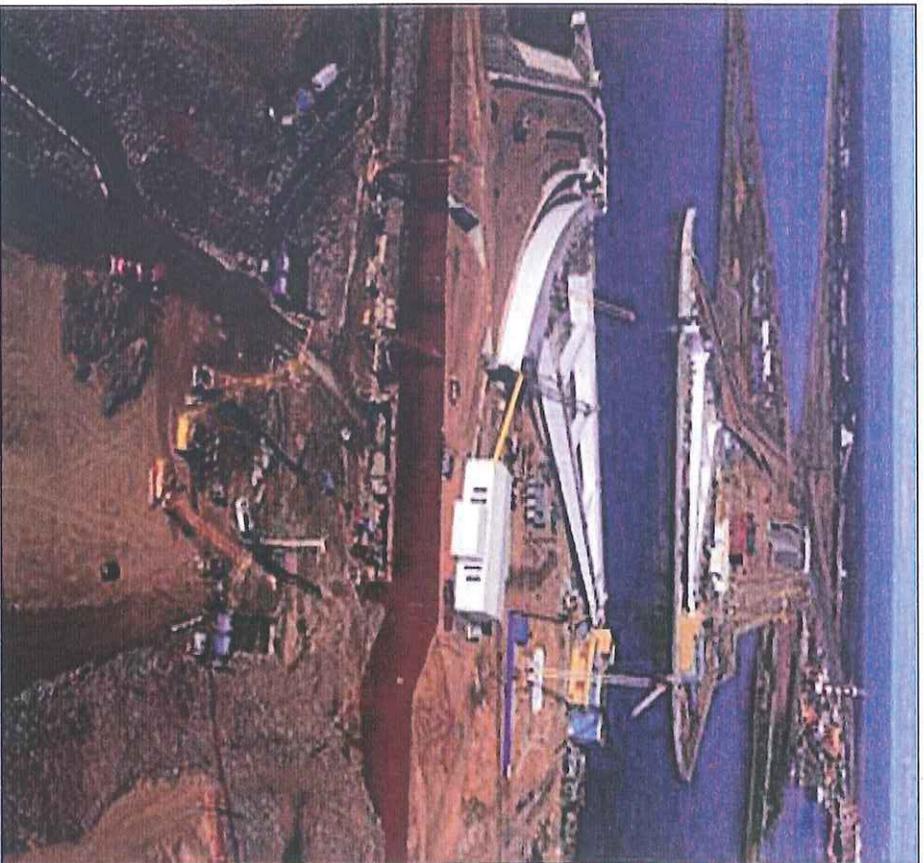
Thames storm surge barrier

- \$700 million (1982)
- \$1.7 Billion (2013, ENR)



St. Petersburg, Russia Storm Surge Barrier

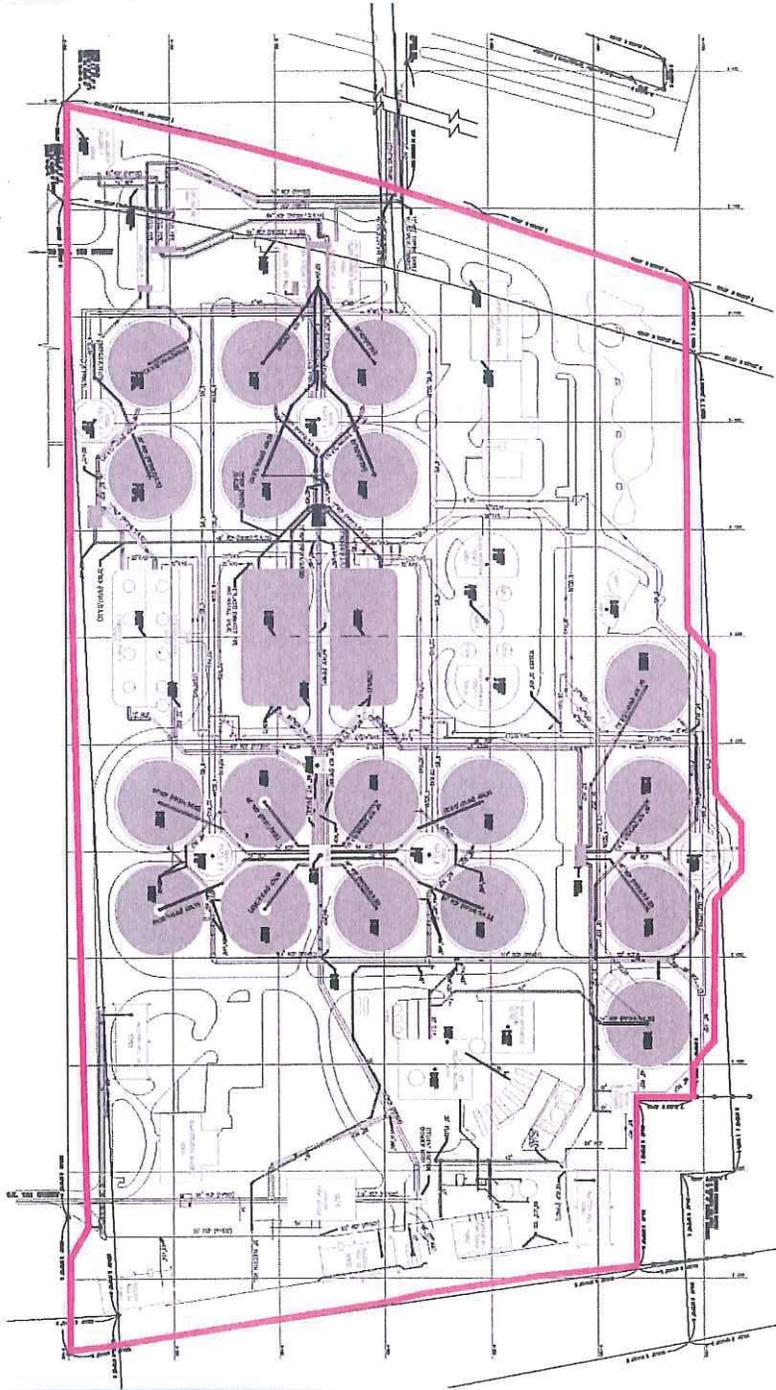
- \$3.85 Billion (2011)



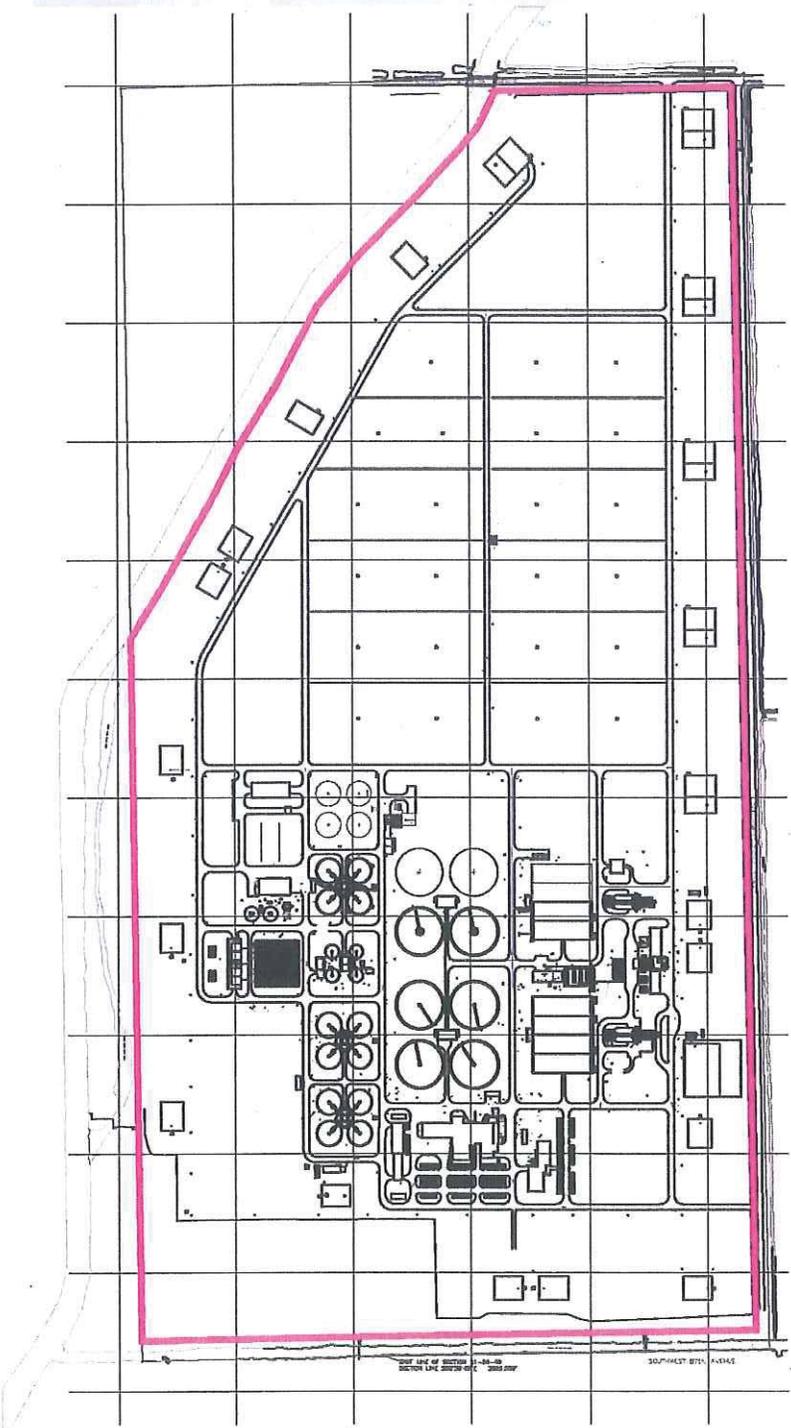
Move CDWWTP

- WWTP
 - 143 MGD = \$1.5-3.0 Billion
- Abandon the Present Investment
- Higher Level of Treatment/O&M
- Transmission System
 - Shift Flow to the West = \$0.25-1.0 Billion
- Limited Disposal Alternatives – No Outfall for Emergency Operations
- Site Acquisition Permitting Issues

Plant Level Barriers – Local Surge Wall



Plant Level Barriers – Local Surge Wall

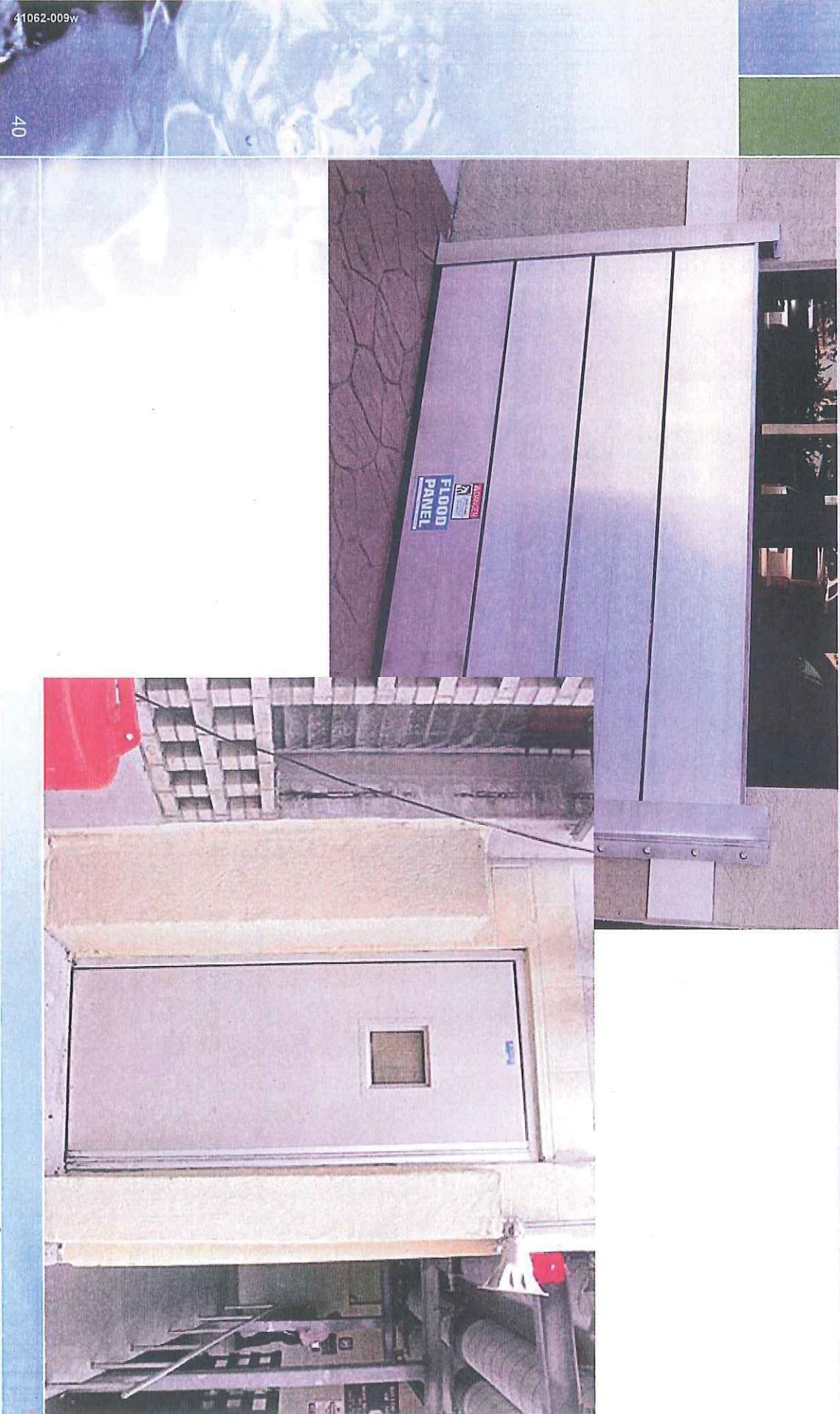


Plant Level Barriers – Estimated Costs

STATIC BARRIER						
Plant	Unit	Qty	Unit Cost	TOTAL	With 30%	
NDWWWTP	If	6,646	\$ 1,500	\$ 9,969,000	\$ 12,959,700.0	
CDWWWTP	If	7,940	\$ 1,500	\$ 11,910,000	\$ 15,483,000.0	
SDWWWTP	If	14,628	\$ 1,500	\$ 21,942,000	\$ 28,524,600.0	
Stormwater Pump Station	ea	3	\$ 15,000,000	\$ 45,000,000	\$ 58,500,000.0	
TOTAL					\$ 115,467,300.0	

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Building Specific Adaptations



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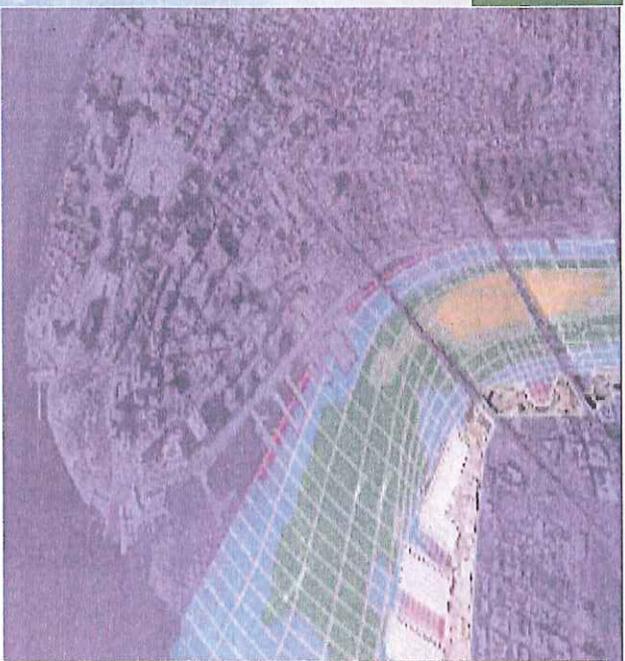
Building Specific – Estimated Costs

BUILDING/AREA HARDENING

NDWWTP	Unit	Qty	Unit Cost	TOTAL	With 30%
Concrete Walls	If	1190	\$ 1,500	\$ 1,785,000	\$ 2,320,500
Flood Logs	Sf	3100	\$ 170	\$ 527,000	\$ 685,100
Watertight Doors	ea	74	\$ 10,000	\$ 740,000	\$ 962,000
Installation of flood logs and doors (40% of cost)				\$ 506,800	\$ 658,840
SUB TOTAL					\$ 4,626,440
CDWWTP	Unit	Qty	Unit Cost	TOTAL	With 30%
Concrete Walls	If	1920	\$ 1,500	\$ 2,880,000	\$ 3,744,000
Flood Logs	Sf	4550	\$ 170	\$ 773,500	\$ 1,005,550
Watertight Doors	ea	160	\$ 10,000	\$ 1,600,000	\$ 2,080,000
Installation of flood logs and doors (40% of cost)				\$ 949,400	\$ 1,234,220
SUB TOTAL					\$ 8,063,770
SDWWTP	Unit	Qty	Unit Cost	TOTAL	With 30%
Concrete Walls	If	1440	\$ 1,500	\$ 2,160,000	\$ 2,808,000
Flood Logs	Sf	6816	\$ 170	\$ 1,158,720	\$ 1,506,336
Watertight Doors	ea	139	\$ 10,000	\$ 1,390,000	\$ 1,807,000
Installation of flood logs and doors (40% of cost)				\$ 1,019,488	\$ 1,325,334
SUB TOTAL					\$ 7,446,670
TOTAL					\$ 20,136,880

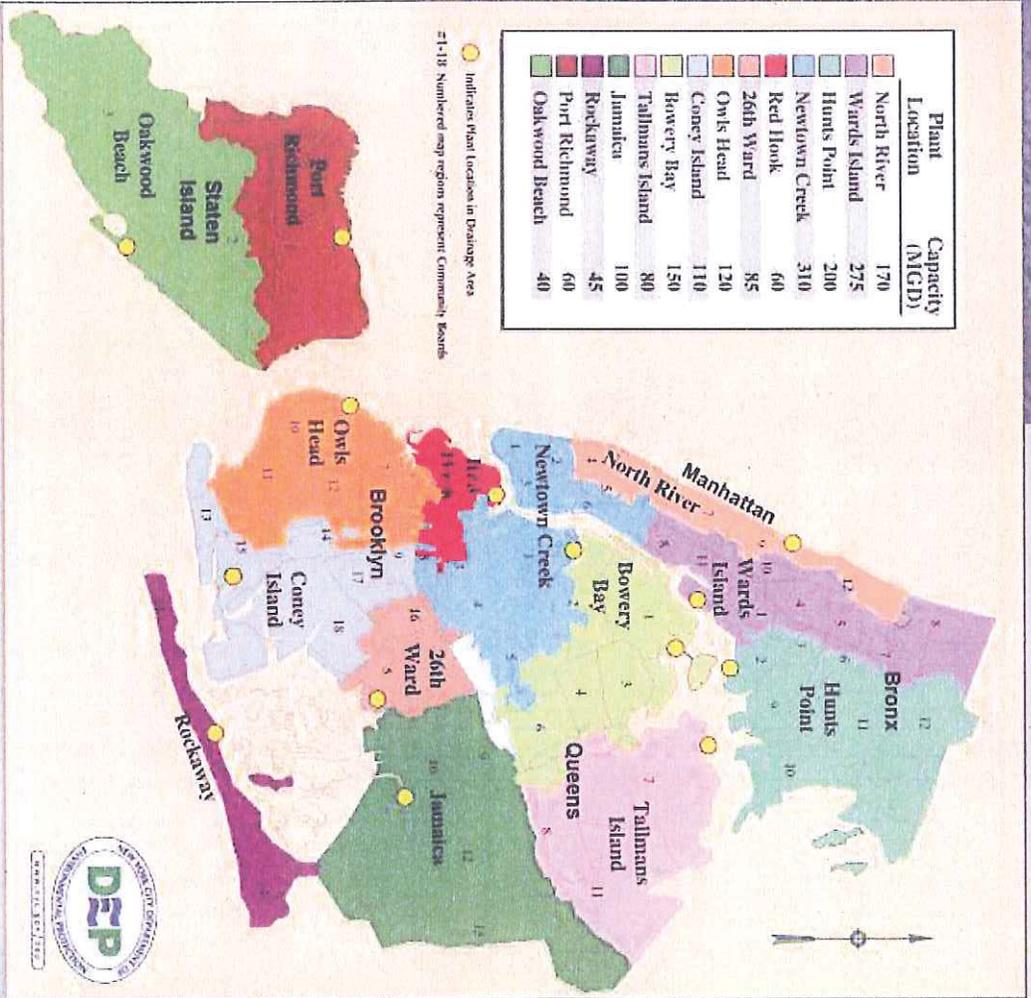
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H&S is doing a similar evaluation for NYC



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Conclusions

1. Based on the Worst Case Scenario, Storm Tide Would Inundate all of the WWTPs
2. The Impacts of Sea Level Rise Result in Minimal Additional Cost
3. Flooding will have Greatest Impact on Electrical and Instrumentation
4. The Current Risk has been Present Since the WWTPs were Constructed.

Conclusions and Recommendations

1. Consensus on Storm Tide Criteria
2. Perform Equipment (Asset) Level Analysis
3. Evaluate Mitigation Alternatives
4. Select Mitigation Projects
5. Continue Hardening Program
 - a. Complete Easily Implemented Projects
 - b. Resolve Issues Related to Consent Decree Program
 - c. Develop Spare and Stored Parts for Critical At-Risk Equipment
 - d. Complete Remaining Mitigation Projects

Discussion

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