City of Naples

BASIN ASSESSMENTS

January 2024

Prepared for:

The City of Naples

Prepared by:

Kimley-Horn and Associates, Inc.
Registry No. 35106

Kimley»Horn
Expect More. Experience Better.

Basin Assessments

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STATE OF FLORIDA,
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THIS IS TO CERTIFY THAT THE ENCLOSED ENGINEERING CALCULATIONS WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION.

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List of Abbreviations

Abbreviation	Definition
CIP	Capital Improvement Program
DCIA	Directly Connected Impervious Area
DEM	Digital Elevation Model
EOPC	Engineer's Opinion of Probable Cost
ERP	Environmental Resource Permit
FDOT	Florida Department of Transportation
FDEP	Florida Department of Environmental Protection
FLUCCS	Florida Land Use and Land Cover Classification System
HSG	Hydrologic Soil Group
ICPR4	Interconnected Pond Routing Version 4
LOS	Level of Service
NEXRAD	Next Generation Weather Radar
NAVD	North American Vertical Datum
NGVD	National Geodetic Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resource Conservancy Service
SCS	Soil Conservation Service
SFWMD	South Florida Water Management District
SWMP	Stormwater Master Plan
TC	Time of Concentration

1. Introduction

1.1. Project Overview

Kimley-Horn and Associates, Inc. (Kimley-Horn) was retained by the City of Naples (City) under a Consultant's Agreement for Professional Services under the Request for Proposal (RFP) #21-033 for Professional Services dated August 24, 2021. This agreement is for the development of stormwater basin assessments. The basin assessments were intended to analyze the impacts from rainfall and sea level rise and complete analyses to support the City in planning for its stormwater Capital Improvement Program (CIP) for the short-term, medium-term, and long-term.

The City identified five areas (A, B, C, D, and E) within City limits that are known to be vulnerable to flooding or have water quality concerns. These are the five Assessment Areas that were the subject of this study. The extents of the City and Assessment Areas are seen below in ***Figure 1-1***.

Figure 1-1 City of Naples Extents

1.2. Project Goals

The City outlined goals for the five basin assessments in the RFP document. These goals included:

- Protection of the health, safety, and welfare of City of Naples residents
- Protection of and improvement to the City's surface and ground water resources
- Protection of public and private property
- Protection and restoration of ecology
- Planning for wise and strategic stormwater management system investments
- Planning for sustainability and resiliency relating to anticipated climate change

With all of these goals in mind, this study aims to provide the City with recommendations to alleviate flooding in existing conditions (Improvement Alternatives) and an anticipated future condition (Long-Range Resilient Alternatives). In addition, this study provides budget estimates and phasing recommendations for the proposed alternatives.

1.3. Project Approach

Kimley-Horn collected and reviewed data from various sources throughout the City. Based on this review, a data gaps analysis was performed to determine what additional data would need to be collected. Field verification and survey was completed to collect infrastructure data. This data collection is described in more detail in ***Section 2 Data Collection, Review, and Processing*** of the report. Early in the project, a Model Recommendations Technical Memorandum was prepared to coordinate and document specific methodologies. This memorandum, dated May 2022, is included in this report in ***Appendix C – Supporting Documentation***.

Using the collected data and the methodologies proposed in the memorandum, a hydrologic and hydraulic model to simulate existing conditions and flood results due to rainfall events was created. The process of creating this model from the collected data and methodology is outlined in ***Section 3 Existing Conditions Analysis*** of the report. Using the results of the existing conditions model, Kimley-Horn developed a series of alternatives and corresponding models that simulated projects aimed at reducing flooding throughout the Assessment Areas. ***Section 4 Alternatives Analysis*** of the report outlines the process of how alternatives were identified and implemented in the existing model.

Kimley-Horn then performed a future conditions analysis which created a series of models to understand future conditions, potential improvements to improve resiliency, and the effectiveness of those improvements. To do this the following conditions were simulated: baseline future conditions, existing condition improvement alternatives modeled under future conditions, Long-Range Resilient Alternatives modeled under future conditions, and Long-Range Resilient Alternatives modeled under existing conditions. Each step of the future conditions analysis is outlined in ***Section 5 Future Conditions Analysis***.

Based on the results of the modeling and other project considerations, a Final Alternative was chosen. For this alternative, a final layout, costs, and benefit were calculated. The methodology for calculating these is outlined in ***Section 6 Benefit and Cost Analysis***. Based on the findings of the study, a list of Capital Improvement Plan recommendations was generated for each Assessment Area. These recommendations, which are separated into short, medium, and long-term, are included in ***Section 7 Capital Improvement Plan Recommendations***. This section of the report also includes a section regarding funding opportunities.

1.4. Overview of Assessment Areas

1.4.1. Assessment Area A

Assessment Area A is the northernmost of the Assessment Areas and is isolated from the rest of the Assessment Areas. It is bordered to the east by Tamiami Trail N and to the west by Venetian Bay near Crayton Road and the associated residential areas. This assessment area is at a higher elevation along Tamiami Trail and generally drains east to west. At the center of the assessment areas are Devils Lake and Swan Lake. Most of the residential areas within Assessment Area A as well as some commercial area along Tamiami Trail N drain to the lakes. Many streets west of Crayton Road do not discharge to the lakes but drain directly to Venetian Bay. The lakes discharge via control structures that contain boards that can be removed so that the lakes can operate at different elevations. The Assessment Area extents and features described can be seen in ***Figure 1-2***.

Figure 1-2 Assessment Area A

1.4.2. Assessment Area B

Assessment Area B is located south of 5th Ave S, north of 10th Ave S, and east of 8th St S. This area has a mix of commercial and residential developments that drain to low-lying roadway intersections that contain stormwater infrastructure. Much of the infrastructure then drains to an offsite stormwater pump station, called the Cove Pump Station. The Cove Pump Station also serves a portion of Assessment Area C and some offsite area. There are some portions of Assessment Area B that discharge directly to Naples Bay to the east, namely along 10th St S and 11th St S. The Assessment Area extents and features described can be seen in ***Figure 1-3***.

Figure 1-3 Assessment Area B

1.4.3. Assessment Area C

Assessment Area C has two distinct drainage areas, each with its own stormwater infrastructure systems and outfalls. The eastern portion of the Assessment Area (east of 3rd St S) primarily discharges to Broad Ave and is served by the Cove Pump Station, which discharges to Naples Bay. The existing Cove Pump Station also serves Assessment Area B, the roads connecting Assessment Areas B and C, and a series of offsite basins to the northwest of Assessment Area C. Some parts of Assessment Area C are served by some small pipes that discharge directly to a canal leading to Crayton Cove at the southern end of the Assessment Area, such as along 14th Ave S. The western portion of the Assessment Area (west of and including 3rd St S) drains east to the canal that leads to Crayton Cove by gravity pipe flow. Both distinct drainage areas are bordered along the north by 12th Ave S and along the south by 14th Ave S. The Assessment Area extents and features described can be seen in ***Figure 1-4***.

Kimley»Horn

Figure 1-4 Assessment Area C

1.4.4. Assessment Area D

Assessment Area D is bordered by Goodlette-Frank Rd to the east, Central Ave to the south, 9th St N to the west, and 6th Ave N to the north. There is a 54-inch diameter pipe that discharges from a large 160-acre basin west of 9th St N into the Assessment Area. This large basin has no other structural outfall other than through the Assessment area D. This pipe then discharges through the center of the Assessment Area, where there is a Florida Power and Light (FPL) facility, and then across Goodlette-Frank Rd to a pump station (Public Works Pump). Stormwater infrastructure along 10th St N discharges through the FPL site to the Public Works Pump. A portion of Central Ave and 5th Ave N discharge to 10th St N, while most of the area of these roads discharge east to Gordon River. The Assessment Area extents and features described can be seen in ***Figure 1-5***.

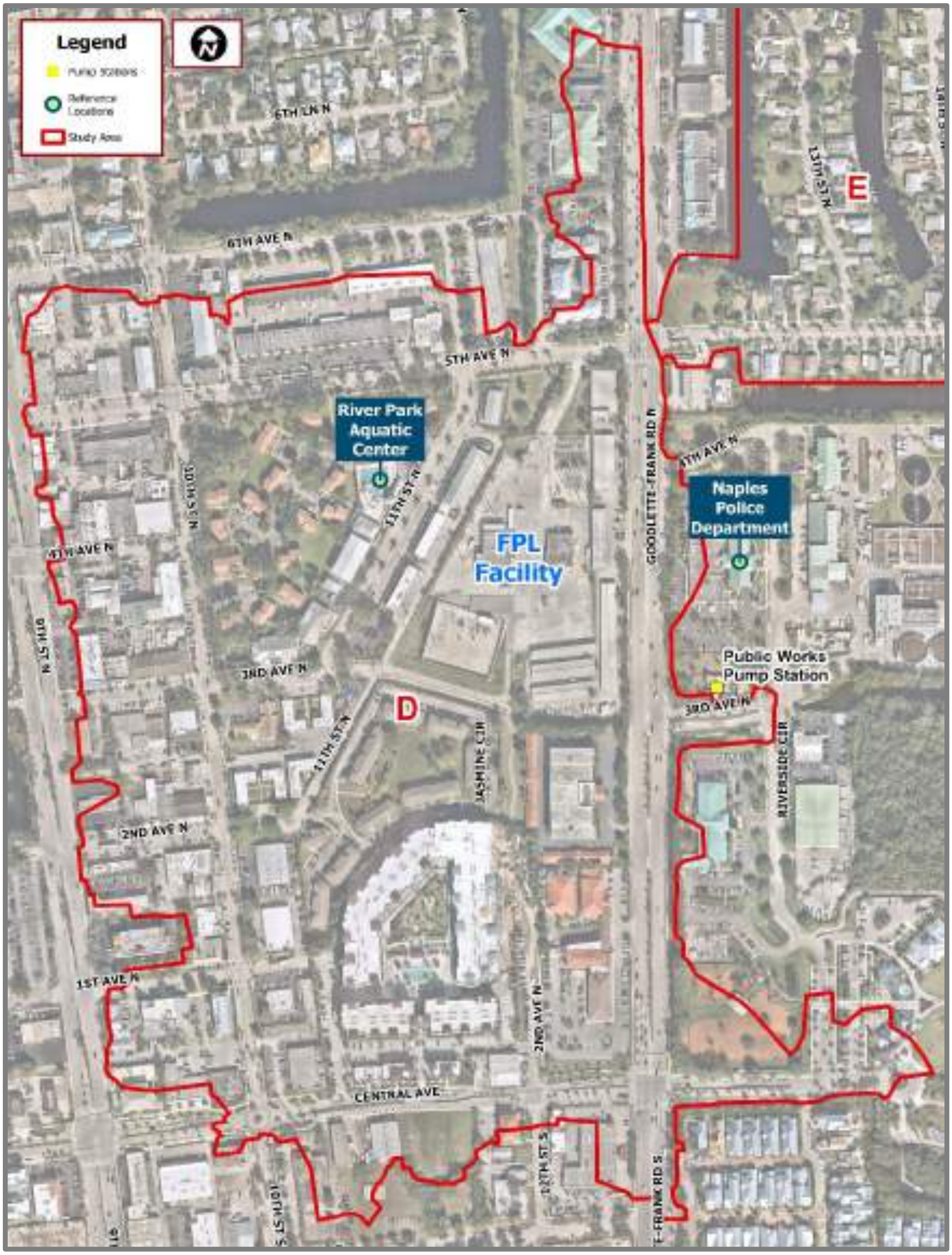

Figure 1-5 Assessment Area D

1.4.5. Assessment Area E

Assessment Area E is bisected by the Gordon River and separated into distinct eastern and western portions. The eastern portion is to the west of the Naples Airport and is bordered by North Rd on the east. The western portion includes the portion of 5th Ave N east of Goodlette-Frank Rd and Charlie C. Anthony Park. Stormwater infrastructure within this Assessment Area consists of direct connections from the residential roadways within the area to the Gordon River. The Assessment Area extents and features described can be seen in ***Figure 1-6***.

Figure 1-6 Assessment Area E

Due to the interconnectivity of stormwater infrastructure in Assessment Areas B, C, D, as well as the proximity of Assessment Area D to E, these four assessment areas were combined into one model for much of the study. This resulted in two existing condition models. The “North” model includes Assessment Area A, and the “South” model includes Assessment Areas B, C, D, and E. The development of these models is discussed in more detail in ***Section 3 Existing Conditions Analysis***.

2. Data Collection, Review, and Processing

2.1. Introduction

The first task completed was data collection. This included data collection and review. Data was either collected from the City or Collier County or was downloaded. Available data was reviewed against data needs to determine data gaps. This data gaps analysis is discussed in more detail in ***Section 2.2.4.2 Data Gaps Analysis.*** To supplement the available data, field work was conducted by Kimley-Horn and survey data collection was conducted by WGI, Inc. All relevant data collected was compiled and provided to the City through the Project Management Website. A log of all data collected is included in ***Appendix A – Data Collection***. Data collection efforts are summarized in the report below.

2.2. Summary of Data Collection, Review, and Processing

2.2.1. Topographic Data

A Digital Elevation Model (DEM) developed based on 2018 LiDAR data was obtained from National Oceanic and Atmospheric Administration (NOAA). Four available DEM raster tiles were mosaiced into a single DEM. The original data was obtained in meters but was converted to feet. The DEM is in the North American Vertical Datum of 1988 (NAVD88). All elevations included in this report are in NAVD88 unless otherwise noted. Ground elevations within the Assessment Areas range from approximately 0.5 feet to 20 feet. ***Figure 2-1*** and ***Figure 2-2*** show the DEM and range of elevations for all of the Assessment Areas.

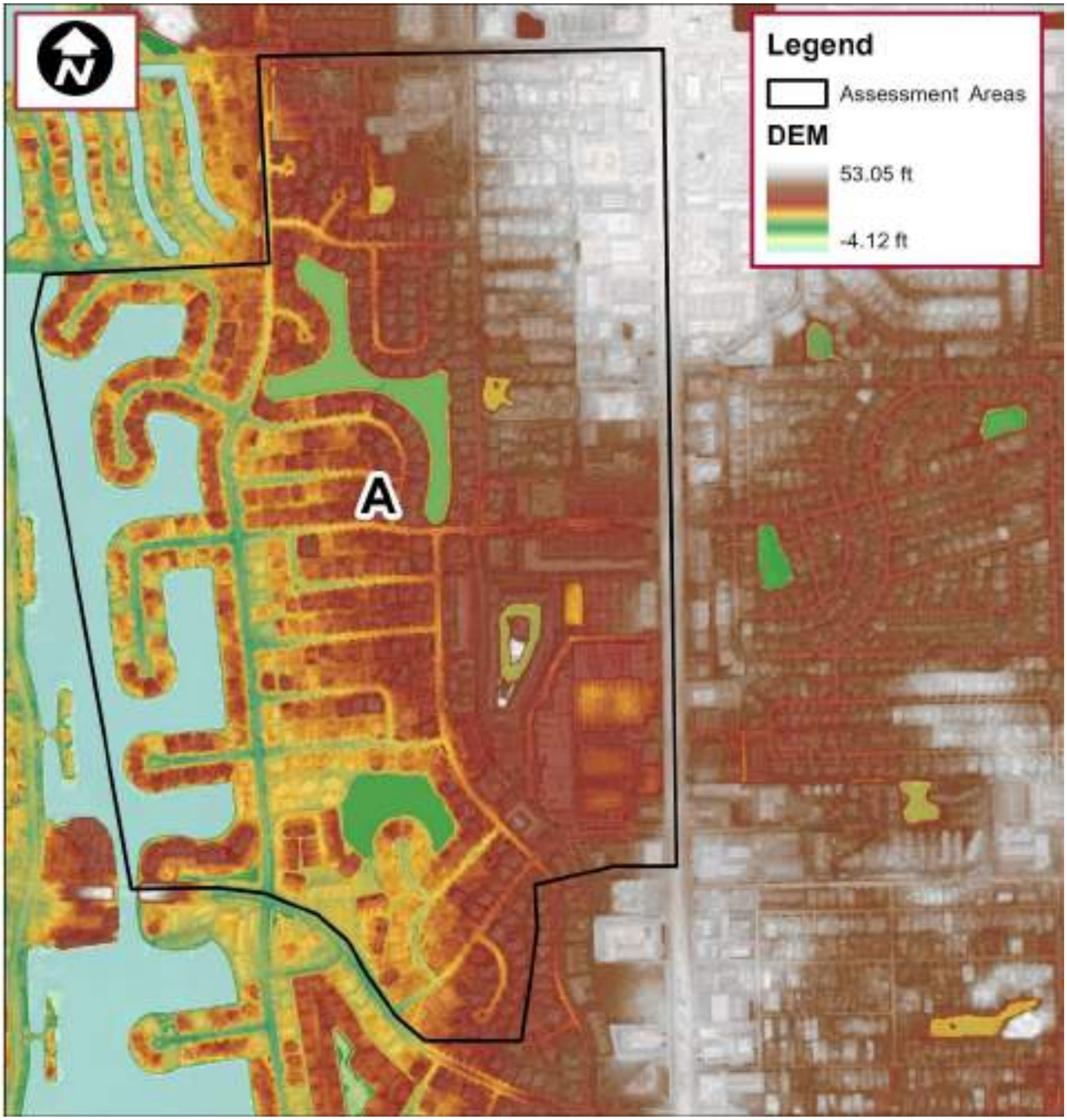

Figure 2-1 DEM Elevations in Assessment Area A

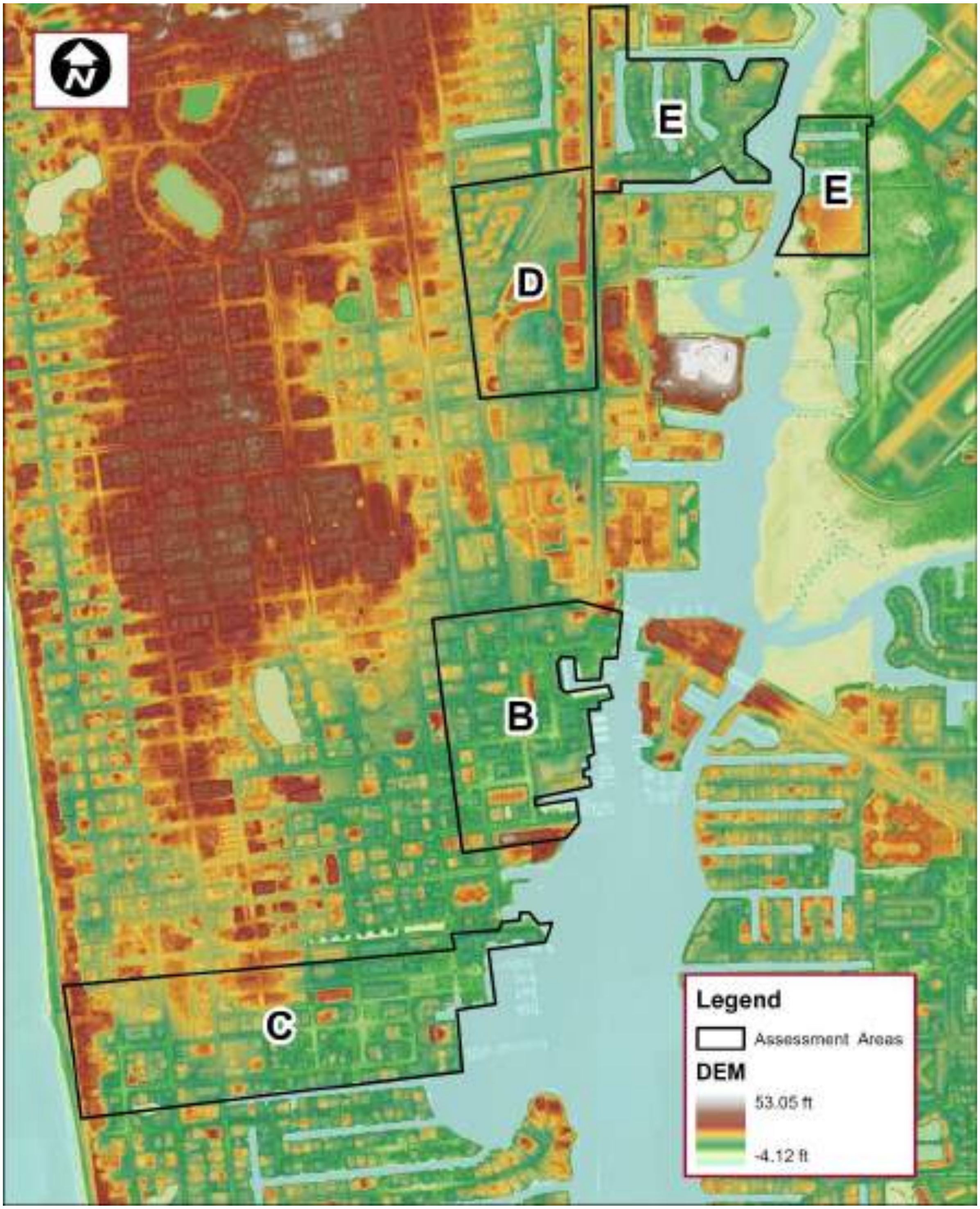

Figure 2-2 DEM Elevations in Assessment Areas B, C, D and E

A DEM is used to assign model parameters to some of the model elements. One of these model elements is overland weirs, which represent the flow between model basins. In residential neighborhoods, the roofline of the homes and the middle of the lot is typically the highest point and therefore would be assigned an overland weir to represent where water would travel between basins. However, water would only travel between homes and because of the size of the homes in the City, this can be somewhat limited. To help better represent this condition, the DEM was adjusted to add in buildings at an elevation higher than the anticipated flood stages. This results in a better representation of flow in between buildings, with no flow occurring through buildings. To modify the DEM, building footprints were obtained from an open-source Microsoft website, published March 26, 2021, and manually reviewed and adjusted as needed. ***Figure 2-3*** shows a side-by-side comparison for Assessment Area A of the original DEM and the DEM with building footprints incorporated as an example of how the topographic data was altered to incorporate the building footprints.

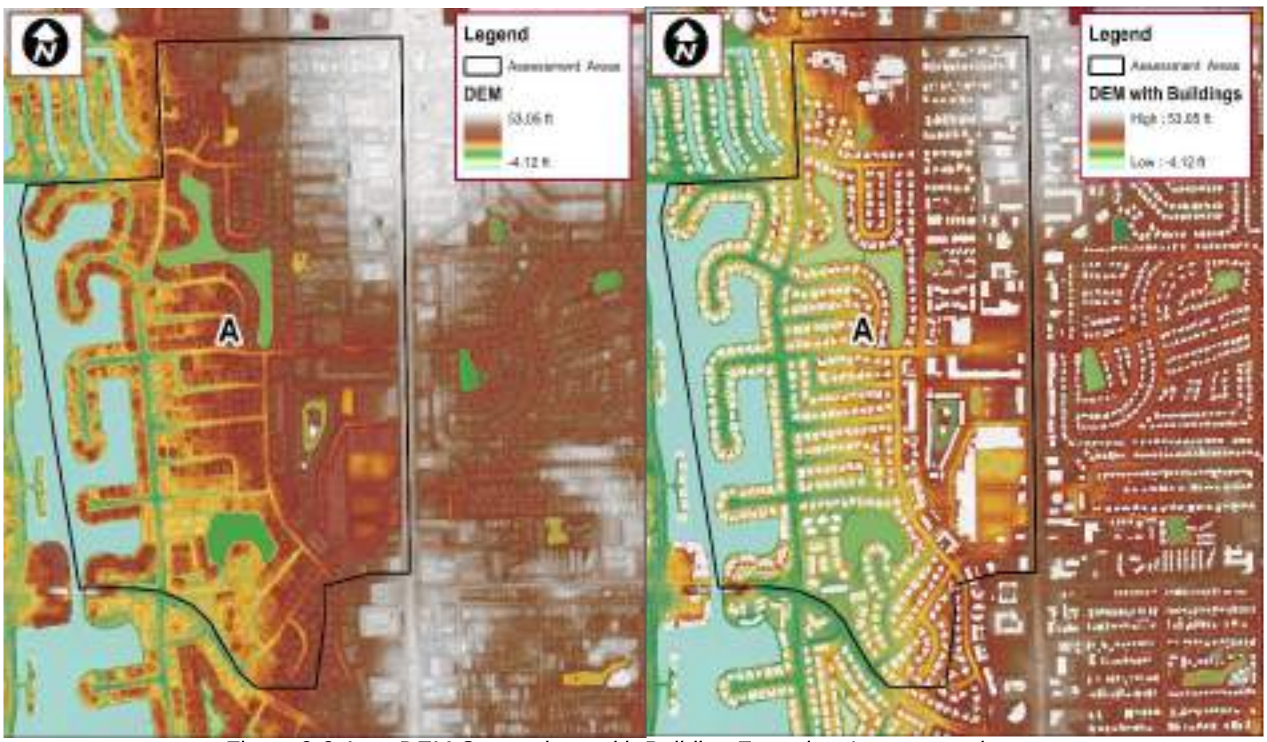

Figure 2-3 Area DEM Comparison with Building Footprints Incorporated

2.2.2. Landuse

Landuse data (dated 2017) were obtained from the Florida Department of Environmental Protection (FDEP) in the form of a Florida Landuse and Land Cover Classification System (FLUCCS) shapefile. The City is primarily developed land with a mix of commercial and residential development. The landuse was manually checked against aerial imagery to confirm that the provided classifications represent current landuse. In areas where the FLUCCS classification was not representative of the existing landcover, a new classification was manually assigned. This review was not meant to be exhaustive, but to capture areas where there were clear deviations from existing landuse.

Assessment Area A is primarily residential with non-residential land along Tamiami Trail N. Assessment Areas B and D are primarily non-residential with some residential lots. Assessment Area C is a mix of commercial and residential development. Assessment Area E is primarily residential with some non-residential areas, including a park and marinas. ***Figure 2-4*** shows Assessment Area A landuse and ***Figure 2-5*** shows Assessment Areas B, C, D, and E landuse.

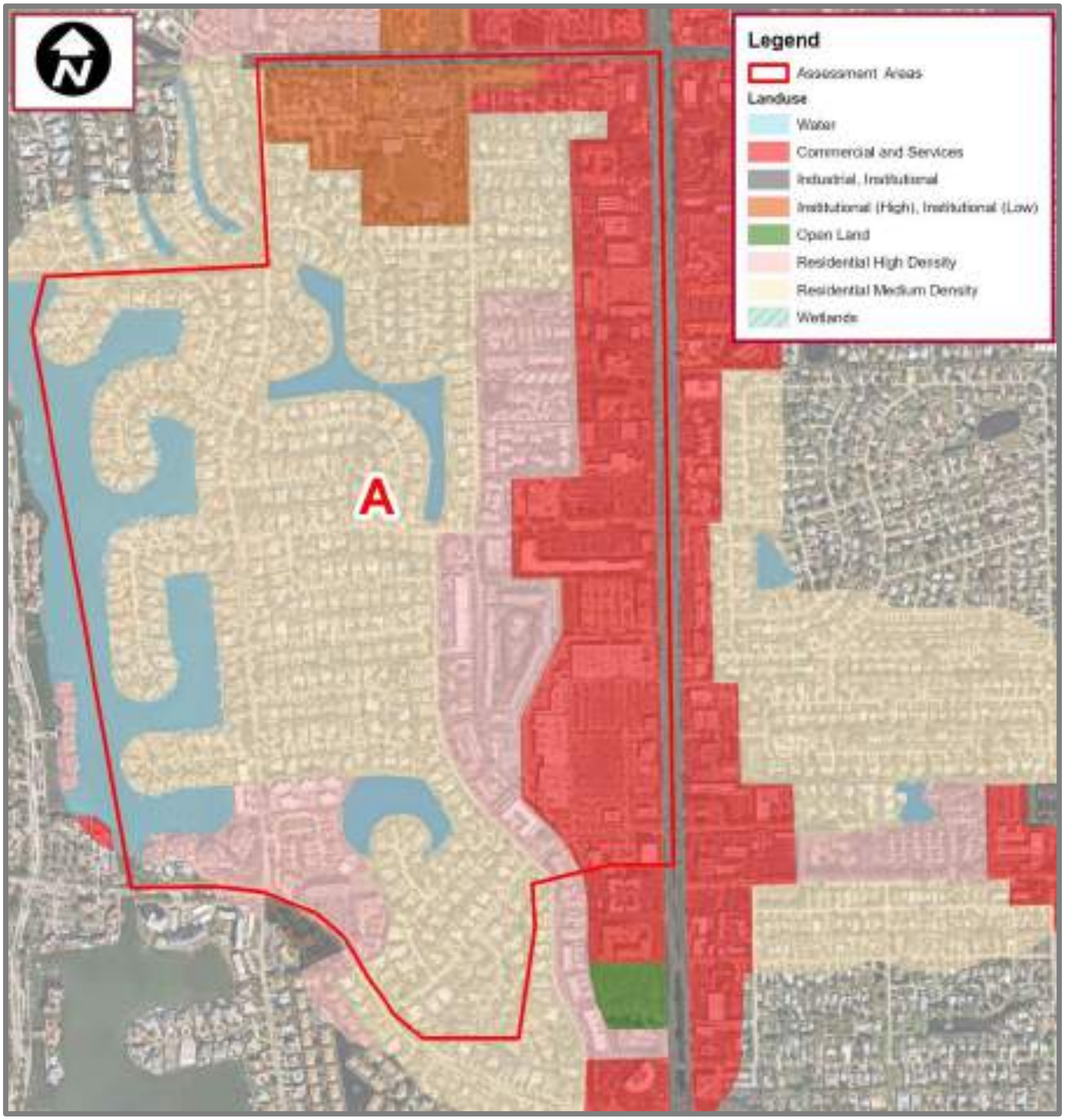

Figure 2-4 Assessment Area A Landuse

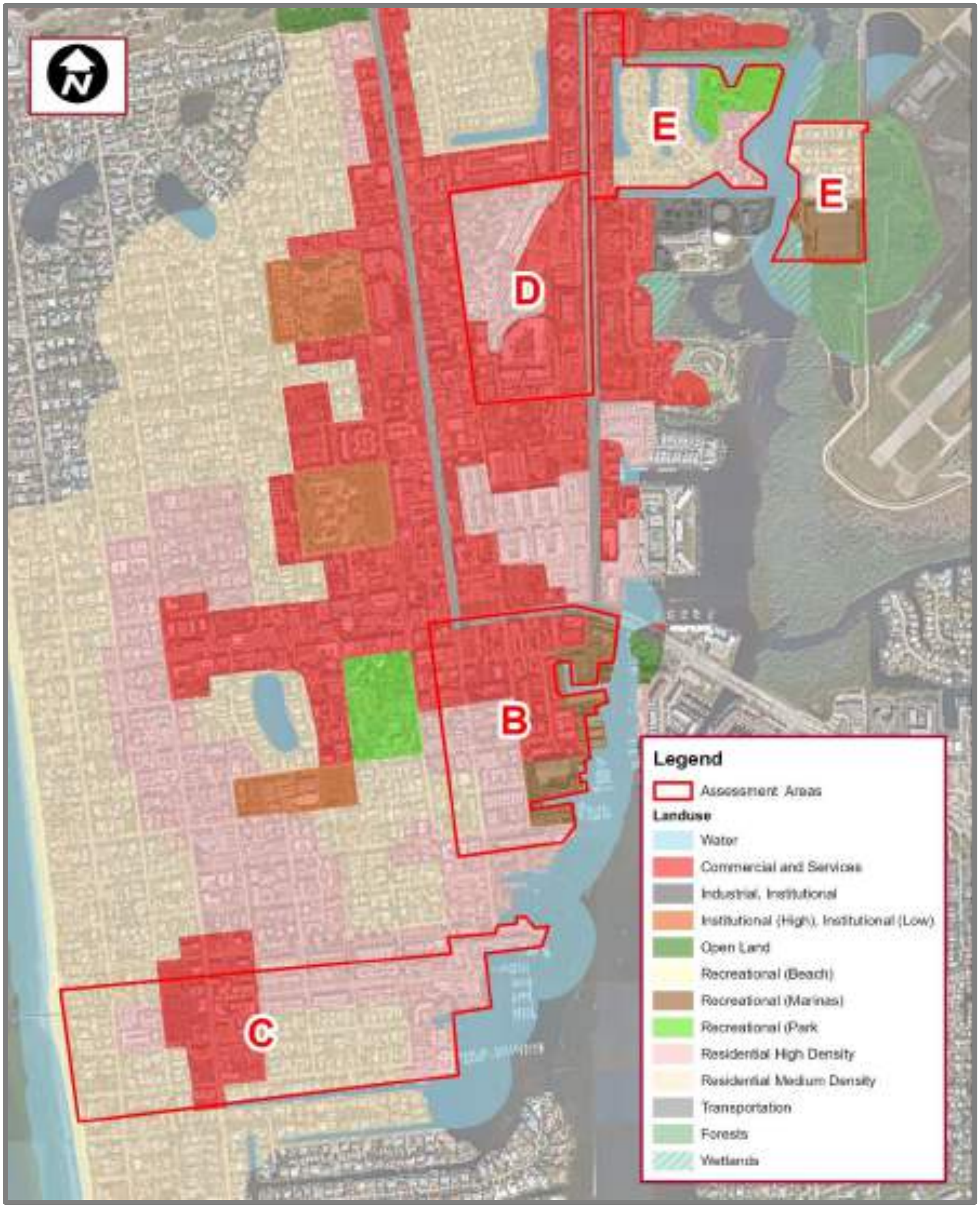

Figure 2-5 Assessment Areas B, C, D, and E Landuse

2.2.3. Soils

Soils data were obtained from the Natural Resources Conservation Service (NRCS) Web Soil Survey. While there are small areas of Hydrologic Soil Groups (HSG) A, A/D, and B/D, the vast majority of Assessment Areas A, B, C, and D are denoted as Urban Land by the NRCS (denoted with a U). Areas of water are denoted as a W. The majority of Assessment Area E is A/D soils. ***Figure 2-6*** shows the breakdown of the HSGs in Assessment Area A and ***Figure 2-7*** shows the breakdown of the HSGs in Assessment Areas B, C, D, and E.

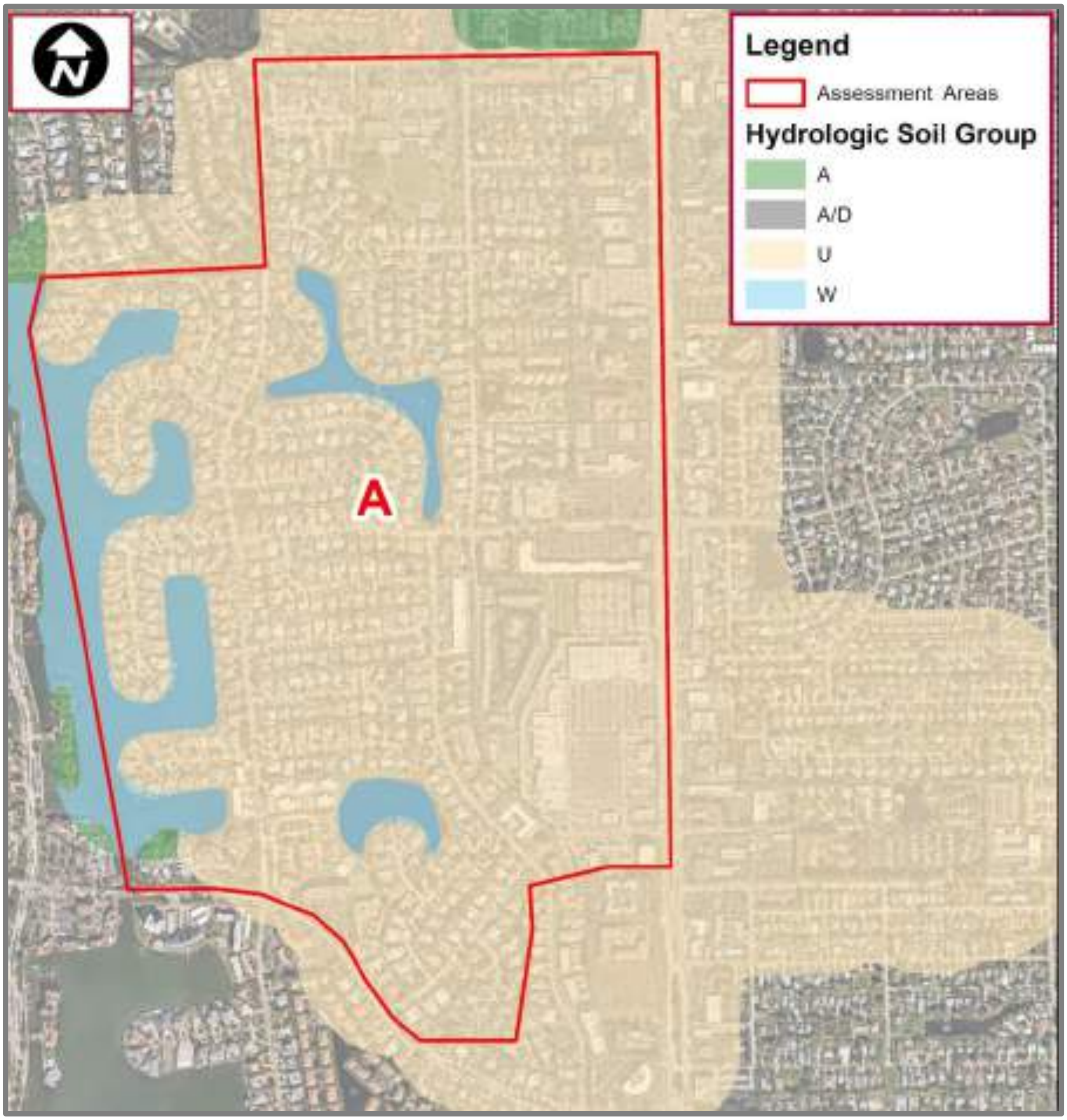

Figure 2-6 Assessment Area A Hydrologic Soil Group

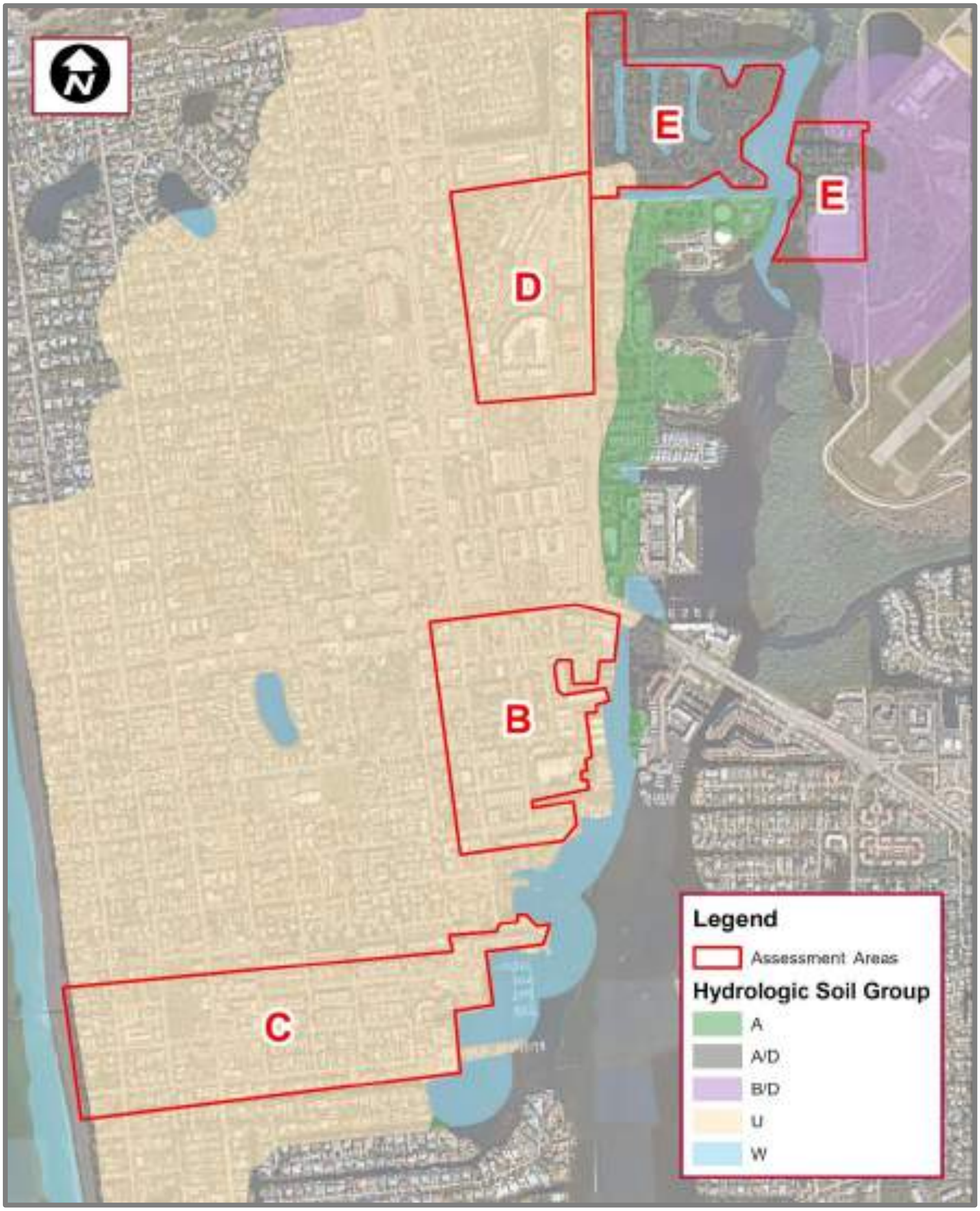

Figure 2-7 Assessment Areas B, C, D, and E Hydrologic Soil Group

2.2.4. Stormwater Infrastructure

2.2.4.1. Existing Data

As the City is heavily developed, there is an existing network of storm infrastructure that collects and conveys most stormwater runoff. A stormwater infrastructure database, containing GIS data of existing stormwater pipes, manholes, inlets, and other structures, was obtained from the City of Naples. The City infrastructure data collected for the Assessment Areas can be seen in ***Figure 2-8*** and ***Figure 2-9***. The City also provided pump curves and other infrastructure information for the existing stormwater pump stations. South Florida Water Management District (SFWMD) Environmental Resource Permit (ERP) data in the form of plans, permitted plans, and as-builts for sites around the City was downloaded as needed and as it was available. Due to the age of development and infrastructure within the City, the available ERP data in the Assessment Areas is limited.

Figure 2-8 Assessment Area A Existing Infrastructure Obtained from the City

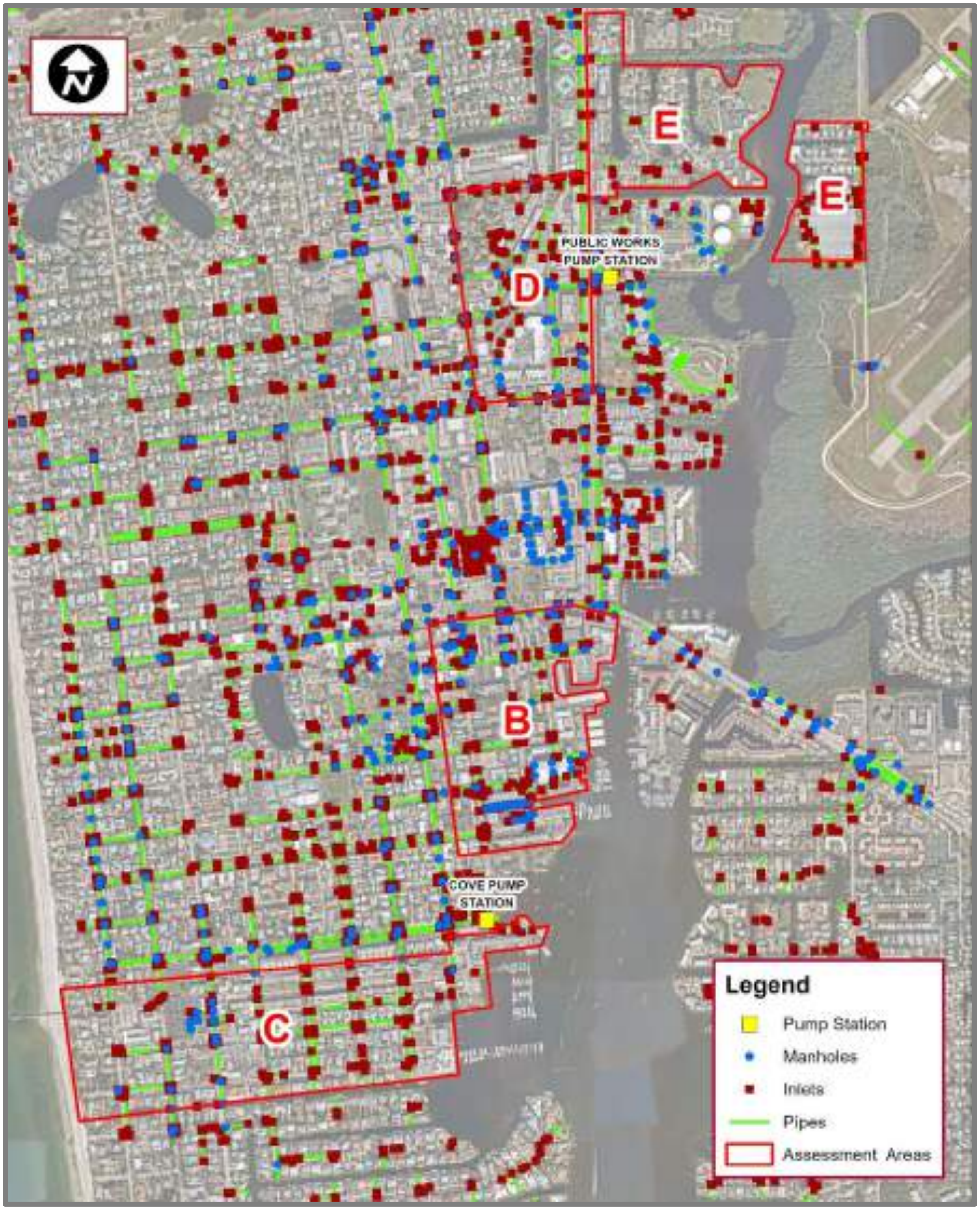

Figure 2-9 Assessment Areas B, C, D, and E Existing Infrastructure Obtained from the City

2.2.4.2. Data Gaps Analysis

Using the existing infrastructure data collected, Kimley-Horn reviewed the aerial and anticipated model features. Based on this review, Kimley-Horn prioritized the structures throughout the City for survey data collection. ***Table 2-1*** shows the resulting table and how many structures were included in each prioritization category. Field reconnaissance and survey was collected using this priority order.

Table 2-1 Data Gaps Prioritization

Priority No. (with 1 as the highest)	Count	Structure Anticipated to be Modeled	Structure within Assessment Area Boundaries	Pipe Size, Upstream Invert, and Downstream Inverts available in City GIS Data
1	366	Yes	Yes	No
2	121	Yes	No	No
3	148	Yes	Yes	Yes
4	61	Yes	No	Yes
5	265	No	Yes	No
6	136	No	Yes	Yes

2.2.4.3. Field Reconnaissance

Field reconnaissance conducted by Kimley-Horn focused on the needs identified in the Data Gaps analysis. Field reconnaissance was performed to verify or obtain information about structures such as pipe connections, pipe sizes, pipe material, and pipe end types. In total, 509 structures were field verified.

2.2.4.4. Survey

Survey data was collected by WGI, Inc. A list of structures requiring survey was provided to the surveyor and each structure was given an ID for reference. Structures included inlets, control structures, stormwater sewer manholes, and free-standing pipe ends. Where applicable, pipe inverts and sizes, slot inverts and sizes, grate elevations, and structure top elevations were collected. Pipe material was also recorded for each structure. Survey data was collected for 240 structures.

2.3. Public Meetings

A Public Involvement Plan was prepared early in the project to define the goals and objectives for public involvement. The Public Involvement Plan can be found in ***Appendix C – Supporting Documentation***. The main components of the Public Involvement Plan were an Online Engagement Website and Public Meetings.

The Online Engagement Website was designed as an interactive site that can provide information on project background and goals, summarize public meetings, and provide an informational map. Public meetings were hosted by Kimley-Horn and the City to provide residents and business owners with information about this project and provide an opportunity for the public to provide input. Kimley-Horn presented the goals of the project, a general overview of methodology, and preliminary model results. Individuals were given the opportunity to ask questions and voice concerns as well as provide feedback on modeled flooding locations. Notes from these meetings can be found in ***Appendix A – Data Collection.***

3. Existing Conditions Analysis

3.1. Introduction and Modeling Software

To simulate existing conditions in each Assessment Area, a model was developed. Interconnected Channel and Pond Routing version 4 (ICPR4) was used to develop the existing conditions model, as well as the alternative and future condition models.

ICPR4 allows users to input hydrologic and hydraulic parameters to create a stormwater model where hydrology and hydraulics are both incorporated in the same model. For hydrology, ICPR4 uses a given unit hydrograph, rainfall distribution, and Soil Conservation Service (SCS) methodology to determine a runoff rate and volume per basin. It then simulates the hydraulic components of the system through the flow of stormwater between interconnected drainage basins using links that represent physical conveyance such as overland flow, pipes, drop structures, and pumps while accounting for storage in the system. The below report sections outline the development of these model elements and the resulting simulated flood stages.

3.2. Model Recommendation Technical Memorandum

A technical memorandum describing the methodology to determine design storm intensities, tailwater conditions, landuse, and other model parameters for the existing conditions analyses was prepared for the City in January 2022 and finalized in July 2022. The memorandum also covers level of service (LOS) criteria used for the alternatives analyses. The full technical memorandum is attached to this report and can be found in ***Appendix C – Supporting Documentation***. The Model Recommendation Technical Memorandum also included details on development of the future conditions analysis, which is covered in more detail in ***Section 5 Future Conditions Analysis***.

3.3. Existing Conditions Model Development

3.3.1. Model Schematic

3.3.1.1. Basins

The DEM, City infrastructure data, ERP permit data, and data collected during survey and field reconnaissance were used to delineate basin boundaries to reasonably represent stormwater runoff conveyance and storage within each Assessment Area. Basin boundaries follow the ridgeline between lower lying areas.

Because the City desired to understand how large pipes throughout each assessment area would need to be upsized to achieve specific LOS goals, it was determined that most inlets would have their own basin. In locations where it seemed reasonable that a downstream pipe size could be used to assign an upstream pipe size, multiple inlets may have been included in one basin.

Early in the project, it was found that large areas outside of the Assessment Areas either drain into the Assessment Areas or into infrastructure that connects to infrastructure in the Assessment Areas. These areas were included in the model, but at a much broader scale to better capture runoff and therefore peak stages and flow through the Assessment Areas.

There are a total of 204 basins in the North model and 283 basins in the South model with sizes ranging from approximately 0.1 acres to 160.0 acres. Each basin was assigned a unique name. ***Figure 3-1*** shows the North model basins and ***Figure 3-2*** shows the South model basins.

Figure 3-1 North Model Existing Condition Basins

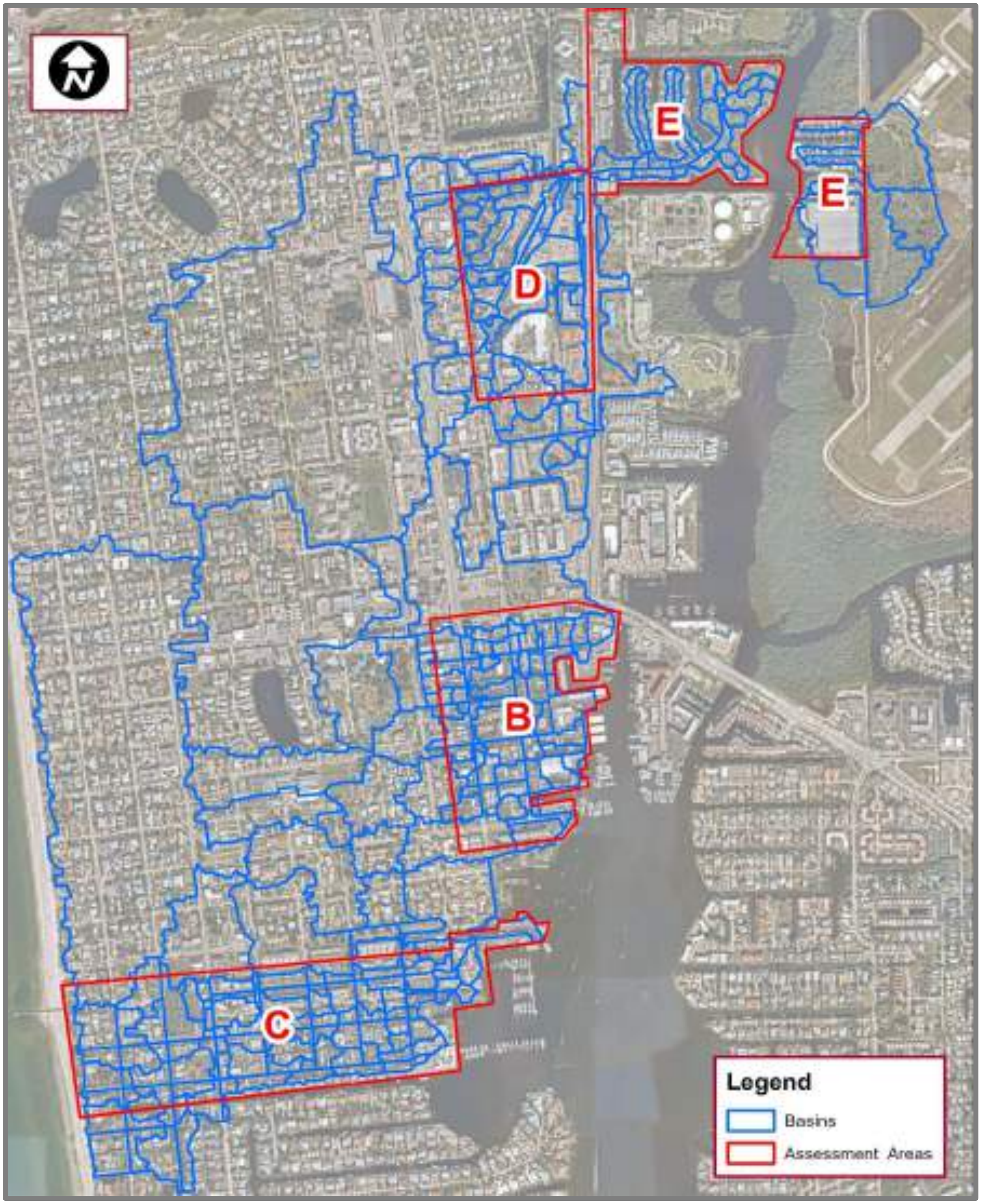

Figure 3-2 South Model Existing Condition Basins

3.3.1.2. Nodes

Three types of nodes were assigned within the model. These included loading nodes, junction nodes, and boundary nodes. A loading node was placed for each basin within the study area. Loading nodes represent the storage for their respective basin and were placed where runoff from that basin would be routed for storage prior to link flow. Junction nodes, which represent manholes or other physical junctions where multiple pipes intersect, were placed throughout as needed to represent the pipe network connectivity. Boundary nodes represent the endpoints of the model and were placed at pipe outfalls at the edge of the model extents that discharge to the existing canals, rivers, or bays. In total there were 235 nodes in the North model and 342 nodes in the South model. Each node was assigned a unique name. ***Figure 3-3*** shows the North model existing conditions node diagram and ***Figure 3-4*** shows the South model existing conditions node diagram.

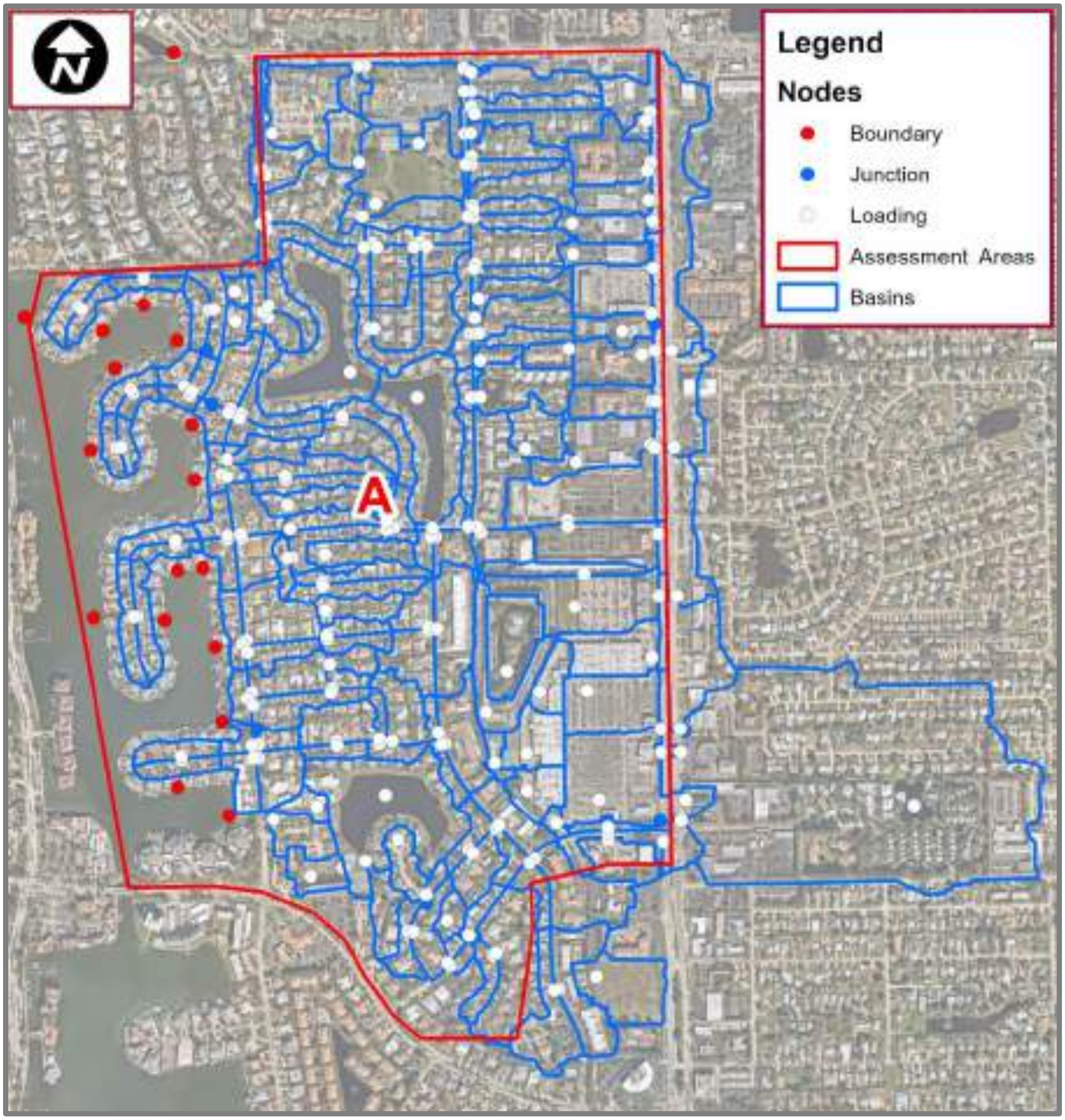

Figure 3-3 North Model Existing Condition Node Diagram

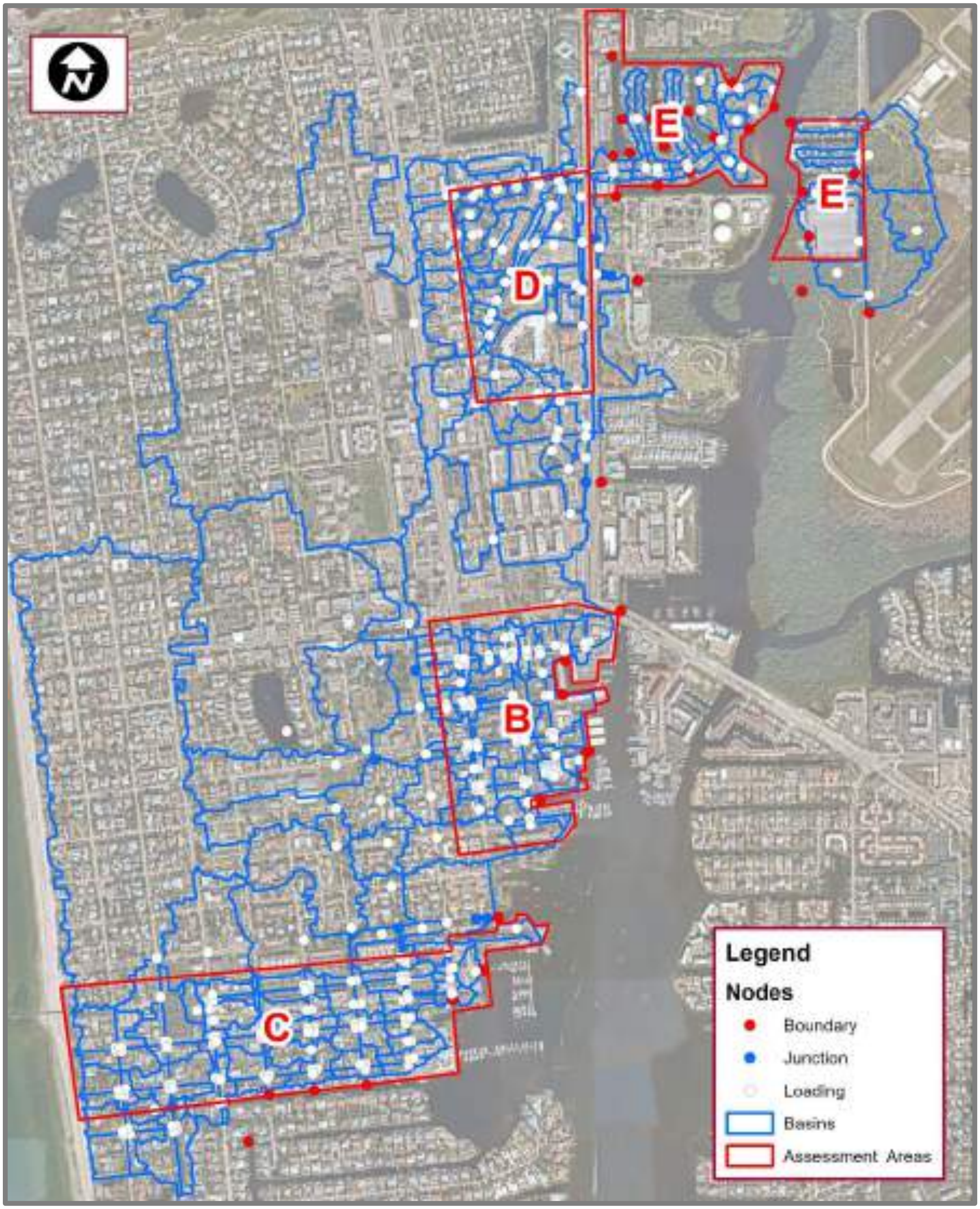

Figure 3-4 South Model Existing Condition Node Diagram

3.3.1.3. Links

Modeled links represent hydraulic connections between the storage areas, outfall locations, and junctions that are represented by nodes. The model consists of four different kinds of links: pipes, overland weirs, structural weirs, and drop structures.

Pipe links represent physical pipes within the study area that connect the nodes. Pipe links were placed and based on aerials, ERPs obtained from SFWMD, City infrastructure data, field reconnaissance, and survey of structures provided by the WGI. A total of 202 pipe links were modeled in the North model and 295 pipe links were modeled in the South model.

Overland weir links represent locations where water from one storage area overflows into another. Each overland flow weir is placed to connect a single node in a basin to a single node in an adjacent basin or to a boundary node. Each weir has an associated cross-section that represents the elevations along the basin boundary that the weir crosses. A total of 518 overland weir links were modeled in the North model and 719 overland weir links were modeled in the South model.

While overland weirs typically represent natural or manmade ridges along basin areas, structural weirs represent hydraulic structures that are specifically designed to accommodate stormwater flow at specific rates or elevations. There is only one structural weir in the model, which is located within Devils lake based on survey.

Drop structure links represent pipes that have an upstream structural weir component, which is typically a control structure box that is designed to restrict stormwater outflow. Drop structure links were placed similarly to pipe links. A total of 13 drop structure links were modeled in the North model and 14 drop structure links were modeled in the South model.

The full model schematics for the North and South model areas can be seen in ***Figure 3-5*** and ***Figure 3-6*** respectively below.

Figure 3-5 North Model Existing Conditions Schematic

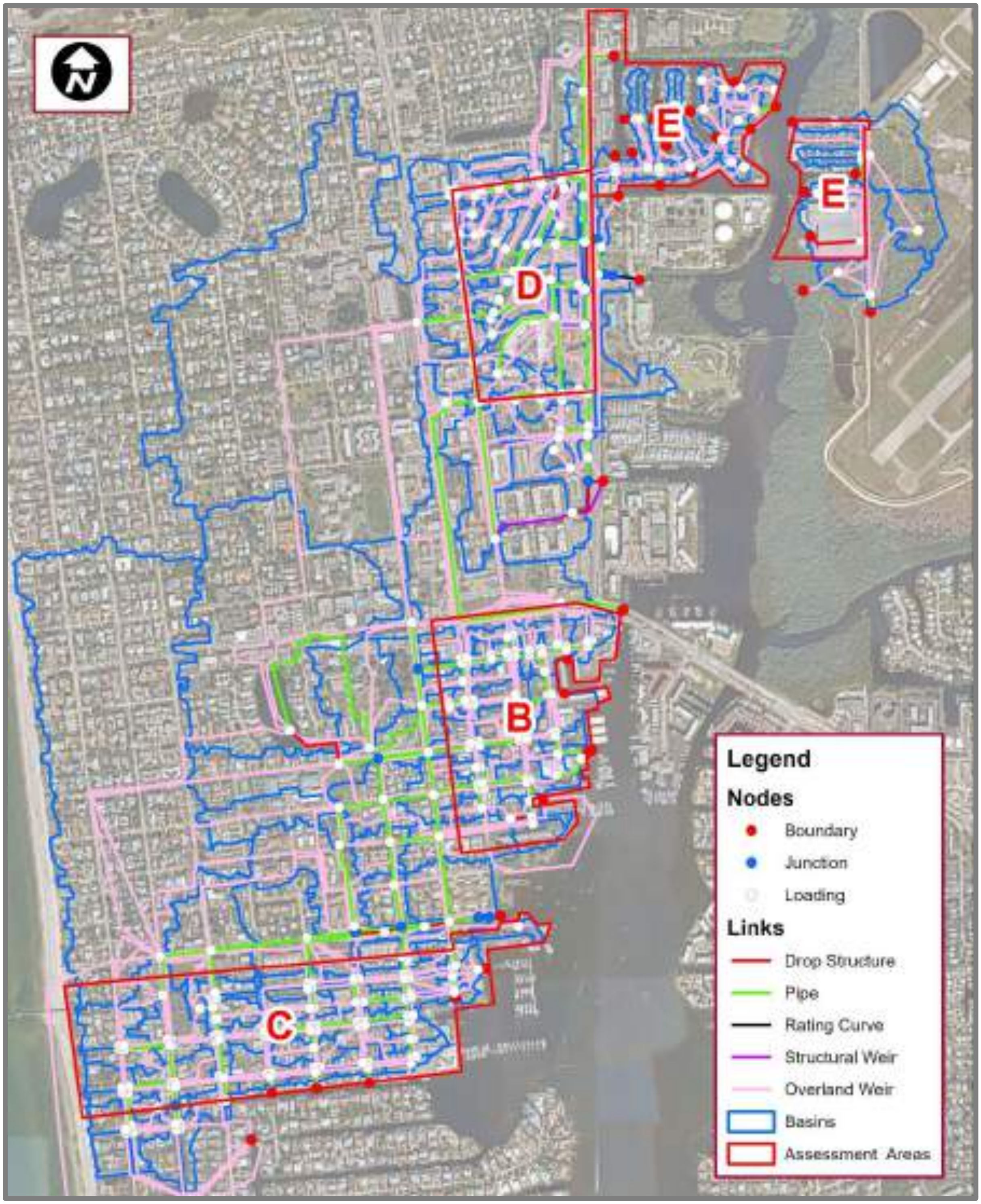

Figure 3-6 South Model Existing Condition Schematic

3.3.2. Model Naming Convention

Table 3-1 below overviews the naming convention of all model features.

Table 3-1 Model Naming Convention

Feature	Naming Convention - order of name reads from left to right (i.e. the first letter of a model feature is the leftmost, second letter is right of that, etc.)
Nodes	"N-" prefix used as first letter for all nodes Second letter (after "-") matches Assessment Area that node is located in Ex. N-ED is signifying a node in Assessment Area E
Boundary	Third letter matches the outfall location that corresponds with the node location (i.e., the first outfall location is the letter "A", the second outfall location is the letter "B", etc. Note that boundary nodes in Assessment Area A have an additional letter "B" included, signifying that they are located in Venetian Bay and not Devils Lake or Swan Lake Ex. N-ED corresponds to the fourth outfall node in Assessment Area E
Loading/Junction for Assessment Areas B, C, D, and E	The first three letters of each loading node corresponds to the boundary node downstream of the loading node based on pipe or drop structure link connections The fourth letter of the loading and junction nodes correspond to the order of pipe run (generally defined as a branch of pipe or drop structure links stemming from one point). The pipe run immediately connected to the boundary node was given the letter "A", while additional runs stemming off of the "A" run were given letters "B", "C", etc

	The numbers corresponding to end of the name correspond to how many pipe or drop structure links away from the corresponding boundary node that node is Ex. N-CF-A01 is part of pipe run A for boundary node N-CF and is 1 node away from node N-CF. N-CH-C06 is part of pipe run C for boundary node N-CH and is 6 nodes away from node N-CH Nodes at the end of an individual pipe that tied into a pipe run were given an “-x” or similar demarker at the end of the name Ex. N-CF-A03x represents a node upstream of an individual pipe that connects to Node N-CF-A02 and the associated pipe run
Loading/Junction for Assessment Area A	Note that all nodes within the Assessment Area A model have an additional letter between the letter corresponding with the Assessment Area (“A”) and the outfall location depending on if the outfall location was within Devils lake (denoted by “D”), Swan Lake (denoted by “S), or Venetian Bay (denoted by “B”). Ex. N-ABA-A02 discharges to boundary node N-ABA. Node N-ASA-A07 discharges to Swan Lake. Node N-ADS-A01 discharges to Devil’s Lake.
Basin	The basin name was the same as the name of the corresponding loading node, but with the letter “N” replaced with “B” Ex. B-ABD-A01 is routed to node N-ABD-A01. This basin is in Assessment Area A, is loaded to a node that outfalls to boundary node E in Venetian Bay , is along pipe run A, and loads to a node that is 1 away from N-ABD.

Links	Link names were generally based on the name of the upstream node. Further information on link names is included below based on the link type.
Pipes/Drop Structures	Pipe names were based on the upstream node name with the letter “N” replaced with the letter “P”. For multiple pipes leaving the same basin, letters “a”, “b”, etc. were added Ex. Pipe P-DP-H05 connects node H-DP-H05 to node N-DP-H04
Weirs	Weir names were based on the upstream node name with the letter “N” replaced with the letter “W”. An additional number was placed at the end of each weir, as almost all nodes contain multiple weirs leading from them Ex. Weirs W-ABD-A07-1 and W-ABD-A07-4 are both weirs with upstream node N-ABD-A07 and outfalling to two different downstream nodes.
Rating Curve	The Public Works pump is named P-DB-A01 (given the “P” demarker because the pipe component of the pump is modeled within the rating curve) and the Cove Pump Station is named R-CA-A01d (given the “R” demarker because the pipe component of the pump is modeled separately from the rating curve)
Weir Cross Sections	Weir Cross-Sections have the same name as the associated weir, but with the letter “W” replaced with the letter “X” Ex. Weir Cross Section X-DP-C03x-1 is associated with weir W-DP-C03x-1

Figure 3-7 provides an example of how node names were tied to the various outfall nodes within a given assessment area.

Figure 3-7 Nodes Names Related to Outfall Nodes

Figure 3-8 provides an example about how a group of nodes and pipes that discharge to the same outfall were classified into different runs and named accordingly.

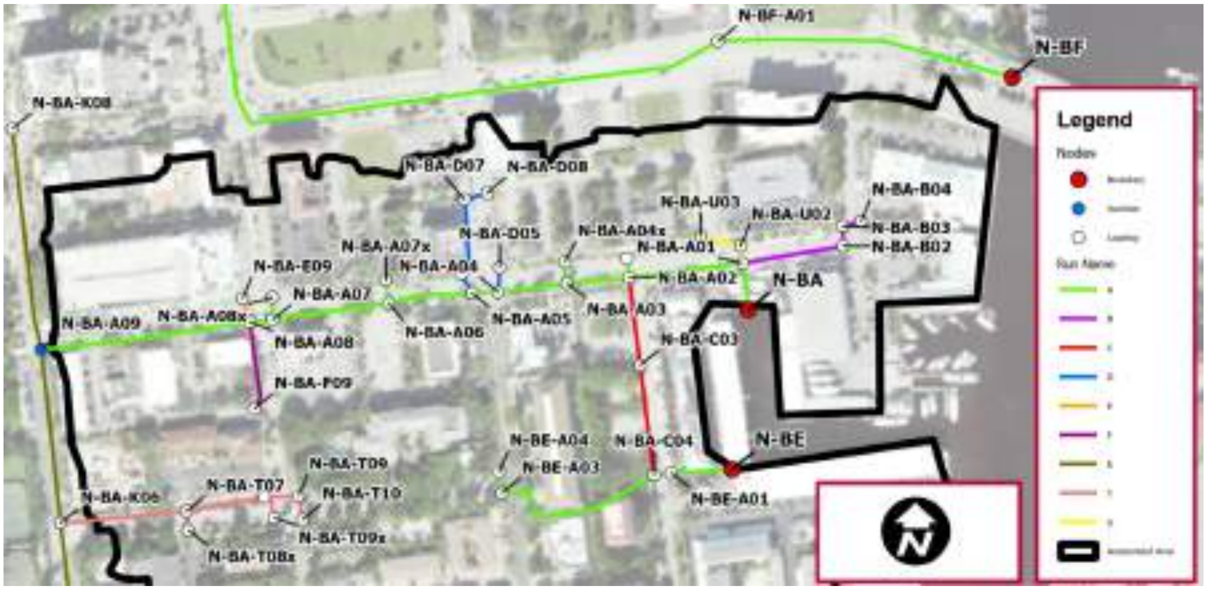

Figure 3-8 Node Names Related to Discharge Outfall

Figure 3-9 provides an example of how and nodes within a given run were named.

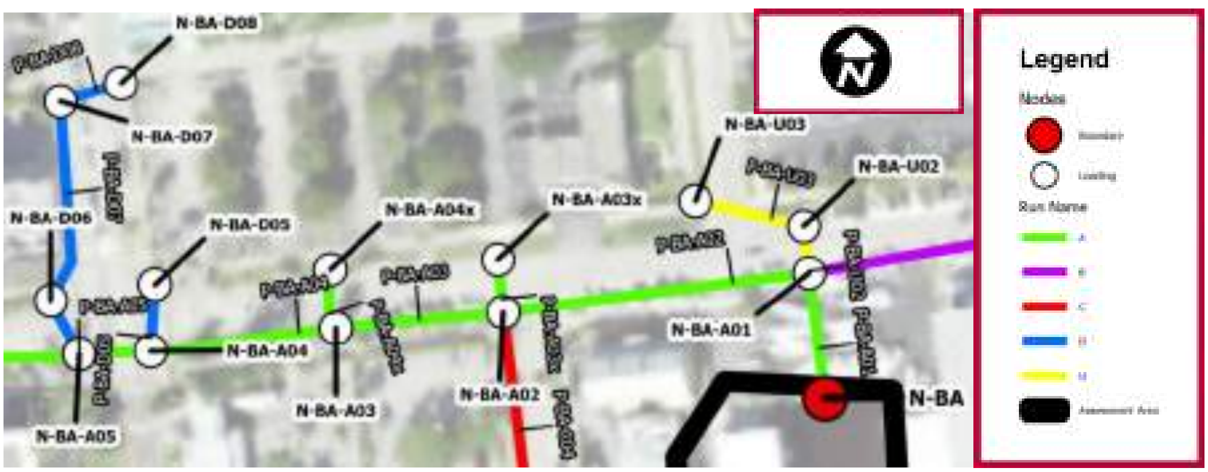

Figure 3-9 Node Names Related to Run

Note that there are some irregular instances of deviations to the naming convention throughout the models.

3.3.3.Modeled Storm Events

3.3.3.1. Rainfall Distribution

The selected design storm events for this analysis were the 25-year, 72-hour storm and the 10-year, 1-hour storm. Within ICPR, a rainfall distribution can be specified among a list of standard non-dimensional rainfall distributions. The rainfall distribution used for the 1-year, 1-hour storm was the FDOT-1. The rainfall distribution used for the 25-year, 72-hour storm was the SFWMD-72.

3.3.3.2. Rainfall Intensity

Rainfall intensity in inches is specified in ICPR and is applied along to the selected rainfall distribution during model execution. Rainfall values were based on the greater of NOAA 14-point precipitation frequency estimates and SFWMD values. The full methodology to determine rainfall values is described in the Model Recommendation Technical Memorandum found in ***Appendix C – Supporting Documentation***. Below, ***Table 3-2*** summarizes the modeled rainfall depth for each storm event:

Table 3-2 Modeled Rainfall Depths

Design Storm Event	Rainfall Depth (in)	Source
10-year, 1-hour	3.25	NOAA
25-year, 72-hour	11.8	SFWMD

3.3.4.Hydrologic Parameters

Each basin was assigned individual hydrologic parameters that determined the rate and volume of stormwater runoff generated by each basin. Each basin was assigned a specific node that calculated stormwater runoff would be routed to. Hydrologic parameters assigned to each basin included basin area, curve numbers, impervious and directly connected impervious percentages, time of concentrations, unit hydrograph method, and peaking factor.

Basin area is based on directly on the size of the delineated basins. The amount of runoff generated is based on the assigned curve number and impervious percentages of that basin. These values are based on the soil and landuse types within each basinCurve Number and Percent Impervious.

Time of concentration, which affects the rate of runoff generated by the basin based on a calculated travel time, was assigned based on each basin area.

The NRCS unit hydrograph method was used and an associated peaking factor, which represent the rate and time distribution of generated runoff, of 256 was assigned. This value was used for all basins in both models.

3.3.4.1. Curve Number and Percent Impervious

The SCS curve number method is a way that the amount of rainfall that is generated as excess runoff is calculated. Curve number values, which typically range from 30 to 98, were obtained from the TR-55 technical document. The higher the curve number, the more rainfall is generated by a basin. Based on review of the available soils data, a curve number of 80 was assigned to the entire project area due to the model area being predominately urban land, A/D soils, and B/D soils. The TR-55 assigns a curve number of 80 to A/D and B/D soils based on a “good” hydrologic condition, it is assumed that the urban land soil conditions mimic those of the A/D and B/D soils.

The manual basin input also includes an assumed percent impervious from an impervious set. The impervious set relates an assumed total impervious area and percent directly connected impervious area (DCIA) to each landuse type. DCIA refers to impervious area that is directly connected to the outfall location (such as a road that discharges through a pipe to an outfall) and will not have runoff that travels through a pervious area at some point. Assumed impervious and DCIA percentages were determined by a review of impervious areas within representative landuses within model area. The higher the impervious and DCIA percentages for a basin, the more runoff is generated. A representative Impervious and DCIA percentage was assigned to each landuse, as shown in ***Table 3-3.***

Table 3-3 Landuse Impervious and DCIA Characteristics

Landuse	Impervious (%)	DCIA (%)
Commercial and Services	95	95
Open Land	0	0
Reservoirs	100	100
Residential High Density	50	40
Residential Medium Density	65	45
Streams and Waterways	100	100
Transportation	95	90
Utilities	50	20
Wetland Hardwood Forests	100	100
Institutional (High)	80	60
Institutional (Low)	60	50
Recreational (Park, High)	50	40
Recreational (Park, Low)	20	10
Water	100	100
Wetland Hardwood Forests	100	100

3.3.4.2. Time of Concentration

Time of Concentration (TC) values for all basins were determined by calculating TC for representative basins that were selected based on variety of size. For each representative basin, a line was drawn from the loading location of the basin to the most hydraulically distant point, referred to as the longest flow path. Time of concentration was then calculated along the longest flow path for each representative basin using the TR55 method. Sheet flow was assumed to be the lesser of the first 100 ft or the longest flow path or the unpaved length of the longest flow path. From the calculated TCs, a representative TC was assigned to each basin based on size, shown in ***Table 3-4.***

Table 3-4 Time of Concentration Assigned to Basins by Basin Acreage

Rounded-Down Basin Area (acres)	Time of Concentration (mins)
0	10
1	12
2	15
3 to 7	25
Greater than 8	30

Due to the heavy urban landuse within the project area, a maximum TC of 30 was assigned. Basins were then reviewed to identify any instances where the TC was deemed too high based on the landuse within each basin. Specifically, we examined basins that were primarily high-impervious landuse classifications such as commercial, high density residential, and roads.

In such cases where the landuse was predominantly impervious, runoff in these areas would be routed to and through infrastructure more quickly than the assumed TCs – especially for basins 3 acres and larger. Therefore, we adjusted the TCs based on established impervious percentages. The adjusted TC values are found below in ***Table 3-5*.**

Table 3-5 Time of Concentration Landuse

Landuse	Time of Concentration (mins)
70-100% High Impervious	10
60-70% High Impervious	12
40-60% High Impervious	15

3.3.5.Node Parameters

There are two types of nodes in the model, stage-area node or time-stage node. Stage-area nodes have a certain area at a given stage (elevation), which is represented by a stage-area table. Time-stage nodes have a defined stage at a given time, which is represented by a time-stage table. All nodes have an initial stage, which represents the water elevation at that node at the start of the model. During the model run, the stages of stage-area nodes rise based on the calculations performed within the model based on other parameters, while the stages of time-stage nodes rise based on user input for those nodes.

3.3.5.1. Stage-Area Nodes

Loading and junction nodes were modeled as stage/area nodes. For loading nodes, storage was assigned by using ICPR4 to extract the storge area at each elevation within the node at an interval of 0.1 ft from the DEM. This generated a stage/area table associated with each node. The area used to define the stage-area table for these nodes was the area of the contributing basin.

Junction nodes have limited to no storage associated with them, and therefore have assumed areas of 0.001 acres at each elevation. If pipes linked to a stage-area node had an invert lower than the minimum storage area determined by the DEM, the invert elevation was added to the storage elevation at an assumed area of 0.001 acres.

3.3.5.2. Time-Stage Nodes

Boundary nodes were modeled as time/stage nodes, which have an assigned elevation at specific model simulation times. his value was set to a constant tailwater condition throughout the duration of the modeled storm events.

Tailwater conditions were set based on tidal data from a NOAA Station 8725110 Naples. Data was downloaded from January 1, 1980 to October 31, 2021. Based on data analysis and discussion with the City, the existing tailwater was set at 1.59 feet as this was found to be the 90th percentile high tide elevation between November 1, 2016 and October 31, 2021, as outlined in the Model Recommendation Memorandum. This tailwater condition was reflected in the model by assigning the initial stage and the stage throughout the model simulation to 1.59 feet. The full methodology for determining the tailwater condition can be found in the Model Recommendation Technical Memorandum in ***Appendix C – Supporting Documentation.***

3.3.6.Node Initial Conditions Parameters

The initial stage of each node represents the starting water level of that node at the beginning of the simulation. Initial stage parameters for nodes were set based on a determination of static wet or dry conditions at each location. A wet condition refers to areas with standing water (such as a lake) or structures that directly connect to a water body and where the structure is lower than the downstream water body's elevation. A dry condition refers to all other areas.

Nodes in dry condition areas were set based on the minimum elevation from the corresponding DEM stage-area relationship.

For nodes representing waterbodies, a wet condition was used, and the initial stage was set to the estimated control elevation of the water body. Control elevations were estimated from a combination of survey data and a review of the DEM versus the extents of the waterbody while accounting for physical outfall parameters including drop structure weir or pipe elevations.

For both wet and dry condition nodes, downstream links were then reviewed to set the model to static conditions at the start of the modeled storm event. In cases where the downstream link has lower inverts, the initial stages were set to match the invert unless fully submerged. If fully submerged, the initial stage was set to match the downstream initial stage to ensure static conditions at the beginning of the storm simulation. Nodes connected by pipes to the pump stations were assumed to operate under dry conditions, as it is assumed that water from the downstream waterbody will not backflow into pumps. Initial stages were set to the pump off elevation.

For the North model, initial stages for Devils Lake and Swan Lake were set differently for each storm scenario because they both have control structures that are controlled differently depending on anticipated storm size. The City provided input on control structure operation protocols. ***Table 3-6*** below outlines the assumed operating status for the control structures for Devils Lake and Swan Lake. Note that when all boards are taken out, the lakes are equalized with the downstream time-stage node.

Table 3-6 Control Structure Operating Status

Control Structure Location	10-year Operating Status	25-year Operating Status
Devils Lake	Top boards taken out, initial stage is at controlling board elevation of 1.93	All boards taken out, initial stage is set to tailwater elevation of 1.59
Swan Lake	All boards left in, initial stage is set at controlling board elevation of 2.49	All boards taken out, initial stage is set to tailwater elevation of 1.59

3.3.7.Hydraulic Link Parameters

The links within the study area boundary represent pipes, overland weirs, structural weirs, drop structures, and rating curves. The links were placed and parameterized based on aerials, DEM, ERPs, field reconnaissance, survey of structures provided by WGI, and City infrastructure data.

3.3.7.1. Pipes

Each pipe was assigned parameters that determine the modeled hydraulic performance of that link. Physical pipe characteristics, such as the pipe depth, invert elevation, length, and pipe geometry type (shape) were assigned based on available data. Manning's roughness coefficients for the pipes were assigned based on the pipe material referencing Manning's n Values (Chow 1959) and the ICPR4 technical manual.

A culvert code was assigned to each pipe to calculate inlet control losses based on the inlet configuration, which was assumed to be a square edge with a headwall for all pipes. Entrance loss coefficients were obtained from the ICPR4 Technical Manual and Report No. FHWA-HIF-12-026, Hydraulic Design Series No. 5, Table C-2 (FHWA 2012). An exit loss coefficient of 0 was used for any pipe discharging to another pipe link, while an exit loss of 1 was assigned for any pipe discharging to a non-pipe outfall.

3.3.7.2. Weirs

Most of the weirs included and modeled represent overland flow between basins. Basin boundaries were used to create overland weir cross-sections. Station and elevation data was then assigned from the DEM along the cross-sections. Each overland weir was assigned an invert that was equal to the lowest assigned elevation along the cross-section. Weir coefficients were set to a minimum of 2.8 for grass areas and up to a maximum of 3.2 for paved areas.

One structural weir was modeled. This structure is in Devils Lake and is modeled as a rectangular weir with an invert, depth, and width based on survey. Discharge coefficients for the structural weir were left as the ICPR4 defaults of 3.2 for the weir discharge coefficient and 0.6 for the orifice discharge coefficient.

3.3.7.3. Drop Structures

Drop structures represent a pipe and weir combination structure within ICPR4. Data inputs for drop structures were based on available data. The pipe components of the drop structures were parameterized using the same methodology as the pipe links. The weir components of the drop structures include the geometry, depth, width, and elevations of the various slots and grates of the structures. All discharge coefficients for the weir components were left as the ICPR4 defaults of 3.2 for the weir discharge coefficient and 0.6 for the orifice discharge coefficient.

In existing conditions for Assessment Area A, Devils Lake and Swan Lake discharge via operable control structures. These control structures have boards that are removed ahead of certain storm events based on an operating procedure provided by the City as described in ***Section 3.3.6 Node Initial Conditions Parameters***. These different operating procedures were reflected in the model by varying the weir inverts and dimensions of the drop structures, which reflect boards being removed or remaining, depending on the storm intensity. The weir components in scenarios where boards are removed are altered to have lower inverts and greater weir depths, which are reflective of an increased weir opening.

3.3.7.4. Rating Curves

A total of two rating curves were modeled in the study area. Rating curves represent the Cove and Public Works pump stations. ***Table 3-7*** shows the Head-Discharge table that was established based on City provided data and used for both rating curves.

Table 3-7 Head-Discharge Table for Rating Curves

Head	Discharge (cfs)
31	36.8
30	40.1
29.5	43.4
27	46.8
25	50.1
23	53.5
20	56.8
18	60.2
15	63.5
12	66.8

Table 3-8 shows the on/off elevations used for each pump station. Pump operating elevations were based on the lowest elevations of the Pump Station Operating Schedules established by the City in October 1985. Elevations were provided in NGVD29 and were converted to NAVD88.

Table 3-8 Pump Station Operating Schedules

Pump Station	On Elevation (ft)	Off Elevation (ft)
Cove Station	-3.37	-6.87
Public Works Station	-7.17	-10.67

3.4. Existing Condition Model Validation and Quality Control

The 2017 storm event Invest 92L was selected as the model validation event for the existing conditions model. Next Generation Weather Radar (NEXRAD) spatial data were obtained from SFWMD that contains location-specific rainfall data within the study area and surrounding vicinity for 08/23/2017-08/30/2017. For the validation event, each basin was assigned a rainfall amount based on the NEXRAD spatial data from Invest 92-L. Results from the validation storm were compared with historic flooding locations provided by the City. Comparison showed that the model produced reasonable results in most areas based on available flooding photos. In areas where actual flooding appeared to be higher than was simulated in the model, it is believed that maintenance issues could have caused blockages in the stormwater system.

3.5. Model Results

Once the model was validated, the 10yr-1hr and 25yr-72hr storm events were simulated. The resulting node maximum stages, which represent how high water rises in the model, were reviewed. The node maximum stage results were used to create graphic floodplains to represent the inundation throughout the modeled area. These floodplains were generated for the 10yr-1hr and 25yr-72hr storm. These model result tables can be found in ***Appendix B – Model Results*** and schematic model results can be found in ***Existing Conditions Exhibits Section***.

3.5.1. Summary of Model Results

A summary of simulated flooding locations is included below for each assessment area.

3.5.1.1. Assessment Area A

In Assessment Area A, modeled flooding is present along Crayton Road and the connected residential streets including Pirates Blight, Devils Blight, Neapolitan Way, and Turtle Hatch Road. Modeled flooding is also present along West Boulevard and other areas that drain to either Devils Lake or Swan Lake. Flooding is occurring where modeled runoff exceeds the existing infrastructure capacity. These modeled flooding extents are shown below in ***Figure 3-10***.

Figure 3-10 Assessment Area A Existing Modeled Inundation (25-yr, 72-hr Storm)

3.5.1.2. Assessment Area B

In Assessment Area B, modeled flooding is present throughout the assessment area in existing conditions. Based on the existing conditions modeling, the Cove Pump Station's capacity is exceeded, as the area upstream of the pump station shows a significant amount of flooding in the existing model. The flooding within the Assessment Area and the flooding upstream of the Cove Pump Station are connected via overland flow. There are also some existing outfalls from the Assessment Area that drain east to Naples Bay, but these outfalls are generally small (12 to 18-inches), which results in modeled flooding. Additionally, the model indicates that 5th Avenue S flows into the Assessment Area (at 6th Avenue S) via overland flow along 9th St S and 10th St S, which contributes to existing modeled flooding within the Assessment Area. These modeled flooding extents are shown below in ***Figure 3-11***.

Figure 3-11 Assessment Area B Existing Modeled Inundation (25-yr, 72-hr Storm)

3.5.1.3. Assessment Area C

In Assessment Area C, the large amount of existing modeled flooding associated with the eastern part of the area is due to modeled runoff from the assessment area and offsite areas exceeding the capacity of the existing pipe infrastructure and the Cove Pump Station. The flooding associated with the western portion of the Assessment Area is due to modeled runoff exceeding pipe infrastructure and the low elevations of the existing roadway. As with Assessment Area B, there is a significant amount of overland flow from the location of the Cove Pump Station into the eastern part of the Assessment Area that contributes to modeled flooding. These modeled flooding extents are shown below in ***Figure 3-12***.

Figure 3-12 Assessment Area C Existing Modeled Inundation (25-yr, 72-hr Storm)

3.5.1.4. Assessment Area D

Existing condition model results indicate that the runoff from the assessment area and the inflow from the 160-acre basin on the west side of 9th St N are greater than the capacity of existing pipe and pump infrastructure within the assessment area. As a result, widespread modeled flooding occurs along Central Ave, 5th Ave N, Goodlette-Frank Rd, and 10th St N, as well as throughout the center of the assessment area. These modeled flooding extents are shown below in ***Figure 3-13***.

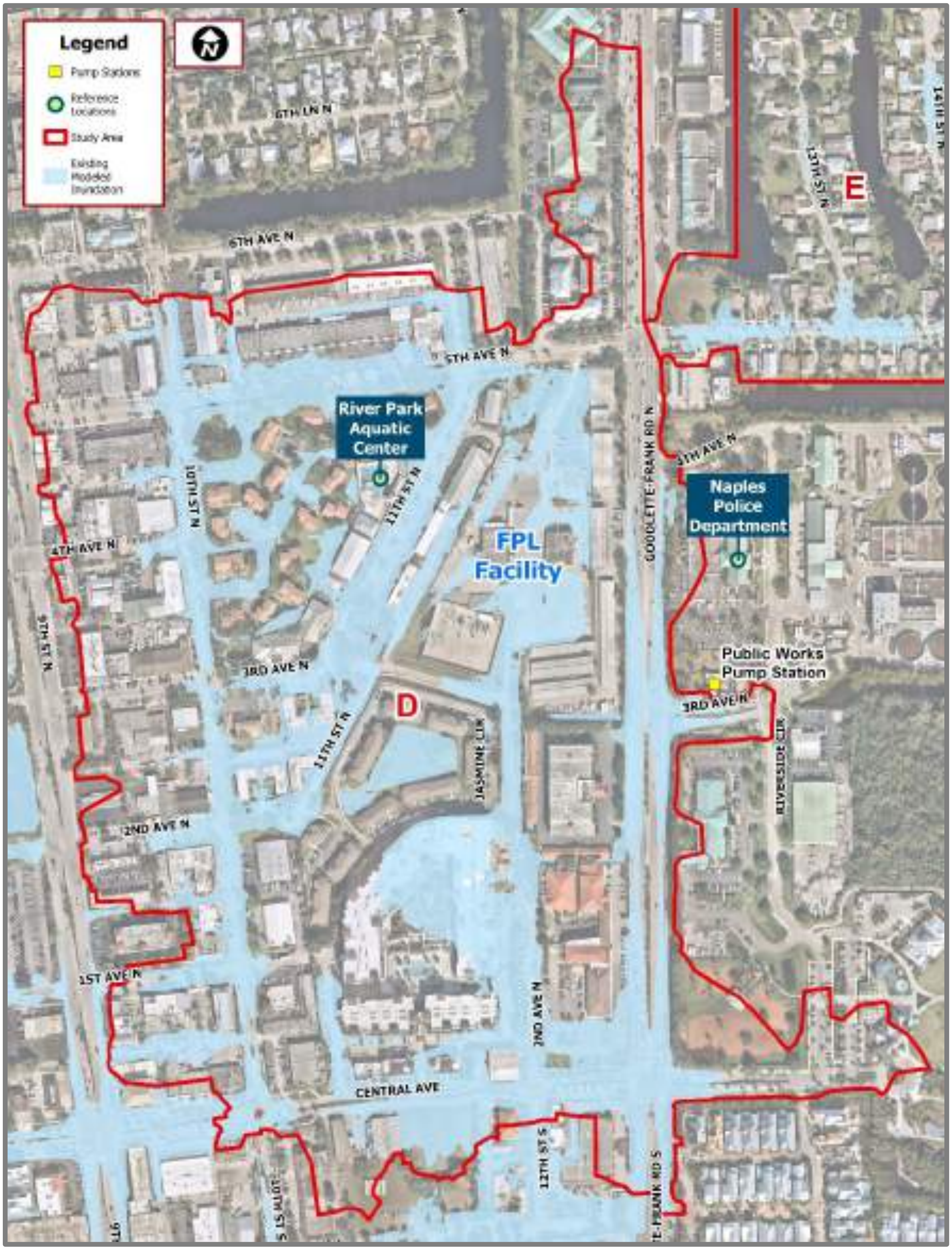

Figure 3-13 Assessment Area D Existing Modeled Inundation (25-yr, 72-hr Storm)

3.5.1.5. Assessment Area E

For Assessment Area E, the model shows flooding along 5th Ave N and the nearby 15th St N and 14th St N is undersized. Additional flooding is demonstrated within residential areas near North Rd, specifically along Airway Drive. When compared to other Assessment Areas, the modeled flooding within Assessment Area E is lesser, but model results still indicate that modeled runoff is greater than the capacity of infrastructure. These modeled flooding extents are shown below in ***Figure 3-14***.

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Figure 3-14 Assessment Area E Existing Modeled Inundation (25-yr, 72-hr Storm)

4. Alternatives Analysis

4.1. Level of Service Goals

A target LOS standard was set for this project: no flooding occurs at the crown of the road during the modeled 10-year, 1-hour and 25-year, 72-hour storm events. This goal was used for both the existing and future alternatives analyses, with the understanding that this goal may not be achievable. See ***Appendix C – Supporting Documentation*** for more details. In the existing conditions, this LOS goal is not met throughout the Assessment Areas. All sensitivity and alternatives analyses that were performed were evaluated based on the ability to achieve LOS goals in areas that did not meet them in existing conditions.

4.2. Sensitivity Analysis

4.2.1. Methodology

Prior to proposing specific alternatives, a Sensitivity Analysis was performed to assess how broad changes affected model results in existing conditions. The existing conditions models were updated based on potential improvements in each Assessment Areas. Improvements included upsizing pipes, upsizing pumps, adding seawalls, raising roads, adding check valves to pipes, adding new pipes, and disconnecting existing pipes from pump stations. The full list of improvements tested are included in the Sensitivity Analysis Memo found in ***Appendix C – Supporting Documentation***.

4.2.2. Conclusions

Table 4-1 summarizes the results and conclusions drawn from the sensitivity analysis.

Table 4-1 Sensitivity Analysis Results

Model Iteration	Sensitivity Analysis Findings
Upsizing Pipe Systems	• A review of the gravity fed systems without pumps shows benefit in all scenarios. However, in systems with pumps, there was close to no change in results. Therefore, in a gravity-fed system, upsizing pipes is more effective than in systems served by a pump. • There are areas to justify upsizing certain pipes instead of upsizing all pipes due to specific pipes being restrictive in a given pipe system. • In some areas it was ineffective to solely upsize pipes within the Assessment Area as overland flow from offsite areas keeps flood stages high. • Overall, it was ineffective to upsize pipes in areas served by pumps without also upsizing pumps.
Modifying/ Adding Pump Stations	• Adding rating curve links (pumps) at small flows (less than 10 cfs) provides localized reductions in flooding at smaller outfalls, but did not provide modeled flood reduction at major outfalls. • When adding pumps upstream of lakes, the improvements are localized to pump locations due to upstream pipes restricting flow to the pump station. • When adding pumps downstream of lakes the downstream infrastructure limits flood reduction. When connecting infrastructure to an existing pump, the downstream infrastructure needs to be upsized to handle additional flow. • Diverting existing pipe connections to new pump station reduces stages, as it reduces the incoming flow to existing pump station.
Combination Runs	• Supports the same conclusions as above.
Other Resilience Solutions	• In existing conditions, adding seawalls without also upsizing or adding other stormwater infrastructure increases flooding because it restricts overland flow out of the Assessment Areas. Seawalls may result in a different result in a future condition (i.e. with sea level rise). • Raising roads decreases flood depths on roads but increases flooding outside the right-of-way because roadway storage has been reduced. This solution would need to be included in combination with another solution such as pump stations or increased pipe sizes. • Adding check valves in areas that did not already have them had no effect on the system. This may result in a different result in a future condition (i.e. with sea level rise). • Additional storage (amount was limited due to feasibility) resulted in local flood reduction but does not reduce flooding through the whole system.

4.3. Preliminary Alternatives

Based on the sensitivity analysis and the desired level of service, three alternative models were created for each Assessment Area. The results of the sensitivity analysis suggested that broad changes to the model had varying effectiveness depending on the location. As a result, the preliminary alternatives stemmed from a combination of proposed improvements from the sensitivity analysis. Alternatives included upsizing existing pipes, upsizing existing pumps, adding new pipes, adding new pumps, removing existing connections, or some combination of these.

To complete this analysis, the existing conditions model was updated with proposed improvements. Proposed pipe improvements were incorporated into the new model by adding pipe links to the model, turning pipe flow to “None” in the model to demonstrate the removal of existing connections, and changing the pipe link diameter and invert elevation parameters to reflect the upsizing of existing pipes. Proposed pump improvements were incorporated into the model by adding new rating curve links that were modeled at a proposed flow rate and changing the rating curves associated with existing pumps to have an increased flow rate.

Table 4-2 summarizes the three initial alternatives for each Assessment Area. These are named by the alternative number and corresponding Assessment Area – 2D for example was the second alternative for Assessment Area D.

Table 4-2 Assessment Area Initial Alternatives

Alternative ID	Name	Description
1A	Upsize and Add Pipes	Upsize pipes throughout Assessment Area. Add new pipe connections to increase discharge from roadways to lakes and Venetian Bay. No pumps were included in this alternative.
2A	Master Pump Station	Upsize pipes throughout Assessment Area. Add stormwater pump station discharging to Venetian Bay. Add new pipe connections to divert water from lakes to proposed pump station.
3A	Lakes Pump Stations	Upsize pipes throughout Assessment Area. Add new pipe connections to increase discharge from roadways to lakes and Venetian Bay. Add pump at each lake to increase outflow from lake to Venetian Bay.
1B	Upsize Pipes Only	No new pumps or infrastructure connections are proposed, improvements are limited to upsizing existing pipes.
2B	Naples Bay Pump Stations	Add three pump stations discharging to Naples Bay. Upsize pipes throughout Assessment Area. Eliminate pipe connections from Assessment Area to Cove Pump Station and add pipe connections to proposed pump stations. Upsize Cove Pump Station..
3B	Pipes upsized with new connections	Upsized pipes throughout Assessment Area. Eliminate pipe connections from Assessment Area to Cove Pump Station and add new gravity outfalls to Naples Bay. Upsize Cove Pump Station.

Alternative ID	Name	Description
1C	Upsize Pipes and Pump Only	No new pumps or infrastructure connections are proposed, improvements are limited to upsizing existing pipes and upsizing Cove Pump Station.
2C	Master Pump Stations	Add two pump stations that will serve the majority of the Assessment Area. Upsize pipes throughout the Assessment Area. Eliminate pipe connections from Assessment Area to Cove Pump Station and add pipe connections to proposed pump station. Add pipe connections to pump station throughout the Assessment Area.
3C	Pump Stations and Gravity Outfalls	Add two pump stations that will serve about half of the Assessment Area. Add gravity outfalls and upsize existing gravity outfalls. Upsize pipes throughout the Assessment Area. Eliminate pipe connections from Assessment Area to Cove Pump Station and add pipe connections to proposed pump station. Add pipe connections to nearest improved outfall throughout the Assessment Area.
1D	Upsize Pipes and Pump Only	No new pumps or infrastructure connections are proposed, improvements are limited to upsizing existing pipes and upsizing Public Works Pump.
2D	Upsize Pipes and add Pump	Add master pump station at Goodlette-Frank Rd. Upsize gravity outfalls along 5th Avenue. Add connections to new pump and upsized gravity outfall. Disconnect 5th Ave N from Public Works Pump. Upsize Public Works Pump. Upsize pipes throughout Assessment Area.
3D	Fully Disconnect from Public Works Pump	Disconnect almost all stormwater infrastructure within the roads from Public Works Pump. Add pipe connections to new and upsized gravity outfalls along 5th Avenue and Goodlette-Frank Rd. Upsize pipes throughout Assessment Area.
1E	Upsize Pipes Only	No new pumps or infrastructure connections are proposed, improvements are limited to upsizing existing pipes.
2E	Add Pump Station with Connection	Add pump station at park. Connect all stormwater infrastructure to pump station. Upsize pipes throughout the Assessment Area.
3E	Connect to Assessment Area E	Add pipe connection for all existing inlet into Area E. Upsize pipes throughout the Assessment Area.

4.4. Improvement Alternatives

Based on the effectiveness of the three initial alternatives, two were chosen to move forward for model refinement. A summary of these are included in ***Table 4-3***. The Improvement Alternatives, aimed to maximize the reduction in modeled flood staging while minimizing the required infrastructure improvement.

Table 4-3 Improvement Alternatives IDs and Names

Alternative ID	Name
A1	Upsize and Add Pipes
A2	Master Pump Station
B2	Upsized Trunklines and Added Pump
B3	Upsized Trunklines
C2	Upsize and add Pipes
C3	Upsized Trunklines and Added Pumps
D2	Upsize Pipes and add Pump
D3	Fully Disconnect from Public Works Pump
E1	Upsize Pipes Only
E2	Add Pump Station with Connection

Schematics of each Improvement Alternative are included in ***Improvement Alternatives Exhibit Section.***

4.5. Combined Models

During the analysis, it was determined it was ineffective to continue to analyze areas B, C, and D independently, as they are interconnected through either infrastructure or overland flow. It was found that model improvements in one of the southern Assessment Areas would influence other areas. Accordingly, it was decided that these three areas should be analyzed together in one model. This resulted in the “South” model. This also allowed for proposed improvements of pipe connections that connected the Assessment Areas. ***Figure 4-1*** below shows which offsite trunklines were focused on for improvements.

The models for alternative 2B, 2C, and 2D were combined into model 2BCD. These models were grouped to be combined as they all incorporated pump improvements. Similarly, the models for Improvement Alternatives 3B, 3C, and 3D, which focus on maximizing gravity outflow where possible, were combined into model 3BCD. The proposed trunkline improvements were incorporated into each of the combined BCD models.

Figure 4-1 Offsite Trunkline Focus Areas for the Combined South Model

4.6. Improvement Alternative Model Results

Model results for both of the Improvement Alternatives are provided in ***Appendix B – Model Results***. See below for summary of general findings of the Improvement Alternatives Analysis. Schematics for all assessment areas are included in ***Improvement Alternatives Exhibit Section.***

4.6.1.Assessment Area A

In Alternative 1A and 2A, reducing modeled flood elevations was achieved by upsizing existing pipes and adding new pipe connections. The modeled effectiveness of infrastructure changes varied throughout the Assessment Area. Typically, upsized structures that discharge to the Venetian Bay were more effective than upsized structures discharging to a lake. For areas draining to the lakes, upsized infrastructure at elevations higher than lake maximum stages showed significantly more flooding improvement than upsized infrastructure at lower elevations. Changes to lake control structure operating elevations or dimensions were not evaluated due to quality and operating concerns. As a result, modeled lake maximum stage elevations are slightly higher in the Improvement Alternatives due to additional inflow. These increased stages do not represent a significant created flood hazard. The areas that saw the greatest modeled flood improvement with the upsized infrastructure were West Boulevard, Crayton Road, and the western connected roads.

The modeled flood improvements for Alternative 2A was slightly better than Alternative 1A along Crayton Rd due to the connection to a modeled pump station.

4.6.2.Assessment Area B

In Alternative 2B and 3B, diverting water from the Cove Pump to improved infrastructure within the Assessment Area that outfalls east to Naples Bay maximized modeled flood reduction. The Improvement Alternatives analysis for this Assessment Area also incorporated changes to the area west of the study area along 11th Ave S, 6th St South, and 9th Ave S. The model saw a significant reduction in flood elevations by diverting flow from the Cove Pump Station and upsizing the Cove Pump Station. This is because less water could overland flow from the Cove Pump Station area to the Assessment Area in the model.

Due to the small size of existing outfalls from the Assessment Area to the Naples Bay, meaningful modeled flood reduction was only achieved when the structural outfalls from the Assessment Area into the Naples Bay were significantly increased. Alternative 2B, with pump stations modeled as proposed outfalls was more effective than the gravity outfalls proposed in Alternative 3B due to the large amount of flow from offsite areas, unless proposed gravity outfalls are significant, such as in the north side of the Assessment Area in Improvement Alternative 3B. Pump stations were required to be sized to handle additional overland inflow from offsite areas to see significant flooding benefit.

The Improvement Alternatives analysis for this Assessment Area also incorporated changes to the area west of the study area along 11th Ave S, 6th St South, and 9th Ave S. The goal of this change was to further reduce inflow to Cove Pump Station by diverting flow from 11th Ave and 8th St South to a proposed Pump Station (Pump C3). The upsizing of secondary drainage (defined as pipes that tie into a larger trunkline) reduced modeled flooding, especially at local level including intersections and street corners. However, adding upsized trunklines, new major pipe connections, and proposed pump stations was more effective at reducing modeled flooding than solely upsizing secondary storm infrastructure.

4.6.3. Assessment Area C

In Alternative 2C, upsizing the Cove Pump Station reduces overland flow from that area to the Assessment Area. Additionally, diverting stormwater that went to the Cove Pump Station from the Assessment Area to a proposed pump station limits this modeled overland flow. Additionally, Alternative 2C, which used stormwater pump stations was more effective than Alterative 3C, which used upsized gravity outfalls for the drainage areas.

For the eastern drainage area, this was modeled as a new pump station, Pump C2, which pumps stormwater inflow that discharged to the Cove Pump Station in the existing conditions model. For the western drainage area, the modeled stormwater pump, Pump C1, was effective in reducing flooding due to the low elevations of the roads in this area, which did not effectively drain using a gravity system.

Infrastructure connecting to the proposed pump stations was required to be upsized to reduce localized flooding. The portions of the Assessment Area that utilized gravity flow in Improvement Alternative 3C did not experience the same level of modeled flood reduction as these areas in Improvement Alternative 2C when they were routed to a pump station.

4.6.4. Assessment Area D

For Alternatives 2D and 3D, modeled flooding improvement was shown along Central Ave and 5th Ave N by increasing discharge from these areas to the Gordon River. Due to a large amount of inflow from 9th St N, the needed infrastructure in these areas is large with multiple outfalls needed to adequately reduce flooding. Additional gravity outfall showed similar improvement to a proposed stormwater pump station.

Modeled flooding improvement was shown in the center of the Assessment Area even without upsizing FPL infrastructure. This was achieved by eliminating connections to the FPL system. The pump outflow proposed in Improvement Alternative 2D did not provide a significantly higher flood benefit than the gravity outfall proposed in Improvement Alternative 3D.

In Improvement Alternative 2D, the connection from Central Ave to 10th St N was not proposed to be eliminated. This provides additional modeled flood benefit at 10th St N and lesser modeled flood benefit at Central Ave when compared to Alternative 3D, where this connection is eliminated.

4.6.5. Assessment Area E

In Alternative 1E, modeled flooding improvement was shown by upsizing existing infrastructure discharging directly to the canal. This was able to be achieved without adding new infrastructure connections.

The additional pipe connections and pump stations proposed in Alternative 2E did not provide a greater modeled floodplain benefit than just upsizing pipes as was proposed in Improvement Alternative 1E.

In addition to Alternatives 1E and 2E, model alternatives assessing a potential connection to Area D was assessed, but this connection did not provide enough additional modeled benefit to overcome the phasing and infrastructure obstacles that would be associated with that change. Additionally, it proved ineffective in some model runs.

5. Future Conditions Analysis

5.1. Introduction

The Future Conditions Analysis evaluates the effect of rising sea level on the City's existing stormwater infrastructure, as well as for the proposed Improvement Alternatives. These two conditions are described in ***Sections 5.2 Baseline Future Conditions Model*** and ***5.3 Proposed Improvement Alternatives in Future Conditions*** below. Based on the results of these two scenarios, additional improvements were then proposed to try to reach the desired level of service in the future conditions model ***Section 5.4 Long-Range Resilient Alternatives*** While it was not always feasible to do this, that was the aim of this alternatives analysis. These alternatives are referred to as the Long-Range Resilient Alternatives. Once this was completed, the Long-Range Resilient Alternatives were then modeled in existing conditions, as discussed in ***Section 5.5 Long-Range Resilient Alternatives with Existing Tailwater***.

5.2. Baseline Future Conditions Model

The first step in the Future Conditions Analysis was to update the existing conditions models to reflect future conditions. This included modifications to the modeled boundary conditions. The boundary conditions also resulted in modifications to the modeled initial stages. All changes that were considered for the future condition model as well as the chosen changes are documented in the Model Recommendations Technical Memorandum in ***Appendix C – Supporting Documentation.***

As described in the Model Recommendation Technical Memorandum, it was assumed that projects proposed to be implemented in this study should be able to withstand sea level rise. With this in mind, a planning horizon of 70 years was considered. This was determined by assuming an underground stormwater infrastructure useful life of 50 years and that it may take 20 years to implement the projects proposed in this study. Sea level was estimated from the USACE Sea Level Change Curve Calculator. These two items combined resulted in an estimated sea level rise of 2.65 feet in 2090. This added to the existing tailwater condition, results in an updated proposed tailwater of 4.4 feet.

The estimated future sea level was modeled by changing the static tailwater conditions of all of the boundary nodes from 1.59 feet to 4.4 feet. This change was reflected in the model by raising the stages of the time-stage nodes associated with the outfall bays, rivers, and canals, which serve as the boundary conditions of our model.

Note that several of the loading nodes, including almost all the nodes within the south model, are hydraulically connected to the boundary nodes and exist in static conditions at an elevation below 4.4 feet. As a result, the initial stages of these nodes were raised to 4.4 feet to prevent unrealistic backflows at the start of the model. Due to the increase in boundary and initial stages, the model showed significantly more flooding in the Baseline Future Conditions Model than in the Existing Conditions Model. Results for Baseline Future Conditions Models are in ***Appendix B – Model Results.***

5.3. Proposed Improvement Alternatives in Future Conditions

The Improvement Alternatives that were chosen considering existing conditions were then modeled under future conditions. The Improvement Alternative models were updated with the future conditions tailwater of 4.4 feet (referred to as the Improvement Alternatives with Future Conditions Tailwater models). This resulted in changes to both tailwater conditions and initial stages in the model.

The observed flooding in the Improvement Alternatives with Future Conditions Tailwater models is similar to the flooding observed in the Baseline Future Conditions Model. This is due to hydraulic connections from the assessment area at elevations lower than the future conditions tailwater, which is not addressed in the Improvement Alternatives. The exception to this was the eastern side of Assessment Area A, where existing ground elevations were higher than the tailwater conditions. However, for the western side of Assessment Area A and for all other Assessment Areas, the findings of the Improvement Alternatives with Future Conditions Tailwater models largely indicated that the Improvement Alternatives would not sufficiently reduce simulated flooding in future conditions without additional improvement. See results for Improvement Alternatives with Future Conditions Tailwater models located in ***Appendix B – Model Results.***

5.4. Long-Range Resilient Alternatives

The need for additional improvements in future conditions resulted in the development of Long-Range Resilient Alternatives. These alternatives represent the Improvement Alternatives with additional changes made to try to reach the desired level of service in future conditions. The improvements proposed in the Long-Range Resilient Alternatives focused on addressing portions of the Assessment Areas that are below the future sea level of 4.4 feet.

For these locations, stormwater pump stations were proposed. Unlike gravity systems, the pump stations assume that there is no backflow into the modeled pipe network. Initial stages for nodes upstream of the Long-Range Resilient Alternative proposed pump stations were lowered from the future conditions tailwater elevation of 4.4 feet to a lowered initial stage equal to the pump off elevation. The pump stations were preliminarily sized to match flow results from the corresponding outfalls in the Improvement Alternatives Analysis. Changes to pump station flow occurred during refinement as needed. New pipe connections were added to connect existing pipes to the proposed pump stations as needed.

For areas connected to the downstream waterbodies via overland flow weirs, if the weir invert was below 4.4 feet, the weir was altered to prevent flow from the outfall waterbodies into the Assessment Area. The weirs were altered to reflect one of three conditions:

- The proposal of a Long-Range seawall with an elevation of at least 4.4 feet
- The raising of an existing seawall to an elevation higher than 4.4 feet
- The raising of a roadway crown or shoulder to an elevation higher than 4.4 feet

The modeled node storage was not changed in areas where raising a road was proposed.

The Long-Range Resilient Alternatives models were refined two times per Assessment Area to develop the final alternative schematics. Note that while these alternatives attempted to achieve the LOS goals, this was typically not achievable. As such, the focus was on reducing flooding in the future condition. A summary of the resulting Long-Range Resilient Alternatives is included in ***Table 5-1***.

Table 5-1 Long-Range Resilient Alternatives

Alternative ID	Improvement Alternative	Additional Long-Range Resilience Improvements
A1	Upsize and Add Pipes	Pumps at lakes and Crayton Rd
A2	Master Pump Station	Pumps at lakes and Crayton Rd
B2	Naples Bay Pump Stations	Proposed seawalls

Alternative ID	Improvement Alternative	Additional Long-Range Resilience Improvements
B3	Pipes upsized with new connections	Proposed pumps and seawalls
C2	Master Pump Stations	Additional proposed pump and seawalls
C3	Pump Stations and Gravity Outfalls	Additional proposed pump and seawalls
D2	Upsize Pipes and add Pump	Additional proposed pump and raising roads
D3	Fully Disconnect from Public Works Pump	Proposed pump stations and raising roads
E1	Upsize Pipes Only	Proposed pump station and seawalls
E2	Add Pump Station with Connection	Proposed seawalls and additional pump station

Appendix B – Model Results included results of the Long-Range Resilient Alternatives for all of the Assessment Areas. Schematics of these alternatives are in ***Long-Range Resilient Alternatives Exhibit Section.***

5.5. Long-Range Resilient Alternatives with Existing Tailwater

An additional analysis was performed to understand the impact of the Long-Range Resilient Alternatives. This was achieved by updating the Long-Range Resilient Alternatives to reflect the tailwater and associated initial conditions of 1.59 feet. ***Appendix B – Model Results*** includes the results of Long-Range Resilient Alternatives with Existing Tailwater.

5.6. Summary of Model Results

In the future, extensive infrastructure upgrades will be required to combat the rising sea level. Land along the outfall waterbodies will need to be protected by increasing seawall height to prevent constant overtopping and backflow into the system from the waterbodies that surround the City. The higher sea level means that gravity flow will no longer be effective at reducing flooding in most areas. New and upsized pump stations will need to be implemented in addition to what was proposed in the Improvement Alternatives. Additional connectivity will be required to connect infrastructure to pump stations to better serve areas throughout the City. The below sections include a summary of the Long-Range Resilient Improvements proposed. Schematics of these alternatives are in ***Long-Range Resilient Alternatives Exhibit Section.***

5.6.1. Assessment Area A

Based on the Baseline Future Conditions Model, increased flooding associated with the higher tailwater condition was much more prevalent west of Devils Lake and Swan Lake due to the lower pipe elevations and direct connection to Venetian Bay. Additionally, the control structures connecting Devils Lake and Swan Lake to Venetian Bay are controlled at a lower elevation than the future tailwater condition, resulting in increased water elevations in the lakes when the tailwater is at its peak.

Long-Range Alternatives 1A and 2A both incorporated pumps at Devils Lake, Swan Lake, and Crayton Road. For Improvement Alternative 1A, new pipe connections were evaluated to connect roadway inlets to proposed pump stations. Pipe connections that discharge to the Bay where upstream discharge are proposed to be rerouted and the existing pipes plugged. This eliminated a number of proposed pump stations but did not completely eliminate modeled flooding. For Alternative 2A, proposed pumps were added to each gravity outfall, and new pipe connections were not added to minimize the number of proposed pump flows. It was determined that adding more pump stations was more effective than adding fewer pump stations with gravity connections, but this comes with additional maintenance concerns.

5.6.2.Assessment Areas B

Based on the Baseline Future Conditions Model, there are several areas where road elevations and overland flow elevations from the Assessment Area into the Naples Bay are lower than the future conditions tailwater of 4.4'. As a result, there is widespread modeled flooding in future conditions. Modeled flood reduction can only occur in future conditions if overland flow from the outfall waterbodies at elevations lower than 4.4' is eliminated.

In both Long-Range Alternative 2B and Alternative 3B, seawalls are proposed to be constructed and raised to prevent inflow from Naples Bay into the assessment area in high tide conditions. In the model, this is reflected by raising weirs that connect the Assessment Area and Naples Bay to elevations higher than 4.4'. As a result, there is not a way for water to flow to or from the tailwater nodes into the Assessment Area through overland flow in either of the Long-Range Alternatives.

In some locations in existing conditions, Assessment Areas discharged both by pipe and by overland flow. With the higher tailwater condition, and the addition of sea walls, the overland flow out of the Assessment Areas are blocked, which results in higher modeled inundation within the Assessment Areas. Due to the high tailwater condition and elimination of overland, pump stations are required in future conditions to achieve any level of modeled flood improvement. In Alternative 2B already proposed , there are already large pump stations proposed prior to future conditions modeling. As a result, future improvements to stormwater outfalls are limited to two new pump stations at the remaining gravity outfalls. In Alternative 3B, pump stations are proposed at each gravity outfall. This results in more smaller pump stations being installed as opposed to the larger pump stations in 2B. Results for Alternative 3B show less modeled flood reduction than 2B, which implies that the large master pump stations are more effective than the larger number of more, smaller pumps.

5.6.3.Assessment Area C

Based on the Baseline Future Conditions Model, there are several areas where road elevations and overland flow elevations from the Assessment Area into the Naples Bay and are lower than the future conditions tailwater of 4.4'. As a result, there is widespread modeled flooding in future conditions and modeled flood reduction can only occur in future conditions if overland flow from the outfall waterbodies at elevations lower than 4.4' is eliminated.

In Alternative 2C, as pump stations were already designed to capture runoff from most of assessment area in current conditions. As a result, the Alternative 2C Improvement Alternative required fewer additional improvements and showed more modeled flood improvement than Alternative 3C. Note that seawalls were proposed throughout the Assessment Area in both alternatives.

5.6.4.Assessment Area D

Based on the Baseline Future Conditions Model, there are several areas where road elevations and overland flow elevations from the Assessment Area into the Gordon River and are lower than the future conditions tailwater of 4.4'. As a result, there is widespread modeled flooding in future conditions and modeled flood reduction can only occur in future conditions if overland flow from the outfall waterbodies at elevations lower than 4.4' is eliminated.

In both Alternatives, remaining gravity outflows were either converted to pump stations or modeled to include a check valve that would prevent inflow from the River. In Alternative 2D, the connection from Central Ave to the Public Works Pump had to be removed to show modeled flood improvement in this area, as is shown in Alternative 3D. In Alternative 2D, there is one pump station proposed to serve 5th Ave N at the northern outfall, while the southern 5th Ave N outfall has a check valve. In Alternative 3D, both outfalls have a pump outfall with half the pump capacity of the single outfall shown in Alternative 2D. Both alternatives show similar levels of flood improvement along 5th Ave N.

In Alternative 3D, there is a large pump station proposed for all gravity outfalls for Central Ave, while in Alternative 2D, the outfall for Central Ave remains the same as the outfall shown in the present Improvement Alternative with an additional check valve. There is significantly more modeled flood reduction in Alternative 3D than Alternative 2D, as the future conditions pump has more capacity than the pump modeled in Alternative 2D. As a result, it is concluded that flood improvement in this area is directly tied to proposed pump capacity in future conditions.

5.6.5.Assessment Area E

Based on the Baseline Future Conditions Model, there are several areas where road elevations and overland flow elevations from the Assessment Area into the Gordon River and are lower than the future conditions tailwater of 4.4'. As a result, there is widespread modeled flooding in future conditions and modeled flood reduction can only occur in future conditions if overland flow from the outfall waterbodies at elevations lower than 4.4' is eliminated.

In Alternatives 1E and 2E, seawalls and pumps are proposed throughout the assessment area. As Alternative 2E already proposes pumps and pipe connections, the improvements shown west of the Gordon River are mostly limited to the proposal of seawalls. In Alternative 1E, the improvements shown in future conditions represent new improvements, which allowed for added pipes along 5th Ave to be larger than what was proposed in present conditions for Alternative 2E. As a result, flooding improvement for alternative 1E was greater than Alternative 2E. It is concluded that while large-scale improvements are not needed in present conditions, which is unlike other Assessment Areas, they will still be required in future conditions due to sea level rise.

6. Benefit and Cost Analysis

6.1. Final Alternative Selection

The two existing condition refined alternatives, referred to as the Improvement Alternatives, were presented to the City for discussion and to select one alternative (the Selected Improvement Alternative or Final Selected Alternative). As part of this selection process, items such as flood reduction effectiveness, LOS criteria satisfaction, relative project costs, phasing flexibility, changes to water quality, and operation and maintenance needs were considered. A summary of the items considered in this selection are summarized in a decision support matrix which can be found in ***Decision Support Matrix Exhibit Section***.

Table 6-1 summarizes the selected alternative in each Assessment Area along with the main reason that these alterantives were selected. The Final Selected Alternative was then used to develop project layouts and estimated project costs and benefits.

Table 6-1 Selected Improvement Alternatives

Alternative ID	Improvement Alternative	Additional Long-Range Resilience Improvements	Reason
1A	Upsize and Add Pipes	Pumps at lakes and Crayton Rd	Results were similar between 1A and 2A, but Alternative 2A included more costs because of the pump stations, therefore Alternative 1A was selected.
2B	Naples Bay Pump Stations	Pumps at lakes and Crayton Rd	Modeled flood improvement differed slightly in certain areas but both alternatives were generally effective. In future conditions, Alternative 2B was more effective and required fewer additional changes, therefore Alternative 2A was selected.
2C	Master Pump Stations	Proposed pumps and seawalls	Alternative 2C showed better modeled flood improvement than 3C and both improvements showed pump stations in existing and future conditions, therefore Alternative 2C was selected.
3D	Fully Disconnect from Public Works Pump	Additional proposed pump and raising roads	Alternative 3D allows for proposed stormwater systems to operate independently from Public Works Pump and have flexibility for pumps in future conditions, therefore Alternative 3D was selected.
1E	Upsize Pipes Only	Proposed pump stations and raising roads	Alternative 1E demonstrated the same improvement as E2 with significantly less infrastructure improvement, therefore Alternative 1E was selected.

6.2. Final Selected Alternatives Layouts

Exhibits were created to show the layout of each of the Improvement Alternatives. These can be found in the ***Improvement Alternatives Exhibit Section***. For each Assessment Area, the following four layouts are provided.

- Selected Improvement Alternative Layout with 10-year, 1-hour storm results
- Selected Improvement Alternative Layout with 25-year, 72-hour storm results
- Unselected Improvement Alternative Layout with 10-year, 1-hour storm results
- Unselected Improvement Alternative Layout with 25-year, 72-hour storm results
- Each of the Selected Improvement Alternatives layouts are identified by a green text box noting that the layout is a Selected Improvement Alternative. Each layout contains the following layers. Modeled nodes
- Proposed pump station
- Existing pump station that is proposed to be upsized
- Existing pump station to remain as is
- Proposed pipe
- Existing pipe that is proposed to be upsized
- Existing pipes to be plugged
- Existing pipes to remain as they are
- Modeled basins
- Assessment Area boundary
- Existing Condition Model baseline floodplains
- Improvement Alternative Model floodplains

These layouts can be reviewed to understand the changes to the existing system in the Improvement Alternatives.

6.3. Final Selected Alternatives Costs

An Engineer's Opinion of Probable Cost (EOPC) was prepared for the selected alternative based on the estimated construction and easement costs of the conceptual project layouts. The construction cost associated with each project was estimated using values from the FDOT Historical Cost Index which provides 6-month and 12-month moving averages for the construction costs of items in projects across Florida. 6-month averages were used when possible. When items were missing from the 6-month averages, the 12-month average costs were used.

Several proposed pipes in Assessment Area A will need new drainage easements. These proposed pipes are proposed through private land and therefore easement acquisition costs were included in these EOPC. Easement acquisition costs were estimated using a rate of $2.5 million per acre determined based on recent cost information provided by the City. The easement acquisition cost was calculated by multiplying that cost per area by the estimated area required for the proposed easement. Easement sizes were calculated based on the size of the proposed pipes. It was assumed that in all Assessment Areas existing easements or right-of-way provided adequate room for proposed pipes and no easement or right-of-way acquisition costs were calculated for proposed pipes within existing drainage easements or rights-of-way.

Pump station costs were estimated using quotes for Flygt pump models. Pump station were assumed to be triplex pump stations with a backup generator and a platform to elevate the pumps above estimated sea level rise. Estimates for wet well constriction, electrical work, additional water quality diversion structures, outfall dissipation structures, and trash rack structures were also included. Three phase power lines are not available at each proposed pump station location and due to the potential power draw for the proposed pump stations additional costs were added to account for potential construction of power infrastructure where applicable. EOPCs prepared for this report are attached and found in ***Engineer's Opinion of Probable Costs Exhibit Section***. The EOPCs include an estimated cost for each improvement alternative as well as the cost to make additional long-range improvements. The estimated costs per Assessment Area are included in ***Table 6-2***.

Table 6-2 EOPC per Assessment Area

Assessment Area	Cost of Improvement Alternative	Additional Long-Range Improvement Cost	Total Cost of Improvement in Future Conditions
A	$19,900,000	$97,500,000	$117,400,000
B	$49,900,000	$57,800,000	$107,700,000
C	$85,100,000	$43,900,000	$129,000,000
D	$32,800,000	$56,500,000	$89,300,000
E	$900,000	$84,900,000	$85,800,000
Total	$188,600,000	$340,600,000	$529,200,000

6.4. Estimated Benefits of Selected Alternatives

6.4.1.Hedonic Modeling

ICF was contracted as a subconsultant to estimate benefits of the selected alternatives. ICF's analysis compared as-is modeled flooding conditions to proposed modeled flooding conditions to determine the monetary value of avoided damages and property value benefits for the proposed improvements. The ICF Analysis evaluates these benefits based on the results for the two modeled storm events (10yr-1hr and 25yr-72hr) and estimates benefits in 2023 dollars. Kimley-Horn prepared a cost-benefit analysis based on the project cost calculated in the EOPC and estimated benefits calculated by ICF. Portions of the below were taken from a report provided by ICF; the full report including the Technical Appendix can be found in ***Appendix C – Supporting Documentation***.

6.4.2.Damage Assessment Modeling

6.4.2.1. Damage Assessment Introduction

This section of the report focuses on ICF's estimation of the benefits of avoiding potential economic impacts due to flooding, focusing on the following factors:

- Property damage
- Commercial disruption
- Roadway impacts
- Property value impacts
- Property tax impacts

The combination of these components provides a holistic view of the potential flooding impacts by examining impacts to homeowners (e.g., property damages and property value impacts), business owners (e.g., commercial disruption), and City government operations (e.g., roadway impacts and tax revenue implications).

ICF evaluated flooding impacts across four condition sets for both the 10-year flood and 25-year flood, considered in the hydraulic modeling portion of the project. These scenarios consider sea-level rise impacts (e.g., existing conditions with no modeled sea level rise versus future conditions with sea level rise) as well as modeled improvements (e.g., no improvements versus proposed improvements). Results in this section are presented across these condition sets for the 50-year period of 2040 to 2090, in 2023 dollars:

- Existing Conditions with no improvements (EC no Inv)
- Existing Conditions with proposed improvements (EC Inv)
- Future Conditions with no improvements (FC no Inv)
- Future Conditions with proposed improvements (FC Inv)

ICF presents property damages, commercial damages, and roadway damages as expected damages, meaning that they are probabilistic in nature.[1] ICF estimated that 10-year flood and the 25-year flood would have a probability of occurring in any given year of 10 percent (1/10) or 4 percent (1/25), respectively.[2] ICF estimates damage amounts by multiplying the risk rate for any given year a flood could occur by the damages that would ensue for a flood actually occurring in that year.

The City of Naples will be subject to damage from other types of storms, not exclusively the 10-year and 25-year floods. Such storms could include a 50-year flood, a 100-year flood, or other tropical storms and hurricanes. Kimley-Horn and ICF did not model the flood inundation or economic impacts associated with additional storm types in this report. Therefore, the results in this analysis are a very conservative estimate of the benefits the City of Naples could expect by making flood resilience investments.

The rest of this section is divided into six sections that present the high-level methodology and results, including 1) property damages, 2) commercial damages, 3) roadway damages, 4) property value impacts, 5) property tax impacts and 6) summary results. Detailed technical explanations of the methodologies can be found in ***Appendix C – Supporting Documentation***.

6.4.2.2. Property Damage

Flood inundation can result in significant damage to both building structures and contents, and the prevention of these flood waters results in avoided property damages. To estimate condition-, flooding scenario- and property-specific inundation damages, ICF utilized depth-damage functions (DDFs) matched to residential properties' inundation levels to determine both the structural and contents damages of each scenario-property combination. ICF then applied a risk rate and summed these expected damage amounts across properties and years for the period 2040 to 2090.

[1] ICF did not compute property value impacts and tax revenue impacts using expected value methodology.
[2] ICF assumed the probability of a 10-year flood occurring in any given year was independent of the occurrence of a 25-year flood in the same year. The independence of these events implies that the expected damages from each may be summed within a given year for a specific damage type.

ICF adopted residential DDFs for freshwater flooding calculated by the U.S Army Corps of Engineers (USACE) for this analysis.[3] Specifically, ICF used four separate DDFs for either single-family or multi-family residential properties as well as the respective damages to a property's structure and contents. We used structural DDFs to calculate the residential property damages to the underlying structure of a property, and contents DDFs to calculate the damage to household goods contained within a property (e.g., furniture, electronics, media, or other personal goods). ICF applied both individually for each property to calculate the total expected damages caused by flood inundation. DDFs are stepwise functions where each incremented level of inundation corresponds to a percentage of damage in terms of housing value. DDF's inundation levels used in this analysis are provided in half-foot increments, ranging from -1.5 feet to 15.0 feet, in which 0 represents the first finished floor elevation and negative inundation levels from -0.5 to -1.5 are below that.

To estimate the flood inundation of each residential property under each condition set, ICF subtracted each property's imputed first-floor elevation (FFE) by condition-set specific inundation data provided by Kimley-Horn.4 This calculation returned the net inundation levels across the residential properties assessed for each condition-flooding combination. ICF rounded these net inundation results to the nearest half-foot increment to correspond to the inundation levels in the DDFs. For each condition set, ICF matched each property and net inundation to the appropriate DDFs to attain structural and contents percent damages.

The property value assessments available for City of Naples' residential properties are from 2022. We used a growth rate of 3.79 percent to inflate the property values to 2023. We further assume property values stay constant until 2040 and during the analysis period from 2040 to 2090.5 For each condition set, we multiplied each property's assessment amount (in 2023 dollar terms) by either the structural or contents damage percentage matched from the DDFs and by a risk rate associated with the storm type (e.g., 10 percent for the 10-year 1-hour flood and 4 percent for the 25-year 72-hour flood) to account for the probability of storm occurrence.6 We then summed structural and contents damages for each property to estimate the total expected property damages from 2040 to 2090.

For the overall analysis period from 2040 to 2090, the sum of expected residential property damages under existing conditions, without resilience investments, are estimated at $15.3 million for the 10-Year storm, and $13.3 million for the 25-Year storm, for a total of $28.6 million. For existing conditions with resilience investments, expected residential property damages are estimated at $0.1 million for the 10-Year storm and $0.5 million for the 25-Year storm, for a 50-year total of $0.6 million over the full analysis period. The avoided damages, or benefits, of resilience investments can be determined by subtracting the existing conditions, with investment, total from the existing conditions, no investment, total. This calculation results in the avoided property damage benefits of resilience investment under existing conditions of $27.9 million over 50 years.

Expected residential property damage estimates under future conditions are similar. For future conditions, without resilience investments, expected residential property damages are estimated at $74.2 million for

[3] DDFs used from the USACE also assume a flooding duration of 72 hours or less, cement slab foundations, and the middle-ground level of damages, as opposed to other DDFs available assuming saltwater flooding, flooding durations greater than 72 hours, foundations on piers, and minimum or maximum damages.
[4] Imputed FFEs were collected from properties' FFE certifications or from a summarized FFE level specific to a representative point among City of Naples' residential properties.
[5] The property growth rate of 3.79 percent was derived from the U.S. Census Bureau's American Community Survey (ACS) by calculating the 10-year compound annual growth rate of median housing value for Collier County, FL. All benefits are calculated in 2023 dollar terms so that the analysis can hold inflation effects constant. Property values are likely to continue appreciation past 2023, however, ICF did not continue inflating property values so that all benefits could be calculated in 2023 dollar terms.
[6] While other storm types, such as 5-year and 50-year floods, as well as major hurricanes also pose flood risk to the assessed areas, this analysis was limited to the impacts of 10-year and 25-year storms.

the 10-Year storm, and $32.2 million for the 25-Year storm, for a total of $106.4 million over the analysis period. For future conditions with resilience investments, expected residential property damages are estimated at $0.1 million for the 10-Year storm and $1.8 million for the 25-Year storm, for a 50-year total of $1.9 million. The avoided property damages, or benefits, of resilience investments under future conditions total $104.5 million over 50 years.

Table 6-3 shows these figures for residential property damages by assessment area, condition set, storm type, and associated deltas (benefits) and totals.

Table 6-3: 50 Year Total of Residential Property Damages for 10-Year and 25-Year Storms Under Existing and Future Conditions (2023 Dollars in Thousands)

		Condition Sets					
Storm Type	**Assessment Area**	**EC - No Inv**	**EC - Inv**	**EC Benefits**	**FC - No Inv**	**FC - Inv**	**FC Benefits**
10-Year	A	$3,478	$87	$3,391	$4,751	$91	$4,660
	B	$4,331	$-	$4,331	$12,781	$-	$12,781
	C	$6,677	$-	$6,677	$43,728	$-	$43,728
	D	$795	$-	$795	$3,052	$-	$3,052
	E	$25	$4	$21	$9,852	$10	$9,842
	Total	**$15,307**	**$91**	**$15,216**	**$74,164**	**$101**	**$74,063**
25-Year	A	$2,055	$68	$1,987	$4,112	$201	$3,911
	B	$3,902	$448	$3,454	$5,112	$448	$4,664
	C	$6,936	$6	$6,930	$17,853	$1,129	$16,725
	D	$351	$-	$351	$1,221	$2	$1,219
	E	$12	$4	$8	$3,941	$7	$3,934
	Total	**$13,256**	**$526**	**$12,730**	**$32,239**	**$1,786**	**$30,453**
Grand Total	A	$5,533	$155	$5,378	$8,863	$292	$8,571
	B	$8,233	$448	$7,785	$17,893	$448	$17,445
	C	$13,614	$6	$13,608	$61,581	$1,129	$60,453
	D	$1,146	$-	$1,146	$4,273	$2	$4,270
	E	$37	$7	$30	$13,792	$16	$13,776
	Total	**$28,563**	**$617**	**$27,946**	**$106,403**	**$1,887**	**$104,516**

Note: Blank cells denoted with "-" indicate that there were no damages under a respective assessment area.

6.4.2.3. Commercial Damages

Businesses can experience revenue losses because flooding inundation interrupts business operations, either by direct flooding or by isolating businesses so customers cannot reach the stores. For this analysis, we assumed that commercial properties suffer revenue losses and are unable to operate entirely while inundated due to storm water. To estimate commercial business disruptions, this analysis uses Collier County-specific data on business revenues coupled with flood duration data from the hydraulic model.

To estimate the daily revenue of businesses in City of Naples, we relied on U.S. Census Bureau data from the 2017 Economic Census (filtered for Collier County and by NAICS industry). We calculated business-specific, daily revenue figures by dividing industry-specific total annual revenues by the number of establishments in each industry and number of days in the year. Next, we developed a crosswalk between the use-codes, or building types, available in data on City of Naples' properties and NACIS codes to match the daily per-business revenue amounts to commercial properties.

Kimley-Horn estimated flood duration estimates (in hours) across the study area. ICF then identified which commercial properties were affected based on the storm type and condition set. This data transformation resulted in the number of days in which specific business would be disrupted (see ***Appendix C – Supporting Documentation*** for a detailed description of data manipulation steps). ICF then matched the days of flooding and the daily revenue figures for each commercial property in the study area. For each storm type and condition set, we calculated commercial business disruption by multiplying daily revenue by the number of days flooded and further by the risk rate associated with the storm type (e.g., 10 percent for the 10-year 1-hour flood and 4 percent for the 25-year 72-hour flood).

To be consistent with the cost estimation method, we keep our benefits in 2023 dollar year terms.7

For the overall analysis period from 2040 to 2090, the sum of expected commercial business disruptions under existing conditions, without resilience investments, are estimated at $0.6 million for the 10-Year storm, and $1.3 million for the 25-Year storm, for a total of $1.9 million. For existing conditions with resilience investments, expected commercial business disruptions are estimated at $0.6 million for the 10-Year storm and $1.3 million for the 25-Year storm, for a 50-year total of $1.9 million over the period of analysis. The avoided damages, or benefits, of resilience investments can be determined by subtracting the existing conditions, with investment, total from the existing conditions, no investment, total. This calculation results in avoided commercial disruption benefits of resilience investment under existing conditions of $17,000 over 50 years.

Commercial business disruption estimates under future conditions are substantially higher. For future conditions, without resilience investments, expected commercial business disruptions are estimated at $6.6 million for the 10-Year storm, and $4.7 million for the 25-Year storm, for a total of $11.4 million over the full analysis period. For future conditions with resilience investments, expected commercial business disruptions are estimated at $0.6 million for the 10-Year storm and $0.9 million for the 25-Year storm, for a 50-year total of $1.5 million. The avoided commercial damages, or benefits, of resilience investments under future conditions total $9.9 million over 50 years. We find that the future conditions expected commercial disruptions are much higher than existing conditions due to the intensity of flooding under future conditions.

Table 6-4 shows these figures for expected commercial business disruptions by assessment area, condition set, storm type, and associated deltas and totals.

Table 6-4: 50 Year Total of Commercial Business Disruption for 10-Year and 25-Year Storms Under Existing and Future Conditions (2023 Dollars in Thousands)

Storm Type	Assessment Area	Condition Sets					
		EC - No Inv	EC - Inv	EC Benefits	FC - No Inv	FC - Inv	FC Benefits
10-Year	A	$590	$588	$2	$5,349	$590	$4,760
	B	$1	$-	$1	$775	$-	$775
	C	$-	$-	$-	$505	$-	$505
	D	$-	$-	$-	$12	$-	$12
	E	$-	$-	$-	$-	$-	$-
	Total	**$590**	**$588**	**$3**	**$6,641**	**$590**	**$6,052**
25-Year	A	$1,326	$1,322	$5	$2,140	$878	$1,262
	B	$1	$-	$1	$1,551	$-	$1,551
	C	$9	$-	$9	$1,010	$-	$1,010

[7] A constant inflation rate of 3.0 percent is used to adjust for inflation to 2023.

Storm Type	Assessment Area	Condition Sets: EC - No Inv	EC - Inv	EC Benefits	FC - No Inv	FC - Inv	FC Benefits
	D	$-	$-	$-	$8	$-	$8
	E	$-	$-	$-	$-	$-	$-
	Total	**$1,336**	**$1,322**	**$15**	**$4,708**	**$878**	**$3,830**
Grand Total	A	$1,916	$1,909	$7	$7,489	$1,467	$6,022
	B	$1	$-	$1	$2,326	$-	$2,326
	C	$9	$-	$9	$1,515	$-	$1,515
	D	$-	$-	$-	$20	$-	$20
	E	$-	$-	$-	$-	$-	$-
	Total	**$1,927**	**$1,909**	**$17**	**$11,350**	**$1,467**	**$9,882**

6.4.2.4. Sensitivity of Methodology

The expected commercial business disruption damages estimated above are likely an underestimate of the true impact of such flooding due to the assumptions used in this analysis. First, the disruption impacts are limited to when the businesses are inundated. The benefits model assumes that business returns to 100 percent of pre-flood activity as soon as waters recede. There are likely substantial additional days of closure or operation below 100 percent of pre-flood revenue levels while businesses remediate storm damage. These remediation measures can take months.8 Second, the remediation measures required to re-open may require structural repairs to the business's building which are not captured in the estimates above.

To estimate the impact of the first assumption, ICF performed a sensitivity on the commercial business disruption figures using the method described above but added a flat 1 week (7 days) of 100 percent revenue loss to each property which experienced inundation in either the existing or future conditions scenarios. Properties which were not inundated in either scenario or storm type were still presumed to continue operating as normal. ICF performed a further sensitivity using the same method but assumed an additional 90 days of 100 percent revenue loss due to flood remediation disruptions. The results of the sensitivity analyses are presented in **Table 6-5** (existing conditions) and **Table 6-6** (future conditions) below.

[8] "Benefit-Cost Analysis Sustainment and Enhancements: Standard Economic Value Methodology Report." Federal Emergency Management Agency. May 2023. https://www.fema.gov/sites/default/files/documents/fema_standard-economic-values-methodology-report_2023.pdf. See report's Table 4, "Recovery Time by Occupancy Type and Flood Depth." The table reports Physical Restoration Time of Retail Trade between 7 and 13 months for inundation between 0 and 4 feet.

Table 6-5: 50 Year Total of Commercial Business Disruption for 10-Year and 25-Year Storms Under Existing Conditions 7 and 90-Day Disruption Sensitivities, (2023 Dollars in Thousands)

Storm Type	Assessment Area	Existing No Inv Total Disruptions	Existing No Inv Plus 7 days flooding	Existing No Inv Plus 90 days flooding	Existing Inv Total Disruptions	Existing Inv Plus 7 days flooding	Existing Inv Plus 90 days flooding	Existing Delta Total Disrupt Delta	Existing Delta Plus 7 Delta	Existing Delta Plus 90 Delta
			[A]	[B]		[C]	[D]		[E] = [A] – [C]	[F] = [B] – [D]
10-Year	A	$590	$7,550	$90,075	$588	$7,548	$90,073	$2	$2	$2
	B	$1	$187	$2,396	$-	$-	$-	$1	$187	$2,396
	C	$-	$-	$-	$-	$-	$-	$-	$-	$-
	D	$-	$-	$-	$-	$-	$-	$-	$-	$-
	E	$-	$-	$-	$-	$-	$-	$-	$-	$-
	Total	**$590**	**$7,736**	**$92,470**	**$588**	**$7,548**	**$90,073**	**$3**	**$189**	**$2,398**
25-Year	A	$1,326	$4,110	$37,120	$1,322	$4,106	$37,116	$5	$5	$5
	B	$1	$112	$1,433	$-	$-	$-	$1	$112	$1,433
	C	$9	$1,061	$13,532	$-	$-	$-	$9	$1,061	$13,532
	D	$-	$-	$-	$-	$-	$-	$-	$-	$-
	E	$-	$-	$-	$-	$-	$-	$-	$-	$-
	Total	**$1,336**	**$5,284**	**$52,085**	**$1,322**	**$4,106**	**$37,116**	**$15**	**$1,178**	**$14,969**
Grand Total	A	$1,916	$11,660	$127,195	$1,909	$11,653	$127,188	$7	$7	$7
	B	$1	$299	$3,829	$-	$-	$-	$1	$299	$3,829
	C	$9	$1,061	$13,532	$-	$-	$-	$9	$1,061	$13,532
	D	$-	$-	$-	$-	$-	$-	$-	$-	$-
	E	$-	$-	$-	$-	$-	$-	$-	$-	$-
	Total	**$1,927**	**$13,020**	**$144,555**	**$1,909**	**$11,653**	**$127,188**	**$17**	**$1,367**	**$17,367**

Table 6-6: 50 Year Total of Commercial Business Disruption for 10-Year and 25-Year Storms Under Future Conditions 7 and 90-Day Disruption Sensitivities, (2023 Dollars in Thousands)

Storm Type	Assessment Area	Future No Inv			Future Inv			Future Delta		
		Total Disruptions	Plus 7 days flooding	Plus 90 days flooding	Total Disruptions	Plus 7 days flooding	Plus 90 days flooding	Total Disrupt Delta	Plus 7 Delta	Plus 90 Delta
			[A]	[B]		[C]	[D]		[E] = [A] – [C]	[F] = [B] – [D]
10-Year	A	$5,349	$12,309	$94,834	$590	$7,550	$90,075	$4,760	$4,760	$4,760
	B	$775	$5,118	$56,610	$-	$-	$-	$775	$5,118	$56,610
	C	$505	$3,332	$36,855	$-	$-	$-	$505	$3,332	$36,855
	D	$12	$2,641	$33,817	$-	$-	$-	$12	$2,641	$33,817
	E	$-	$-	$-	$-	$-	$-	$-	$-	$-
	Total	**$6,641**	**$23,401**	**$222,117**	**$590**	**$7,550**	**$90,075**	**$6,052**	**$15,851**	**$132,042**
25-Year	A	$2,140	$4,924	$37,934	$878	$3,662	$36,672	$1,262	$1,262	$1,262
	B	$1,551	$3,288	$23,885	$-	$-	$-	$1,551	$3,288	$23,885
	C	$1,010	$2,141	$15,550	$-	$-	$-	$1,010	$2,141	$15,550
	D	$8	$1,060	$13,530	$-	$-	$-	$8	$1,060	$13,530
	E	$-	$-	$-	$-	$-	$-	$-	$-	$-
	Total	**$4,708**	**$11,412**	**$90,898**	**$878**	**$3,662**	**$36,672**	**$3,830**	**$7,750**	**$54,227**
Grand Total	A	$7,489	$17,233	$132,768	$1,467	$11,211	$126,746	$6,022	$6,022	$6,022
	B	$2,326	$8,406	$80,495	$-	$-	$-	$2,326	$8,406	$80,495
	C	$1,515	$5,473	$52,405	$-	$-	$-	$1,515	$5,473	$52,405
	D	$20	$3,701	$47,347	$-	$-	$-	$20	$3,701	$47,347
	E	$-	$-	$-	$-	$-	$-	$-	$-	$-
	Total	**$11,350**	**$34,813**	**$313,015**	**$1,467**	**$11,211**	**$126,746**	**$9,882**	**$23,601**	**$186,269**

The sensitivity for 7 additional days of 100 percent revenue loss shows $1.4 million in benefits under existing conditions for both the 10-year and 25-year storms together and $23.6 million under future conditions for both storms together in 2023 dollars. This is a minimum case sensitivity to understand what the impact would be for one week's additional expected business disruption at 100 percent revenue loss. This 7-day disruption sensitivity calculation results in avoided commercial disruption damages of $1.4 million under existing conditions and $23.6 million under future conditions, over 50 years.

The sensitivity for 90 additional days of 100 percent revenue loss shows $17.4 million under existing conditions and $186.3 million under future conditions, considering both storms. This 90-day sensitivity calculation results in avoided commercial disruption damages of $17.4 million for existing conditions and $186.3 million in benefits under future conditions, over 50 years.

Commercial business recovery of 100 percent revenue immediately after flood waters recede represents an underestimate of actual disruption and an overly conservative estimation of benefits. ICF believes that there would be substantial additional days of closure or operation below 100 percent of pre-flood revenue levels while the operator remediates from storm damage. Therefore, ICF believes the 90-day additional disruption values are the most reasonable estimates, and in further summaries of total benefits ICF only shows the benefits associated with the 90-day addition to commercial disruption.

6.4.2.5. Roadway Damages

Roadways can be damaged by flooding in a similar manner to other assets. This analysis examined the number of roadways in the City of Naples damaged under various scenarios and storm types. The analysis assigned a damage amount based on estimated cost to repair the road segment.

The roadway damages were estimated using inundation data provided by Kimley-Horn through hydraulic modelling. ICF considered a road damaged if it was inundated by any amount during a storm event, under either existing or future conditions scenario. Road segment damages were based on the estimated cost to repair the damaged road per linear foot. ICF grouped roads into three classes, each with a different cost to repair per linear foot. The classes include, "Arterial," "Collector," and "Local". **Table 6-7** shows the estimated cost to repair each class of road.[9]

Table 6-7: Roadway Damages Cost to Repair by Roadway Class

Class	Cost to Repair / ft (2023 Dollars)
Arterial	$247
Collector	$185
Local	$62

We estimated expected roadway damages in each year of the analysis period (2040-2090), for each condition set and storm type. For a given storm type and condition set we estimated total linear feet of inundated roadway, by roadway class in each assessment area. We multiplied total linear feet inundated by the risk rate associated with the storm type (e.g., 10 percent for the 10-Year 1-Hour)

[9] See ***Appendix C – Supporting Documentation*** for additional calculations and documentation.

and the roadway cost of repair per linear foot. We then summed the expected damage amounts across all years in the analysis period and assessment areas.

The sum of expected roadway damages under existing conditions, without resilience investments, are estimated at $14.6 million for the 10-Year storm, and $8.0 million for the 25-Year storm, for a total of $22.6 million over the full analysis period. For existing conditions with resilience investments, expected roadway damages are estimated at $0.3 million for the 10-Year storm and $1.1 million for the 25-Year storm, for a 50-year total of $1.4 million. The avoided damages, or benefits, of resilience investments can be determined by subtracting the existing conditions, with investment, total from the existing conditions, no investment, total. This calculation results in avoided roadway damage benefits of resilience investment under existing conditions of $21.2 million over 50 years.

Roadway damage estimates under future conditions are similar, but higher. For future conditions, without resilience investments, expected roadway damages are estimated at $23.4 million for the 10-Year storm, and $10.1 million for the 25-Year storm, for a total of $33.5 million over 50 years. For existing conditions with resilience investments, expected roadway damages are estimated at $1.1 million for the 10-Year storm and $2.0 million for the 25-Year storm, for a 50-year total of $3.1 million. The avoided roadway damages, or benefits, of resilience investments under future conditions total $30.5 million over 50 years.

Table 6-8 shows these figures by assessment area, condition set, storm type, and associated deltas and totals.

Table 6-8: 50 Year Total of Roadway Damages (Risk Weighted) for 10-Year and 25-Year Storms Under Existing and Future Conditions (2023 Dollars in Thousands)

Storm Type	Assessment Area	Condition Sets					
		EC - No Inv	EC - Inv	EC Benefits	FC - No Inv	FC - Inv	FC Benefits
		[A]	**[B]**	**[C] = [A] – [B]**	**[D]**	**[E]**	**[F] = [D] – [E]**
10-Year	A	$5,754	$105	$5,649	$9,197	$449	$8,748
	B	$2,202	$0	$2,202	$3,534	$5	$3,529
	C	$3,895	$6	$3,889	$5,517	$38	$5,479
	D	$2,572	$208	$2,364	$4,177	$218	$3,959
	E	$155	$25	$130	$992	$348	$644
	Total	**$14,578**	**$344**	**$14,233**	**$23,417**	**$1,059**	**$22,359**
25-Year	A	$3,886	$622	$3,264	$4,321	$1,340	$2,981
	B	$1,018	$98	$920	$1,416	$278	$1,138
	C	$1,764	$5	$1,759	$2,211	$43	$2,168
	D	$1,292	$313	$980	$1,767	$204	$1,563
	E	$84	$43	$40	$397	$155	$242
	Total	**$8,043**	**$1,081**	**$6,963**	**$10,112**	**$2,019**	**$8,093**
Grand Total	A	$9,640	$727	$8,913	$13,518	$1,788	$11,729
	B	$3,219	$98	$3,121	$4,950	$283	$4,667
	C	$5,659	$11	$5,648	$7,728	$81	$7,647
	D	$3,864	$521	$3,343	$5,945	$422	$5,522
	E	$239	$69	$170	$1,389	$503	$886
	Total	**$22,621**	**$1,425**	**$21,196**	**$33,530**	**$3,077**	**$30,452**

6.4.2.6. Property Value Impacts

Numerous economic studies show that being in a flood zone lowers property values (McAlpine and Porter, 2018). Some studies have found that decreases in home prices were driven by the experiences of recent flooding events, with negative price impacts diminishing over time. Moreover, some studies found that being in a designated Special Flood Hazard Area had a greater effect on home prices near the coast than on home prices near water in interior regions (Johnston and Moeltner, 2018). To support analysis of impacts from the city's infrastructure investment on property values, ICF developed hedonic pricing models to estimate how the City of Naples' housing market reacts to potential flood risk.

When people consider a home to buy, they consider a multitude of characteristics that comes with that home. In addition to looking at the structure of the home, they also consider its location, its proximity to amenities and disamenities, the neighborhood culture, other personally important characteristics, and, in the case of the City of Naples, its likelihood of being flooded. The theory behind hedonic analysis is that after controlling for all factors that contribute to home prices, one can isolate how much people are willing to pay for a particular characteristic. Hedonic models are often used to estimate the effect of certain environmental attributes on home prices.

This analysis examines the negative impacts of flood risk on both condo and single-family home prices in the City of Naples. Similar to Johnston and Moeltner (2019), this analysis used elevation as a proxy for flood risk, as homes and roads at lower elevations are more prone to flooding than homes and roads at higher elevations. Given the frequency and severity of flooding in the City of Naples, as well as the media attention the flooding generates, home buyers are likely aware of the location of recent flooding events and factor this knowledge into their home purchasing decisions.

The hedonic analysis developed three models to evaluate the impacts of flooding on housing values, 1) a Condo Only model, 2) a Single-family Only model, and 3) an All-Sales model. The parameterization of the hedonic models, including detailed descriptions of the household and neighborhood characteristics and methods used to calibrate these models is located in ***Appendix C – Supporting Documentation***. The All-Sales model is the most appropriate when comparing to other City-wide impacts, as the model factors in all home types. Model results show that home buyers are willing to pay a premium for the additional flood protection benefits afforded by nearby roads with higher average elevations of home parcels. For example, homeowners would have a reduced risk of losing road access to amenities and necessities (e.g., beaches, hospitals) in an area with higher elevated roads. Based on the All-Sales model, a one-foot increase in the mean elevation of roads within a home's associated census tract results in a 0.77 percent increase in housing price. Similarly, a one-foot increase in mean parcel elevation results in a 0.02 percent increase in housing price.

For the damage assessment, only road elevation impacts were included in the overall damage estimates, as overlapping benefits may occur between the property elevation impacts and the residential property damages. As both property value impacts and property structural damage rely on a property's elevation, the former was excluded to ensure there was no double counting. The All-Sales road elevation coefficient from the hedonic model was solely used to determine the property value impacts from resilience investments. Because the hedonic analysis employed a log-linear model, a transformation was used to estimate the percentage change in property value for a one unit increase in the road elevation.10 To monetize the value impacts for each observation under each storm type and condition set, we multiplied the adjusted coefficient by the property value and the difference in elevation between the with and without investment scenarios. The result was the total property value impact due to a change in road elevation. To annualize this value and make it

[10] This calculation includes an exponential transformation on the coefficient, subtracting one from this value, and multiplying by 100. In the case of the road elevation coefficient this amounted to 0.769% = $(e^{0.766} - 1) / 100$.

compatible with calculating annual benefits to investment scenarios, we derived the annual rental-equivalents for each property value impact by multiplying the total value impacts by a discount rate of 3 percent (see ***Appendix C – Supporting Documentation*** for more information).

The estimated property value benefits of resilience investment under the existing conditions scenario are $4.5 million for the 10-Year storm, and $2.8 million for the 25-Year storm. Total property value benefits of resilience investment under the existing conditions scenario are estimated at $7.4 million over 50 years. For future conditions, property value impact benefits are estimated at $5.3 million for the 10-Year storm, and $2.0 million for the 25-Year storm. Total property value benefits of resilience investment under the future conditions scenario are estimated at $7.3 million over 50 years.

Table 6-9 shows these estimates by assessment area, condition set, storm type, and associated totals.

Table 6-9: 50 Year Total of Property Value Impacts for 10-Year and 25-Year Storms Under Existing and Future Conditions (2023 Dollars in Thousands)

Storm type	Assessment Area	EC Benefits	FC Benefits
10-Year	A	$2,520	$2,485
	B	$348	$471
	C	$1,493	$2,018
	D	$161	$290
	E	$-	$-
	Total	**$4,522**	**$5,263**
25-Year	A	$1,618	$764
	B	$202	$198
	C	$865	$854
	D	$144	$219
	E	$-	$-
	Total	**$2,829**	**$2,036**
Grand Total	A	$4,139	$3,249
	B	$549	$669
	C	$2,358	$2,873
	D	$305	$508
	E	$-	$-
	Total	**$7,351**	**$7,299**

6.4.2.7. Property Tax Impacts

The flood resilience investments that result in increased property values are expected to result in relative increases in property value (or the preservation of property values that would otherwise be in decline in the absence of resilience investments). These changes in property values will result in changes to property tax revenues. To estimate changes in property tax revenues, this analysis took the results of the annual property value impacts, including the effects of both property elevation and road elevation, and multiplied them by local tax rates.

We used Collier County millage rates from 2022 and assumed those rates remained constant over the 50-year analysis period from 2040 to 2090.[11] We multiplied these tax rates by the undiscounted property value impacts for each property and year as well as for each storm type and condition set. Property value impacts include the dollar impacts of both road elevation (described above) and property elevation (described further in ***Appendix C – Supporting Documentation***) to provide the full scope of a change in elevation, or decreased potential for flooding with resilience investments, impacts on a property's value and therefore the tax revenue resulting from property taxes.

Similar to property value impacts, tax revenue impacts are presented as the difference between flood conditions with and without resilience investments because they capture the impact of an additional foot of elevation. These incremental impacts represent the differential between investment and no investment scenarios, which captures the impact on tax revenue. For the existing conditions scenario, the tax revenue benefits resulting from resilience investments impacts on property values are estimated at $1.7 million for the 10-Year storm, and $1.1 million for the 25-Year storm. **Total tax revenue impacts for the existing conditions scenario are estimated at $2.8 million over 50 years**. For future conditions, with resilience investments, tax revenue benefits are estimated at $2.0 million for the 10-Year storm, and $0.8 million for the 25-Year storm. **Total tax revenue impacts for the future conditions scenario are estimated at $2.8 million over 50 years**.

Table 6-10 shows these figures by assessment area, condition set, storm type, and associated totals.

Table 6-10 50 Year Total of Tax Revenue Impacts for 10-Year and 25-Year Storms Under Existing and Future Conditions (2023 Dollars in Thousands)

Storm type	Assessment Area	Existing Conditions	Future Conditions
10 Year	A	$923	$920
	B	$126	$172
	C	$577	$777
	D	$57	$102
	E	$0	$1
	Total	**$1,684**	**$1,972**
25 Year	A	$614	$314
	B	$73	$74
	C	$348	$357
	D	$52	$77
	E	$0	$1
	Total	**$1,087**	**$823**
Grand Total	A	$1,538	$1,234
	B	$199	$246
	C	$925	$1,134
	D	$109	$179
	E	$0	$2
	Total	**$2,770**	**$2,795**

Note: Zero dollar values indicate values less than $1,000 and are non-zero.

[11] A millage rate is the total tax due per $1,000 of assessed property value. This analysis included all assessments in the total millage rate, including for schools and other items.

6.4.2.8. Summary Results

The above sections highlight the methods and results of the five impact categories assessed as part of this analysis. The per-storm avoided damages are based on the difference between damages associated with a no-improvement scenario and a n improvement scenario (in both existing and future conditions). **Table 6-11** below shows the per-storm damages for each assessment area for these scenarios.

Table 6-11 Per Storm Total Across Property Damages, Commercial Business Disruption, and Roadway Damages for 10-Year and 25-Year Storms Under Existing and Future Conditions, (2023 Dollars in Thousands)

Storm Type	Assessment Area	Existing Conditions Baseline Damages	Selected Improvement Alternatives Damages	Damages Avoided	Future Conditions Baseline Damages	Long-Range Resilient Alternatives Damages	Damages Avoided
10-Year	A	$16,602	$14,829	$1,773	$18,308	$14,897	$3,411
	B	$1,674	$-	$1,674	$13,173	$1	$13,172
	C	$2,073	$1	$2,072	$15,708	$7	$15,700
	D	$660	$41	$619	$6,971	$43	$6,928
	E	$35	$6	$30	$2,126	$70	$2,056
	Total	**$21,044**	**$14,876**	**$6,168**	**$56,286**	**$15,019**	**$41,267**
25-Year	A	$18,151	$15,575	$2,576	$19,707	$15,810	$3,897
	B	$3,000	$268	$2,732	$13,720	$356	$13,365
	C	$9,820	$6	$9,815	$16,219	$574	$15,645
	D	$805	$153	$652	$7,019	$101	$6,918
	E	$47	$23	$24	$2,126	$79	$2,047
	Total	**$31,823**	**$16,025**	**$15,799**	**$58,792**	**$16,920**	**$41,872**

Note that the table above does not show the damages over 50 years, as the total damages of the projects are probabilistic in nature. Therefore damage estimates over the course of 50 years were found by multiplying the risk rate for a given year that a flood would occur by the per-storm event damages.

The total benefits of resilience investments are the sum of the difference in damages between with-investment and without-investment cases across residential property damages, commercial damages, roadway damages, and property value impacts. A summary of these results is presented in **Table 6-12** below.

- Avoided property damages comprise the largest component of total benefits for the existing conditions scenarios at **$27.9 million (36 percent)** and the second largest component of total benefits for the future conditions scenario at **$104.5 million (32 percent)**.
- Avoided commercial business disruptions with a 90-day post-flood closure period comprise the second largest component of total benefits for the existing conditions scenario at **$17.4 million (23 percent)** and the largest component of total benefits for the future conditions scenario at **$186 million (56 percent)**.

- Avoided roadway damages represent the third largest component of the total benefits at **$21.2 million (28 percent) and $30.5 million (9 percent)** for both existing and future conditions scenarios, respectively.
- Estimated increases in property values ($7.4 million and $7.3 million) are more muted compared to avoided property and roadway damage.

In general, benefits under the future conditions are higher than existing conditions due to the larger intensity of storms expected in the future. Larger intensity storms result in more flooding, and therefore the impacts of the proposed resilience investments in protecting property, infrastructure, and businesses are greater.

The estimated benefits are not evenly distributed across the assessment areas, because of their characteristics. The benefits are the greatest in Assessment Area C, followed in decreasing order by Areas B, D, A, and E for future conditions and Area C, A, B, D, and E for existing conditions. Assessment Area C's larger benefits result from a higher density of homes within the study area and generally higher residential property values (and therefore more avoided residential property damages). **Table 6-12** presents the total benefits.

See ***Appendix C – Supporting Documentation*** for results on a per-storm basis.

Table 6-12: 50 Year Total Benefits for 10-Year and 25-Year Storms Under Existing and Future Conditions (2023 Dollars in Thousands)

Storm Type	Assessment Area	Existing Conditions	Future Conditions
10-Year	A	$11,563	$20,653
	B	$9,276	$73,391
	C	$12,059	$88,080
	D	$3,320	$41,118
	E	$151	$10,486
	Total	**$36,369**	**$233,728**
25-Year	A	$6,873	$8,919
	B	$6,008	$29,886
	C	$23,086	$35,297
	D	$1,475	$16,531
	E	$49	$4,176
	Total	**$37,491**	**$94,809**
Grand Total	A	$18,436	$29,571
	B	$15,284	$103,277
	C	$35,146	$123,377
	D	$4,794	$57,649
	E	$199	$14,662
	Total	**$73,860**	**$328,536**

Note: Total benefits do not include the property tax revenue impacts because such benefits are a transfer from property owners to local government. Such payments are treated as transfers because they do not increase or decrease the total economic value of the assets analyzed.

As noted in the introduction, the City of Naples will be subject to damage from other types of storms, not exclusively the 10-year and 25-year floods. Such storms could include a 50-year flood, a 100-year flood, or other tropical storms and hurricanes. Kimley-Horn and ICF did not model the flood inundation or economic impacts associated with these storms in this report. **Therefore, the results in**

this analysis are a very conservative estimate of the benefits the City of Naples could expect by making flood resilience investments.

6.4.3.Benefit-Cost Comparison

The calculated cost and benefits were compared for existing and future conditions. See ***Table 6-13*** and ***Table 6-14*** below for calculated benefit/cost ratios for all improvements within each Assessment area for current and future conditions, respectively.

Table 6-13 Benefit/Cost Ratio for Selected Improvement Alternatives

Assessment Area	Benefit Associated with Improvement Alternative	Improvement Alternative Cost	Benefit/Cost Ratio
A	$18,436	$19,900	0.93
B	$15,284	$49,900	0.31
C	$35,146	$85,100	0.41
D	$4,794	$32,800	0.15
E	$199	$900	0.22
Total	**$73,860**	$188,600	0.39

Table 6-14 Benefit/Cost Ratio for Long-Range Alternatives in Future Conditions

Assessment Area	Benefit Associated with Improvement Alternative	Improvement Alternative Cost	Benefit/Cost Ratio
A	$29,571	$117,400	0.25
B	$103,277	$107,700	0.96
C	$123,377	$129,000	0.96
D	$57,649	$89,300	0.65
E	$14,662	$85,800	0.17
Total	**$328,536**	$529,200	0.62

Please note that the costs and benefits provided in this section are both very conservative and very broad estimates. Cost values include several assumptions designed to provide a conservatively high estimate of potential project costs. This includes conservative assumptions for miscellaneous costs associated with the project, the assumption that the City will pay for all seawall costs on private property, a 20% contingency for the overall project cost, and additional contingencies for proposed pump costs. It is recommended that additional cost estimates be performed for specific improvements. Additionally, because of the information available, the benefit values provide a conservatively low estimate of potential benefit. The benefit value does not include avoided damages or benefits from storm events that were not modeled, such as a 50-year, or 100-year storm, as well as minor storm events. Additionally, the estimated benefits are in 2023 dollars and do not account for inflation over the course of the measured benefit lifespan. Costs are also in 2023 dollars and do not account for increases in cost over time if these improvements are constructed at a later date.

Based on the benefit-cost comparison, the project costs are higher than the estimated benefits for all Assessment Areas. However, in future conditions, the benefit of the proposed project generally increases as the modeled flooding improvement worsens in a do-nothing scenario. In Assessment Areas B, C, and D, the cost-benefit ratios are close to 1-to-1 in future conditions. Areas A and E have a lower benefit-cost ratio than the other alternatives due to less estimated damages and proposed improvements that are aimed at addressing future conditions versus existing concerns. Note that the benefit-cost comparison only factors the monetary costs and benefits associated with the proposed improvements based on the analyses above and does not intend to weigh options.

7. Capital Improvement Plan Recommendations

Based on the existing condition analysis, alternatives analysis, and future condition analysis, final improvements were selected. For those selected improvements, costs and benefits were calculated. Additionally, because both existing and future conditions were considered, conclusions could be drawn regarding which elements of the proposed improvements should be implemented in the short-term, medium-term, and long-term.

Alternatives were considered in the existing condition and in the long-range planning horizon which was 50 years plus an additional 20-years for implementation. Because these were the only two timeframes modeled, when making recommendations regarding phasing, the portions of the project improvement alternatives in the existing conditions that were most vulnerable (i.e. had the most flooding currently) were identified as the short-term projects. The remaining improvements in the existing condition improvement alternatives were noted as medium-term projects. The long-range modeled alternatives were identified as the long-term projects. No specific timeframes were assigned beyond this.

The below sections include a general narrative describing the Final Selected Alternative and associated short, medium, and long-term recommendations. Additionally, based on the Selected Alternatives, funding opportunities were considered and are included in this section of the report. The attached exhibits show the CIP recommendations for each Assessment Area in the short-, medium-, and long-term.

7.1. Assessment Area A Recommended Improvements

The final selected improvement, Alternative 1A, focused on upsizing and adding pipes in existing conditions and adding pump stations in future conditions. This included upsizing existing pipe infrastructure, proposing new infrastructure connections, and adding pump stations at Devils Lake, Swan Lake, and along Crayton Rd in future conditions. The Selected Improvement Alternative for Assessment Area A is found in the ***Improvement Alternatives Exhibit Section***, while the Selected Long-Range Resilient Alternative is found in ***Long-Range Resilient Alternatives Exhibit Section***.

The short-term recommended improvements focus on projects at the western side of the Assessment Area, where flooding is more severe in existing conditions. These projects are downstream of Devils Lake and Swan Lake, meaning that improvements can be made without evaluating or changing lake operations. The medium-term recommended improvements include projects that are upstream of the existing lakes. It is recommended that drainage improvements upstream of the Lakes include additional analysis to evaluate water quality concerns and feasibility of discharging additional water from the Lakes from changes in control structure operating procedure. The long-term recommendations include projects that will be more vulnerable to sea-level rise at the western end of the Assessment Area, as these areas discharge directly to Venetian Bay. See ***CIP Phasing Maps Exhibit Section*** for an exhibit of which proposed improvements are recommended in the short, medium, and long term for this Assessment Area.

7.1.1.Short-Term Recommendations:

Based on the findings of this assessment, the following items are recommended for Assessment Area A in the short-term:

- Short-term projects are recommended to focus on areas downstream of lakes.
- Pipe sizes from residential areas east of Crayton Road, including pipes within Crayton Road, are recommended to be upsized. Additional connections at and along Crayton Road are recommended as well.
- Due to space constraints within existing easements, it is recommended that upsized pipes do not exceed 48”. The exception to this is in areas that outfall from Devils Lake or Swan Lake, as these areas may require additional capacity.
- Individual analyses of proposed pipe systems are recommended.
- Diverting water that has traditionally drained to Swan Lake and Devils Lake is not recommended due to water quality concerns of directly discharging runoff that is currently treated.

7.1.2.Medium-Term Recommendations:

Based on the findings of this assessment, the following items are recommended for Assessment Area A in the medium-term:

- Medium-term projects are recommended to focus on areas upstream of lakes.
- Pipes that discharge directly to Devils Lake along West Boulevard, Neapolitan Way, Whispering Pipe Way, and Crayton Road are recommended to be upsized. Additional connections along and from West Boulevard are recommended.
- It is recommended that an evaluation of control structure operation and lake water quality accompany any changes that are proposed to infrastructure flowing into the lakes. .
- Pipes that discharge directly to Swan Lake along Turtle Hatch Road, Willowhead Way, Willowhead Drive, Belair Lane, and Old Trail Way are recommended to be upsized. Additional connections from West Boulevard, Belair Lane, and Old Trail Drive are recommended.

7.1.3.Long-Term Recommendations:

Based on the findings of this assessment, the following items are recommended for Assessment Area A in the long-term:

- Long-term projects are recommended to focus on resiliency to sea-level rise. Areas that are most vulnerable to sea level rise are those that directly discharge to Venetian Bay.
- Five pump stations (Pumps A1, A2, A3, A4, and A5) are proposed along Crayton Road, two of which will serve Devils and Swan Lake.
- Gravity connections to pump stations along Crayton Road are recommended to be added as needed, with pipes being plugged to prevent backflow as necessary.
- Pump station location, pump specifications, operation procedures, and outfall mechanism are recommended to be evaluated in detail.

7.2. Assessment Area B Recommended Alternative

The final selected improvement, Alternative 2B, focused on proposing three new pump stations that will serve as outfalls for the Assessment Area. This included upsizing the existing pipe infrastructure and adding connections to the proposed pumps, eliminating the pipe connections to the Cove Pump Station, and adding additional pumps and seawalls in future conditions. The Selected Improvement Alternative for Assessment Area B is found in the ***Improvement Alternatives Exhibit Section*** while the selected Long-Range Resilient Alternative is found in the ***Long-Range Resilient Alternatives Exhibit Section***.

The short-term recommended improvements will focus on projects that will divert stormwater from Cove Pump Station to new outfalls within the Assessment Area and evaluate upsizing the Cove Pump Station. The medium-term recommendations will include projects focusing on secondary drainage improvements to improve localized flooding concerns. Additional improvements outside the Assessment Area will further divert water from the Cove Pump Station, which will benefit Assessment Area B based on the model results. Long-term recommendations are to propose seawalls in low-lying areas that connect to Naples Bay, additional pump stations, and diverting any remaining gravity flow to new pump stations. See ***CIP Phasing Maps Exhibit Section*** for an exhibit of which proposed improvements are recommended in the short, medium, and long term for this Assessment Area.

7.2.1. Short-Term Recommendations

Based on the findings of this assessment, the following items are recommended for Assessment Area B in the short-term:

- Short-term projects are recommended to focus on diverting flows from Cove Pump Station to new outfalls within the Assessment Area.
- Stormwater pump (Pump B2) at 6th Ave S and infrastructure at 6th Ave S are recommended to be upsized and disconnected from the trunkline going to the Cove Pump Station. A connection from 7th Ave S to the pump station is recommended.
- Stormwater pump (Pump B1) at 10th St S is recommended. It is recommended that the upstream upstream infrastructure is upsized and disconnected from the trunkline going to the Cove Pump Station. Additional connections to 10th Ave S and 8th Ave S are recommended.
- Pump station location, pump specifications, operation procedures, and outfall mechanism are recommended to be evaluated in detail.
- Check valves are recommended to be added at all remaining gravity outfalls to Naples Bay. Check valves are recommended to prevent inflow from Naples Bay into the system that will now be served by a pump.
- The Cove Pump Station is recommended to be upsized.

7.2.2. Medium-Term Recommendations

Based on the findings of this assessment, the following items are recommended for Assessment Area B in the medium-term:

- Medium-term projects are recommended to include additional secondary drainage improvements and offsite improvements.
- The existing infrastructure connecting 6th Ave S to Pump B2 and associated connections are recommended to be upsized.

- The existing infrastructure along 8th Ave S are recommended to be upsized and disconnected to 8th St S. It is recommended that additional connections to Pump B1 be evaluated.
- Local infrastructure at commercial development is recommended to be evaluated and connected to a pump station if needed.
- Infrastructure along 7th Ave S and 11th St is recommended to be upsized. It is recommended that connections to 8th St S that discharge to the Cove Pump Station be eliminated.
- It is recommended that any additional proposed discharge to Naples Bay maximize connections through easements and public right-of-way. Existing pipe connections where upsizing is not possible due to physical constraints or ownership obstacles may be plugged as needed and new outfalls proposed.

7.2.3.Long-Term Recommendations

Based on the findings of this assessment, the following items are recommended for Assessment Area B in the long-term:

- Additional pump stations (Pumps B3 and B4) along Naples Bay are recommended.
- Remaining gravity outfalls are recommended to be connected to proposed pump stations.
- It is recommended that additional seawalls be constructed or existing seawalls be raised along the eastern side of the Assessment Area bordering the Bay.
- It is recommended that an additional analysis be performed at 5th Ave S to divert water from this road away from the Assessment Area.

7.3. Assessment Area C Recommended Alternative

The final selected improvement, Alternative 2C, focused on proposing two new pump stations that will each serve the western and eastern halves of the Assessment Area. This included upsizing the existing pipe infrastructure and adding connections to the proposed pumps, eliminating the pipe connections to the Cove Pump Station, and adding an additional pump and seawalls in future conditions. The Selected Improvement Alternative for Assessment Area C is found in the ***Improvement Alternatives Exhibit Section*** while the selected Long-Range Resilient Alternative is found in the ***Long-Range Resilient Alternatives Exhibit Section.***

The short-term recommended improvements include two proposed pump stations and the infrastructure that will divert runoff to the proposed pump stations. This will include eliminating existing connections from the Assessment Area to the Cove Pump Station. The medium-term recommended improvements will focus on upsizing the remaining infrastructure that is connected to the proposed pump stations to improve local flooding conditions. Long-term recommendations are to add seawalls along low-lying areas that border the Naples Bay or Crayton Cove, add additional pump stations to areas that are still being served by gravity flow, and eliminate any remaining gravity connections to the outfall waterbodies. See ***CIP Phasing Maps Exhibit Section*** for an exhibit of which proposed improvements are recommended in the short, medium, and long term for this Assessment Area.

7.3.1.Short-Term Recommendations

Based on the findings of this assessment, the following items are recommended for Assessment Area C in the short-term:

- Short-projects are recommended to focus on proposing and diverting runoff to stormwater pump stations.
- It is recommended that each of the distinct drainage areas has its own master stormwater pump stations (Pump C1 and C2) that will serve the entirety of the drainage area. Pump C1 is proposed to be located at 3rd St S, while Pump C2 is proposed at 12th Ave S.
- It is recommended that the drainage area previously drained to the Cove Pump Station be rerouted to Pump C2. Connections from the Assessment Area to Broad Ave are recommended to be plugged and eliminated.
- The infrastructure upstream of the proposed pumps is recommended to be upsized. Additional connections are proposed along 12th Ave S and 5th St S to divert existing infrastructure to Pump C2. Additional connections to Gordon Drive are recommended to Pump C1.
- It is not recommended that infrastructure along Broad Avenue be upsized, as the existing infrastructure in this area is already very large and deep. Existing flooding in this area can be improved by rerouting pipes to new pump stations or gravity outfalls, which will reduce the total inflow to the Cove Pump Station.
- It is recommended that the Cove Pump Station be upsized. Pump station location, pump specifications, operation procedures, and outfall mechanism are recommended to be evaluated in detail.

7.3.2.Medium-Term Recommendations

Based on the findings of this assessment, the following items are recommended for Assessment Area C in the medium-term:

- Medium-term projects are recommended to focus on upsizing infrastructure upstream of pump stations to improve local flooding conditions.
- Infrastructrure throughout the residential area along 13th Ave S and 14th Ave S is recommended to be upsized and connected to Pump C1 to reduce modeled flooding.
- The infrastructure connection from 3rd St S to proposed Pump C1 is recommended to be upsized.
- Existing connections to improved infrastructure draining to Pump C2 are recommended to be upsized to reduce modeled flooding.
- New connections from 14th Ave S to improved infrastructure at 13th Ave are recommended to connect this area with Pump C1. It is recommended that check valves be added at all remaining gravity outfalls to Naples Bay and Crayton Cove. Check valves are recommended to prevent inflow from Naples Bay and Crayton Cove into the system that will now be served by a pump.

7.3.3.Long-Term Recommendations

Based on the findings of this assessment, the following items are recommended for Assessment Area C in the long-term:

- Pump Station C4 is recommended at 14th Ave S to serve remaining gravity flows from 14th Ave S to the canal leading into Crayton Cove. Additional connections from 14th Ave S to the pump are proposed and existing connections are recommended to be plugged and eliminated.
- Seawalls are recommended throughout the Assessment Area in future conditions to prevent backflow from the outfall waterbodies into the stormwater pump stations.

7.4. Assessment Area D Recommended Alternative

The final selected improvement, Alternative 3D, focused on rerouting infrastructure from the Public Works Pump to improved gravity outfalls and converting those outfalls to pump stations in future conditions. This includes plugging and eliminating pipes from 10th St N to the Public Works Pump as well as upsizing infrastructure along 5th Ave N, 10th St N, and Central Ave to improved outfalls at Goodlette Frank Rd. The Public Works Pump is proposed to be upsized, and new pumps are recommended at the improved gravity outfalls in future conditions. The Selected Improvement Alternative for Assessment Area D is found in the ***Improvement Alternatives Exhibit Section*** while the selected Long-Range Resilient Alternative is found in the ***Long-Range Resilient Alternatives Exhibit Section***.

The short-term recommended improvements will focus on locations of the greatest existing conditions flooding hazard. It is also recommended that in the short-term, the Public Works Pump is upsized. Modeled Improvement to Public Works Pump Capacity demonstrated flood improvement along Goodlette-Frank Rd and within the Assessment Area, even if no other improvements were modeled for the FPL system. Medium-term recommended improvement will focus on improvements that will divert storm infrastructure from the Public Works Pump to the other outfalls that will have additional capacity based on the recommended short-term recommended improvements. Long-term improvements will focus on converting existing gravity flow to pump flow and eliminating overland connection to the Gordon River by offsite seawalls or raising elevations within portions of various rights-of-way. See ***CIP Phasing Maps Exhibit Section*** for an exhibit of which proposed improvements are recommended in the short, medium, and long term for this Assessment Area.

7.4.1. Short-Term Recommendations

Based on the findings of this assessment, the following items are recommended for Assessment Area D in the short-term:

- Short-term improvements are recommended to focus on areas of the greatest flooding hazard.
- The Public Works Pump is recommended to be upsized, as the modeling indicates that this pump may be undersized. It is also recommended that the pipes directly upstream an downstream of the pump station be evaluated in detail. Pump station location, pump specifications, operation procedures, and outfall mechanism are recommended to be evaluated in detail.
- Additional infrastructure and upsizing of current infrastructure at the intersection of Goodlette-Frank Rd S and Central Ave is recommended to improve flooding at this location.
- It is recommended that the existing infrastructure at Central be plugged and disconnected from the Public Works Pump to fully utilize proposed improvements and provide flow relief at the Public Works Pump.
- It is recommended that infrastructure along 5th Avenue be upsized, including existing outfall at Goodlette Frank Rd.
- Pump station location, pump specifications, operation procedures, and outfall mechanism are recommended to be evaluated in detail.

7.4.2. Medium-Term Recommendations

Based on the findings of this assessment, the following items are recommended for Assessment Area D in the medium-term:

- Medium-term projects are recommended to focus on improvements to divert storm infrastructure from Public Works Pump to other outfalls.
- Infrastructure along 10th St N is recommended to be upsized. Additional connections from upsized infrastructure to improved outfalls are recommended. It is recommended that the connection from 10th St N to the FPL system be eliminated.
- Infrastructure at existing 5th Ave outfall along Goodlette-Frank Rd is recommended to be upsized. This will provide additional gravity outfall for areas of 10th St N that are recommended to be routed to this system in medium-term conditions.
- Upsized infrastructure along 10th St N and Central Ave is recommended to address existing flooding. Additionally, it is recommended that a connection to the Central Ave improvements be added and the connection to FPL site and Public Works Pump be plugged and eliminated.
- Road raising or sea walls are recommended to be evaluated when infrastructure improvement occurs to prevent future overland flow from the River due to sea level rise.

7.4.3.Long-Term Recommendations

Based on the findings of this assessment, the following items are recommended for Assessment Area D in the long-term:

- All three existing gravity outfalls from Assessment Area D are recommended to be converted to stormwater pump stations (Pumps D1, D2, and D3) in future conditions.
- It is recommended that road and shoulder elevations be raised to eliminate overland flow lower than 4.4'. Alternatively, these overland connections could be eliminated through offsite seawalls. Both these options should be evaluated further.

7.5. Assessment Area E Recommended Alternative

The final selected improvement, Alternative 1E, focused on upsizing existing infrastructure in existing conditions and adding stormwater pump stations in future conditions. This included upsizing the existing pipes at 5th Ave N, 13th St N, and 14th St N that outfall to the Gordon River, as well as adding multiple pump stations along North Rd and 5th Ave N and adding pipe connections to those pump stations in future conditions, as well as adding seawalls. The Selected Improvement Alternative for Assessment Area E is found in the ***Improvement Alternatives Exhibit Section*** while the selected Long-Range Resilient Alternative is found in the ***Long-Range Resilient Alternatives Exhibit Section***.

The short-term recommended improvements will focus on upsizing existing infrastructure along 5th Ave N and the nearby 15th St N and 14th St N. The medium-term recommended improvements will focus on upsizing the existing outfall structure at Airway Drive. In the long-term scenario, it is recommended that existing gravity pipes will be converted to pumped flow and seawalls be proposed throughout the Assessment Area to eliminate overland connection from the Gordon River. See ***CIP Phasing Maps Exhibit Section*** for an exhibit of which proposed improvements are recommended in the short, medium, and long term for this Assessment Area.

7.5.1.Short-Term Recommendations

Based on the findings of this assessment, the following items are recommended for Assessment Area E in the short-term:

- It is recommended that existing infrastructure along 5th Ave N and the nearby 13th St N and 14th St N be upsized.

- It is not recommended that new infrastructure connections to Assessment Area D be evaluated. This is due to creating worsened flooding in future conditions unless very specific phasing procedures are implemented.

7.5.2.Medium-Term Recommendations

Based on the findings of this assessment, the following items are recommended for Assessment Area E in the medium-term:

- It is recommended that the outfall structure at existing Airway Drive stormwater management area be upsized.

7.5.3.Long-Term Recommendations

Based on the findings of this assessment, the following items are recommended for Assessment Area E in the long-term:

- Proposed pump stations (Pump E1 and Pump E2) along 5th Ave N at eastern and western side of the Assessment Area are recommended. Stormwater infrastructure is recommended to connect to the proposed pump stations, with remaining gravity connections plugged to prevent inflow from the Gordon River to the pump station. It is recommended that seawalls be proposed at the back of residential lots and areas of park be raised to prevent inflow from the River to residential areas.
- It is recommended to replace remaining gravity outfalls along North Road and connected residential areas with pump stations (Pumps E4-E7) in future conditions. The raising of overland connections should be evaluated at this time.

7.6. Funding Opportunities

Certain issues were taken into consideration in developing the list of potential grant funding sources for the City of Naples. For the purposes of identifying realizable funding opportunities, general stormwater programs that could fund certain aspects of the proposed improvements are listed. However, in order to find more specific suitable funding mechanisms, it is recommended that individual projects be identified within the five (5) assessed areas based on the City's priorities and construction phasing decisions. Identified projects should be added to the Collier County Local Mitigation Strategy project list for projects to be eligible for non-emergency disaster assistance, including funding for mitigation projects for natural hazards.There are various stormwater programs that fund distinct aspects of projects and there might be two funding programs that may fit one specific project. Listed are the initial general funding opportunities the City might want to explore:

Federal Emergency Management Agency (FEMA) - Flood Mitigation Assistance Grant Program
This program supports communities' efforts in mitigating flood events. Projects funded under this grant program include addition of greenspace, water control systems, such as channels or berms or other flood prevention projects which reduce flooding impacts to communities. This is a competitive annual grant program that opens up every Summer. The program does place an emphasis on cost-effectiveness of the project and requires a City co-share.

Federal Clean Water Program – Section 319
This program awards funds to projects that address nonpoint source pollution. The program funds

such activities as installing bioswales, green stormwater infrastructure, pervious pavement and plantings for bank stabilization. This program also funds educational related activities correlated to nonpoint source pollution and other water quality improvement demonstration projects. The program accepts proposals on a rolling basis and does require a City co-share.

State Water-Quality Assistance Grant Program
This program funds implementation of best management practices designed to reduce pollutant loads to waters not meeting water quality standards from urban stormwater discharges. It funds green stormwater infrastructure with the goals to reduce nonpoint source pollution from land use activities. The program accepts proposals on a rolling basis and City co-share is not required but encouraged.

Resilient Florida Grant Program – Implementation
As the City of Naples was awarded funds by the Resilient Florida Planning Grant Program in the program's Fiscal Year 2021-2022 to prepare a vulnerability assessment and adaptation plan, this places the City in a good position to apply for funding under this Program for implementation of flood control and sea level rise projects that relate to stormwater improvements, such as upsizing of pipes, adding pump stations and other projects related to sea level rise. Program grant cycle opens in July and does not require a City co-share.

7.7. Final Recommendations

This study was planning level in nature and focused on identifying areas vulnerable to flooding and then proposing potential solutions to address those vulnerabilities. These solutions included upsizing existing stormwater infrastructure, adding new infrastructure, and modifying or rerouting the existing connectivity of the stormwater network. These proposed solutions were not intended to be to at design level, but instead were modeled to understand what type of projects in what locations would be most effective. Because of this, as projects are implemented, it is recommended that the proposed projects be evaluated early in the design process to understand their individual effectiveness and determine if they would be eligible for grant funding. Once this is determined, it is also recommended that these projects are analyzed individually for the purposes of design and permitting.

The study assumes that all solutions were implemented together. Alternatives were modeled to identify solutions in existing conditions and future conditions. The existing condition alternatives were then recommended to be implemented in the short- and medium-term. The future condition alternatives were recommended to be implemented in the long-term. With this approach, short- and medium-term projects were not modeled separately. Detailed recommendations based on a year-by-year approach were also not identified. Additionally, individual projects were not modeled. It is recommended the City use the information in this study as a starting point to create a more detailed implementation plan. The implementation plan may need to include preliminary design phases to ensure the effectiveness of each project.

This study utilizes a very general and conservative cost estimate for all improvements in each Assessment Area. Similarly, the anticipated benefits are conservative in nature and measure the benefit of all modeled improvements in each Assessment Area. As a result, the potential benefits and costs for each project should be evaluated individually. Additionally, grant funding opportunities were identified for the overall project types and not specific improvements. While this study and associated modeling may be used for planning, it is recommended that projects be evaluated individually to identify specific funding opportunities.

The study was based on best-available topographic, landuse, and structural data. Survey was obtained for the purposes of this study. However, it is recommended that the available survey data be reviewed for each potential project and supplemental survey be obtained as needed. Additionally, it is recommended that project-specific geotechnical evaluation be performed as needed.

The proposed pump stations and improvements to current pump stations were modeled using general flow rates that would demonstrate modeled flooding improvement. The study did not evaluate pump station specifications, operating procedures, outfall mechanism, power requirements, specify an exact pump station location, or assess landscaping feasibility for proposed pump stations. As a result, it is recommended that new and improved pump stations be evaluated individually and in greater detail. Pump stations were identified as an effective solution in both the short-term and long-term. Because of this, it is recommended that the City consider feasibility studies of the proposed improvements to the Cove and Public Works Pump Stations, as well as feasibility studies for proposed pump stations identified as short-term improvements.

The identified seawall locations represent general places where seawalls were deemed necessary due to low-lying areas and the rising sea levels in future conditions and not exact locations for proposed seawalls. Detailed structural and cost analysis for proposed seawalls was not performed as a part of this study. Additionally, an assessment of existing seawall elevations, sea wall ownership, and sea wall structural integrity were not performed in this study. Because a specific elevation was selected for this study's future tailwater, modeled sea walls were set to an elevation that was higher than this future tailwater. No additional analyses or research was conducted to determine if this is a recommended sea wall elevation for the City. It is recommended that the City conduct a project specific to proposed sea walls to determine an approach for incorporating seawalls. Additionally, the proposed costs included the total cost of the sea walls proposed in this study. This is conservative in nature as it is more likely that a portion of this cost would be paid for by private owners. It is therefore also recommended that the City evaluate cost-sharing opportunities for seawall projects located on private property that would have a City-wide benefit in future conditions.

EXHIBITS

Kimley»Horn

Existing Conditions

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition.
2. Existing pipe sizes (ft) are labeled in gray.

Legend

- Nodes
- Existing Pipes
- Basins
- Assessment Area
- Existing Conditions Baseline 10YR Floodplains

No.	REVISIONS	DATE	BY

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KHA PROJECT 048320007
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PREPARED FOR
CITY OF NAPLES

CITY OF NAPLES FLORIDA

AREA A
EXISTING CONDITIONS
BASELINE
10 YEAR MODEL RESULTS

EXHIBIT
01-A-10

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition.
2. Existing pipe sizes (ft) are labeled in gray.

Legend

- Nodes
- Existing Pipes
- Basins
- Assessment Area
- Existing Conditions Baseline 25YR Floodplains

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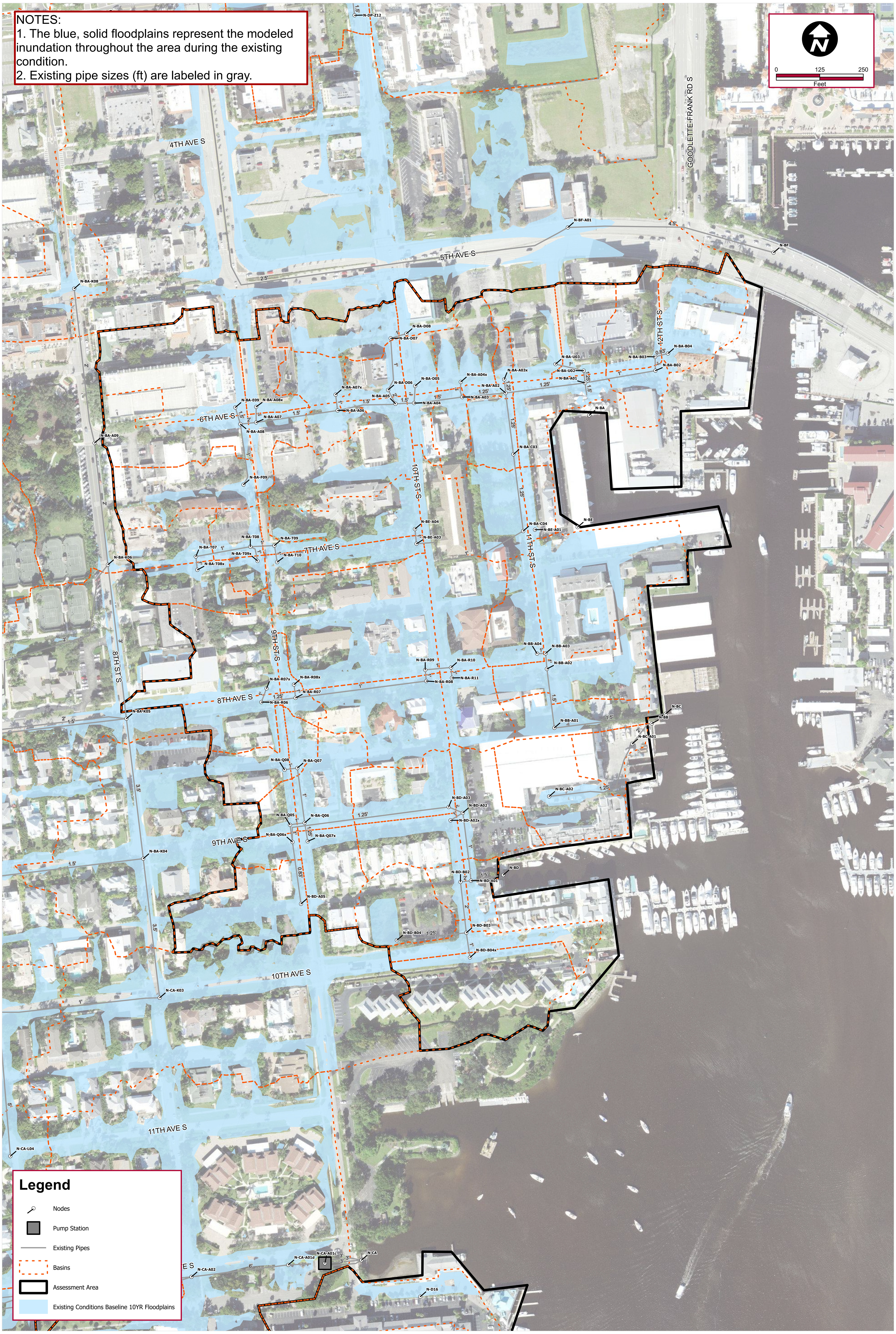
CITY OF NAPLES FLORIDA

AREA A
EXISTING CONDITIONS
BASELINE
25YR MODEL RESULTS

EXHIBIT
01-A-25

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition.
2. Existing pipe sizes (ft) are labeled in gray.



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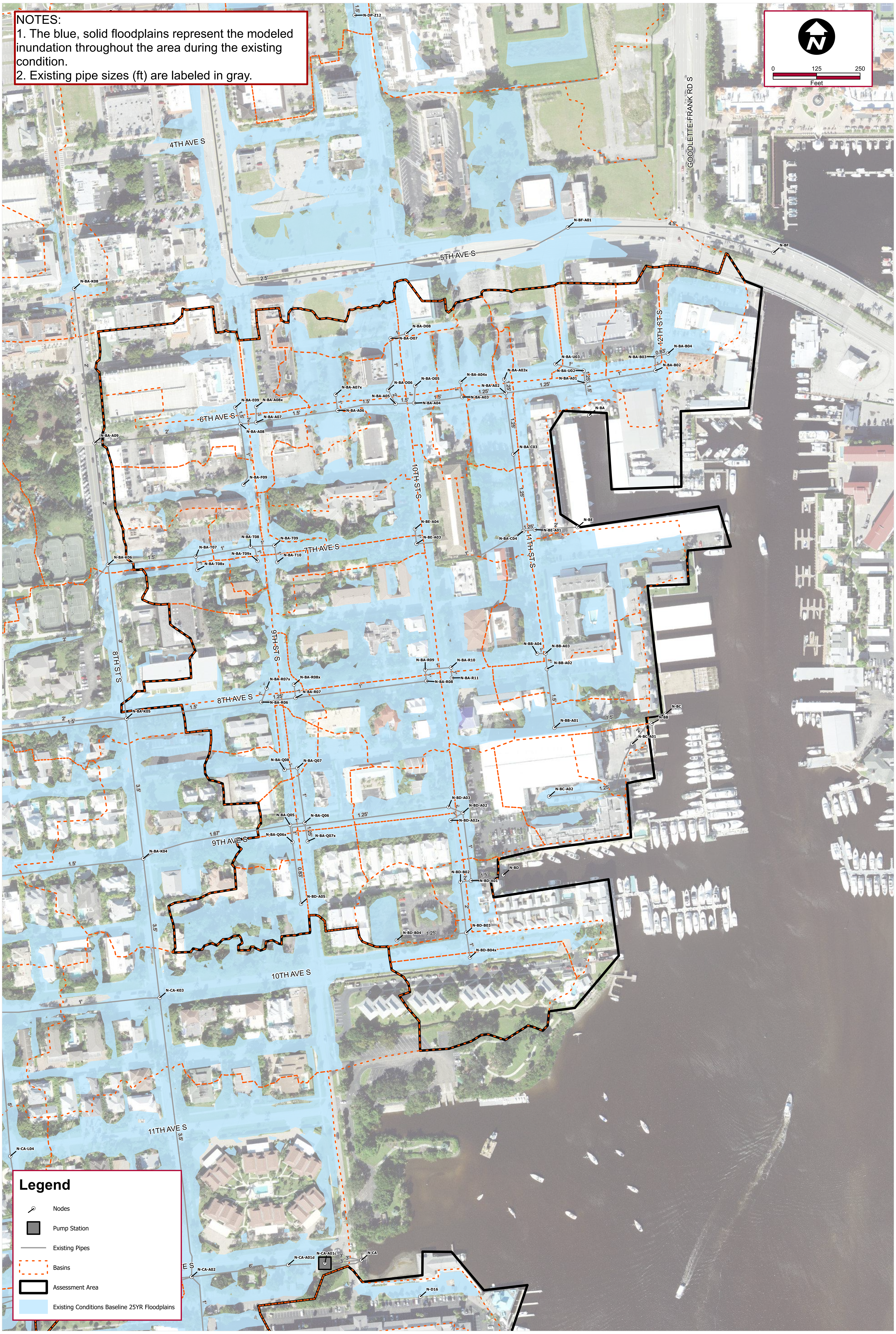
AREA B
EXISTING CONDITIONS
BASELINE
10YR MODEL RESULTS

FIGURE
01-B-10



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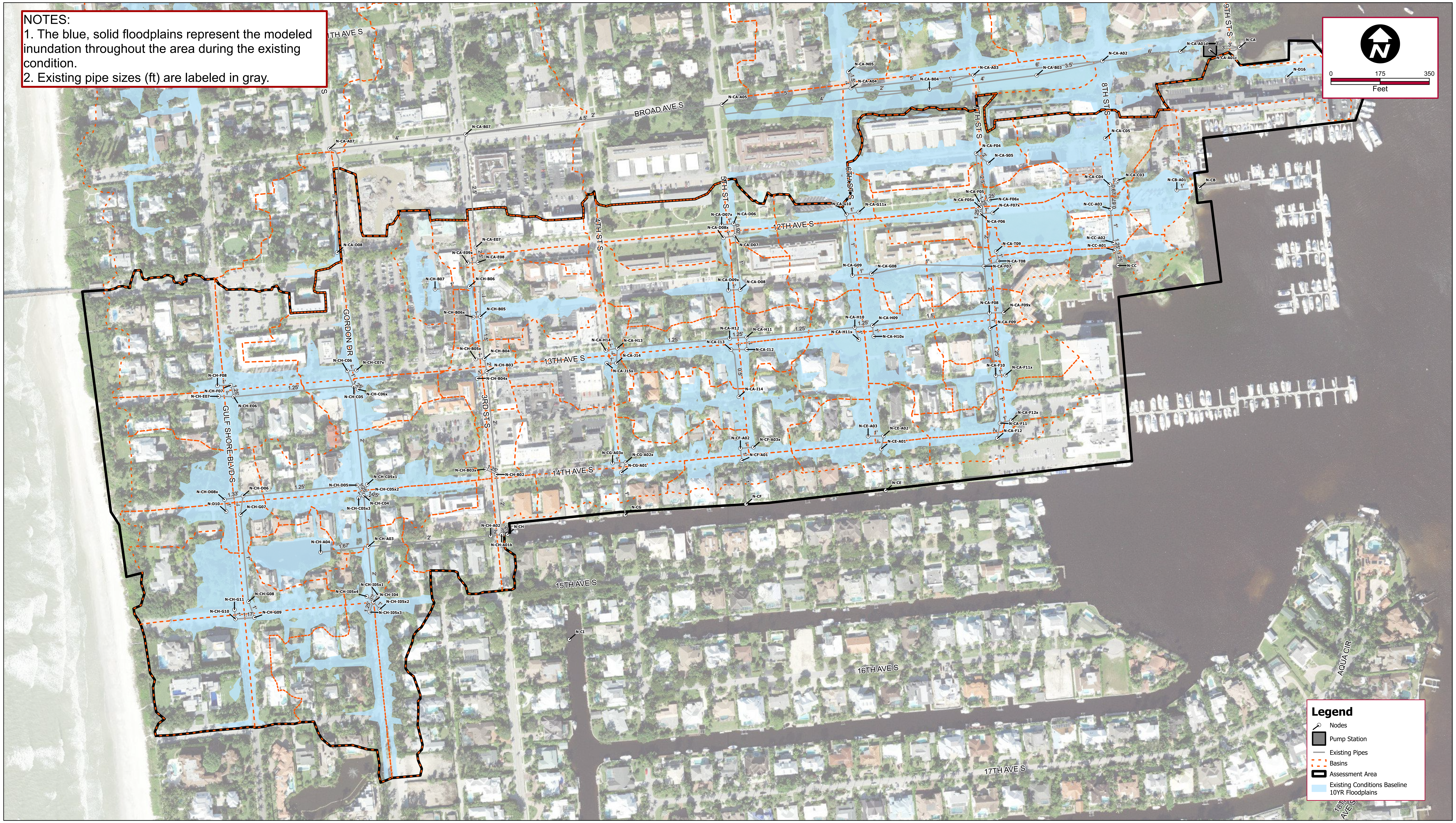
AREA B
EXISTING CONDITIONS
BASELINE
25YR MODEL RESULTS

FIGURE
01-B-25



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AREA C
EXISTING CONDITIONS
BASELINE
10YR MODEL RESULTS

FIGURE
01-C-10

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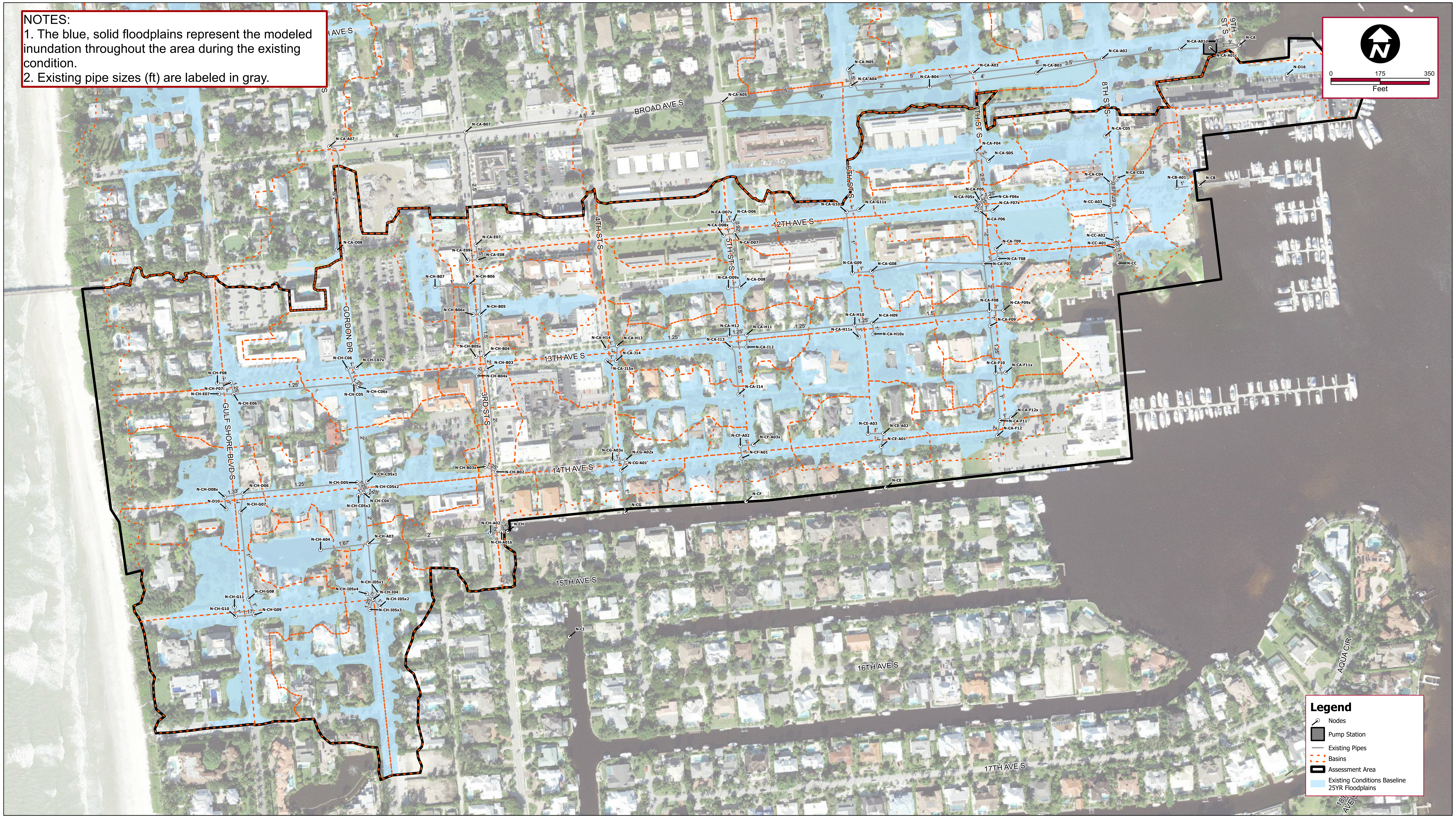

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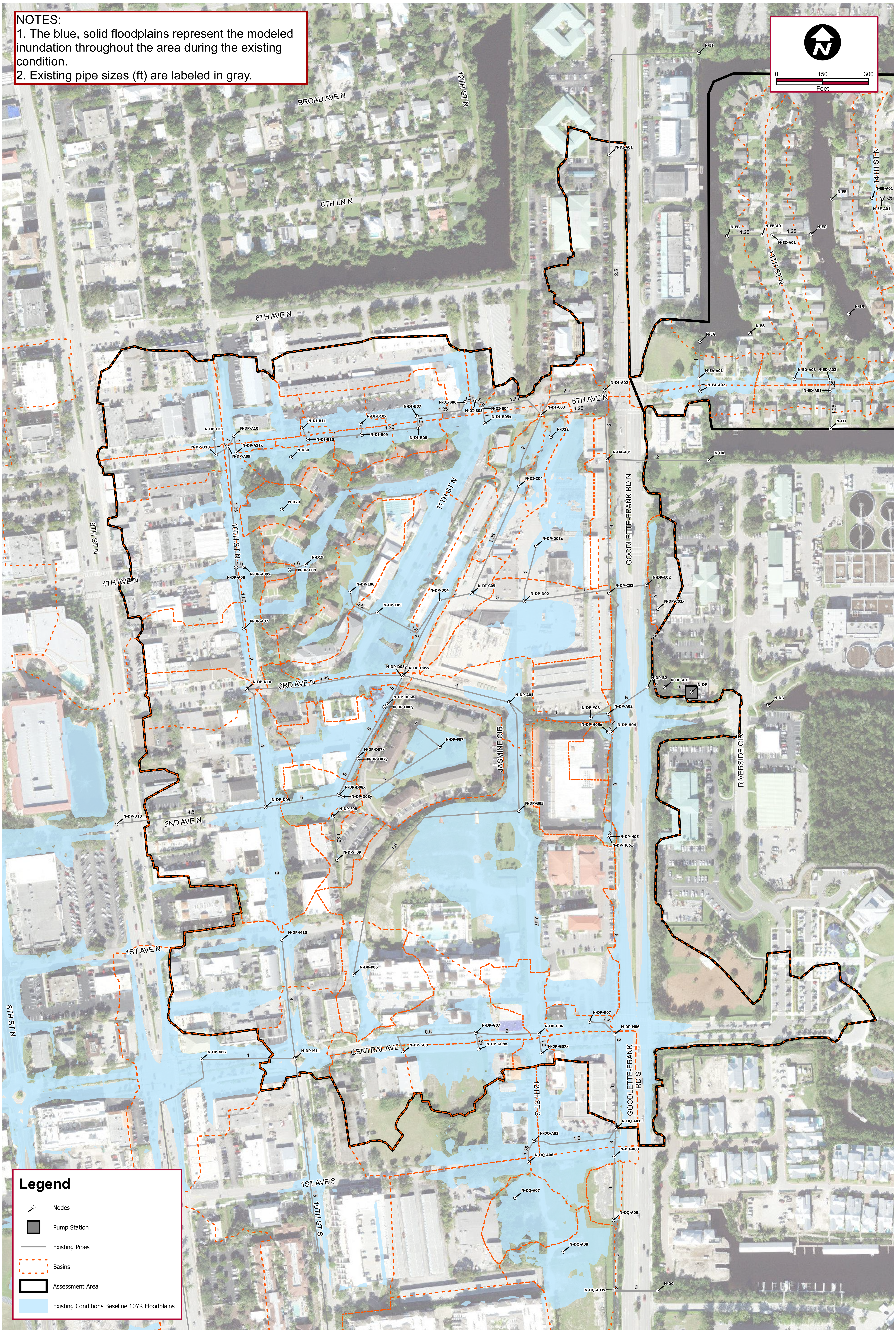
AREA C
EXISTING CONDITIONS
BASELINE
25YR MODEL RESULTS

FIGURE 01-C-25

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition.
2. Existing pipe sizes (ft) are labeled in gray.



Legend

- Nodes
- Pump Station
- Existing Pipes
- Basins
- Assessment Area
- Existing Conditions Baseline 10YR Floodplains

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AREA D
EXISTING CONDITIONS BASELINE
10YR MODEL RESULTS

FIGURE
01-D-10

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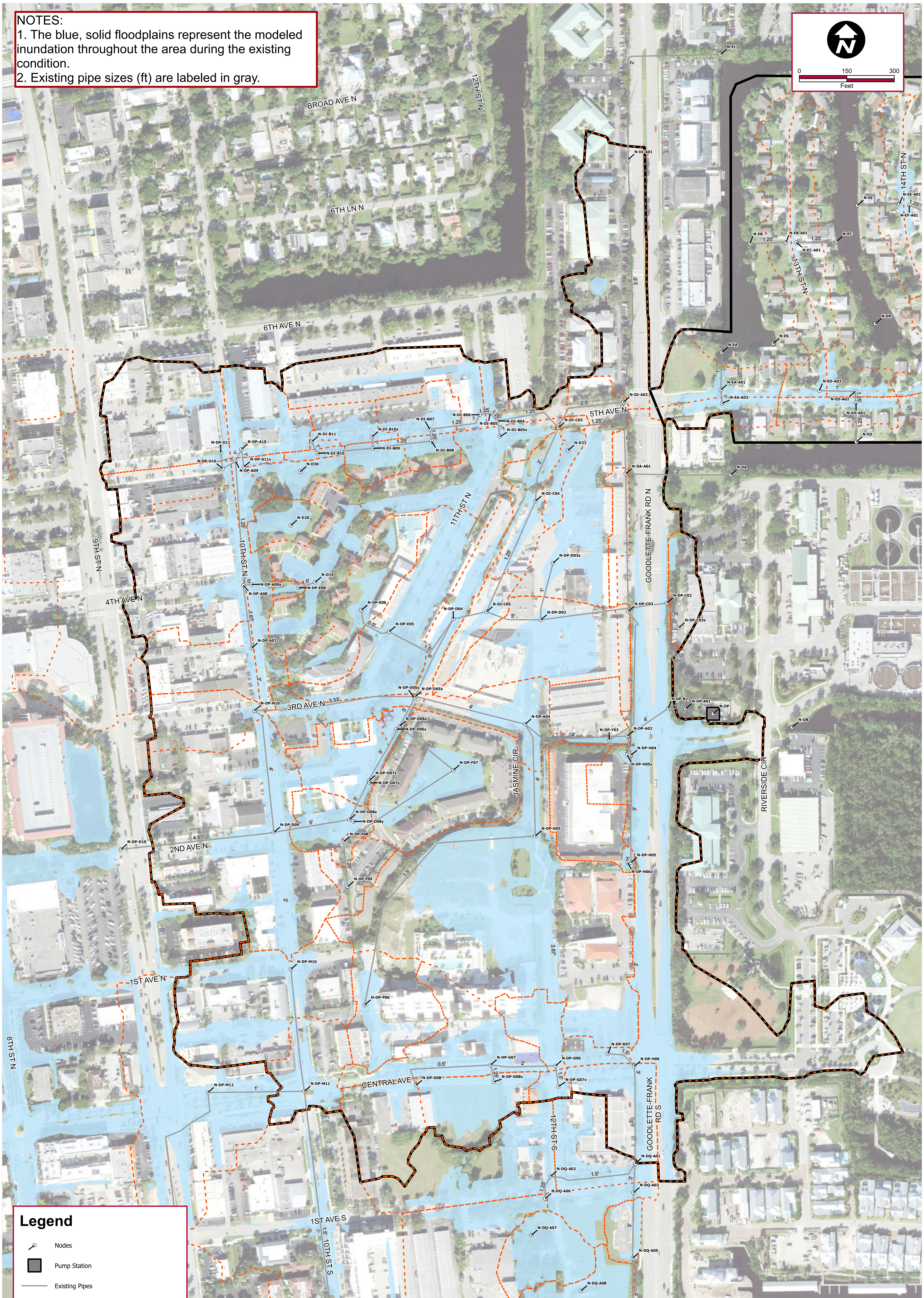

Legend

- Nodes
- Pump Station
- Existing Pipes
- Basins
- Assessment Area
- Existing Conditions Baseline 25YR Floodplains

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AREA D
EXISTING CONDITIONS
BASELINE
25YR MODEL RESULTS

FIGURE
01-D-25

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition.
2. Existing pipe sizes (ft) are labeled in gray.

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AREA E
EXISTING CONDITIONS
BASELINE
10YR MODEL RESULTS

FIGURE

01-E-10

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition.
2. Existing pipe sizes (ft) are labeled in gray.

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AREA E
EXISTING CONDITIONS
BASELINE
25YR MODEL RESULTS

FIGURE

01-E-25

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NOTES:
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2. Existing pipe sizes (ft) are labeled in gray.

Legend
- Nodes
- Pump Station
- Existing Pipes
- Basins
- Assessment Area
- Existing Conditions Baseline 10YR Floodplains

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OFFSITE
EXISTING CONDITIONS
BASELINE
10YR MODEL RESULTS

FIGURE
01-OFFSITE-10

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition.
2. Existing pipe sizes (ft) are labeled in gray.

Legend
- Nodes
- Pump Station
- Existing Pipes
- Basins
- Assessment Area
- Existing Conditions Baseline 25YR Floodplains

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OFFSITE
EXISTING CONDITIONS
BASELINE
25YR MODEL RESULTS

FIGURE
01-OFFSITE-25

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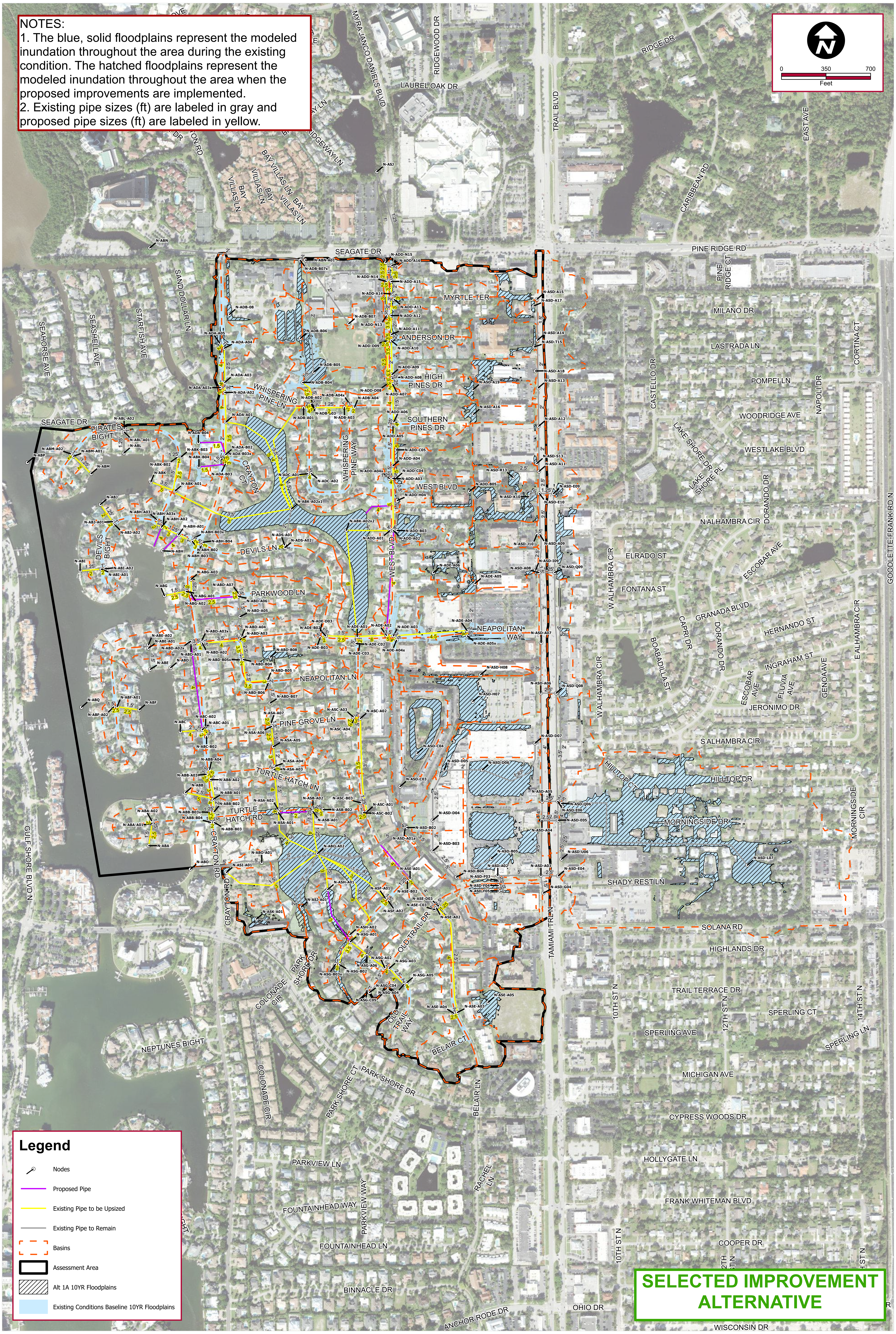
Improvement Alternatives

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition. The hatched floodplains represent the modeled inundation throughout the area when the proposed improvements are implemented.
2. Existing pipe sizes (ft) are labeled in gray and proposed pipe sizes (ft) are labeled in yellow.



Legend

- Nodes
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 1A 10YR Floodplains
- Existing Conditions Baseline 10YR Floodplains

SELECTED IMPROVEMENT ALTERNATIVE

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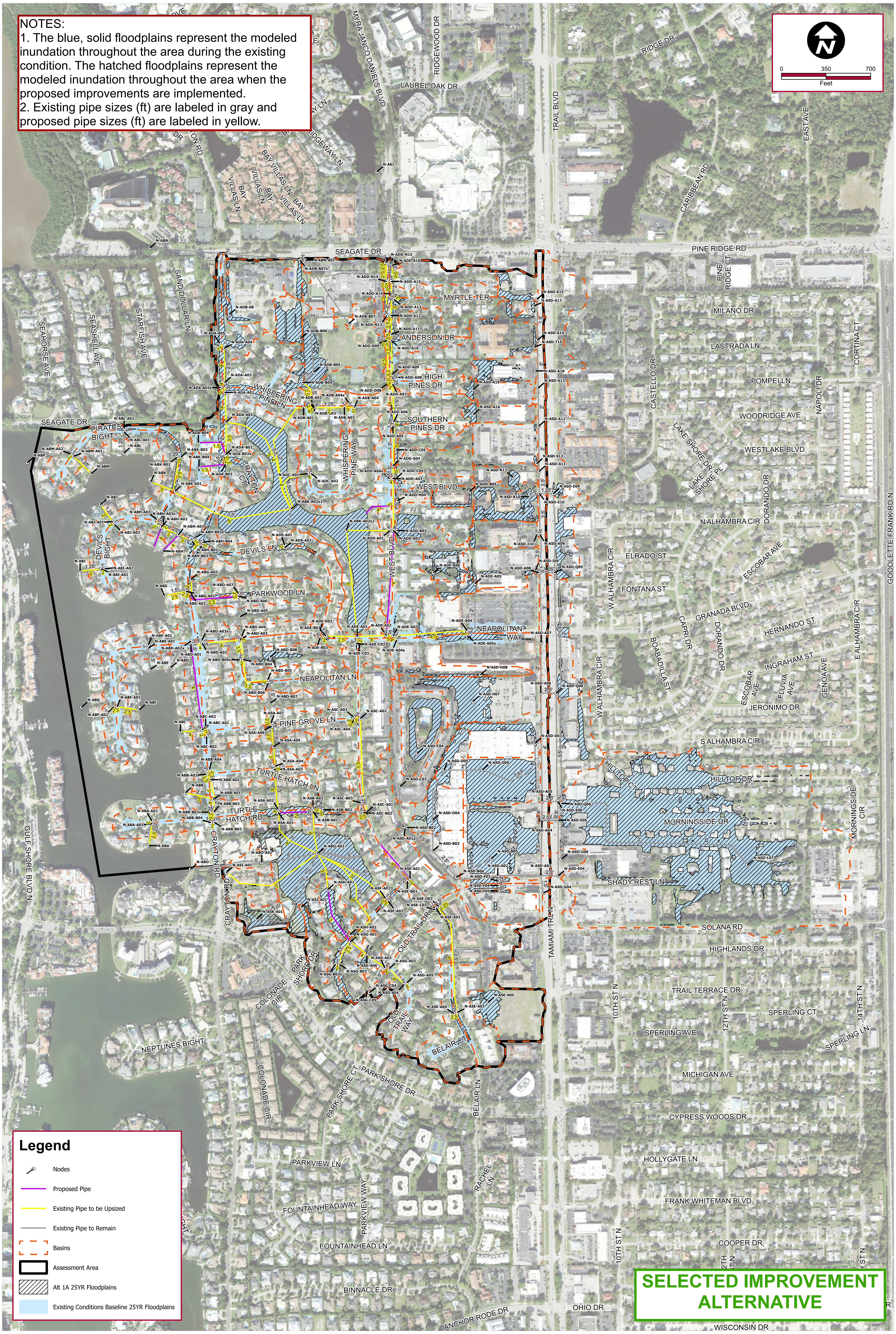
IMPROVEMENT ALT 1A
UPSIZE AND ADD PIPES
10 YEAR MODEL RESULTS

FIGURE
02-1A-10

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition. The hatched floodplains represent the modeled inundation throughout the area when the proposed improvements are implemented.
2. Existing pipe sizes (ft) are labeled in gray and proposed pipe sizes (ft) are labeled in yellow.



Legend

- Nodes
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 1A 25YR Floodplains
- Existing Conditions Baseline 25YR Floodplains

SELECTED IMPROVEMENT ALTERNATIVE

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IMPROVEMENT ALT 1A
UPSIZE AND ADD PIPES
25 YEAR MODEL RESULTS

FIGURE
02-1A-25

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition. The hatched floodplains represent the modeled inundation throughout the area when the proposed improvements are implemented.
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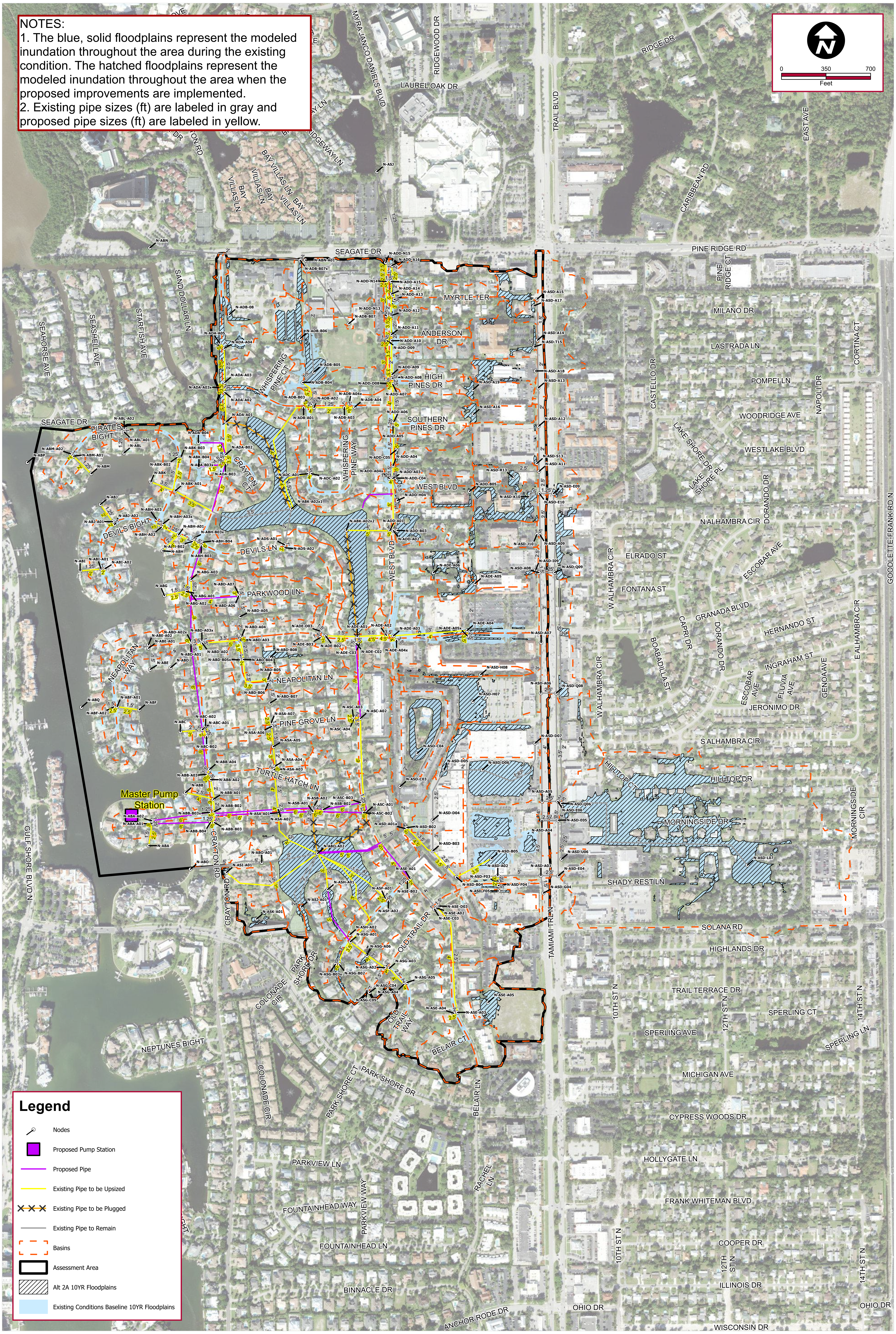

Legend

- Nodes
- Proposed Pump Station
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to be Plugged
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 2A 10YR Floodplains
- Existing Conditions Baseline 10YR Floodplains

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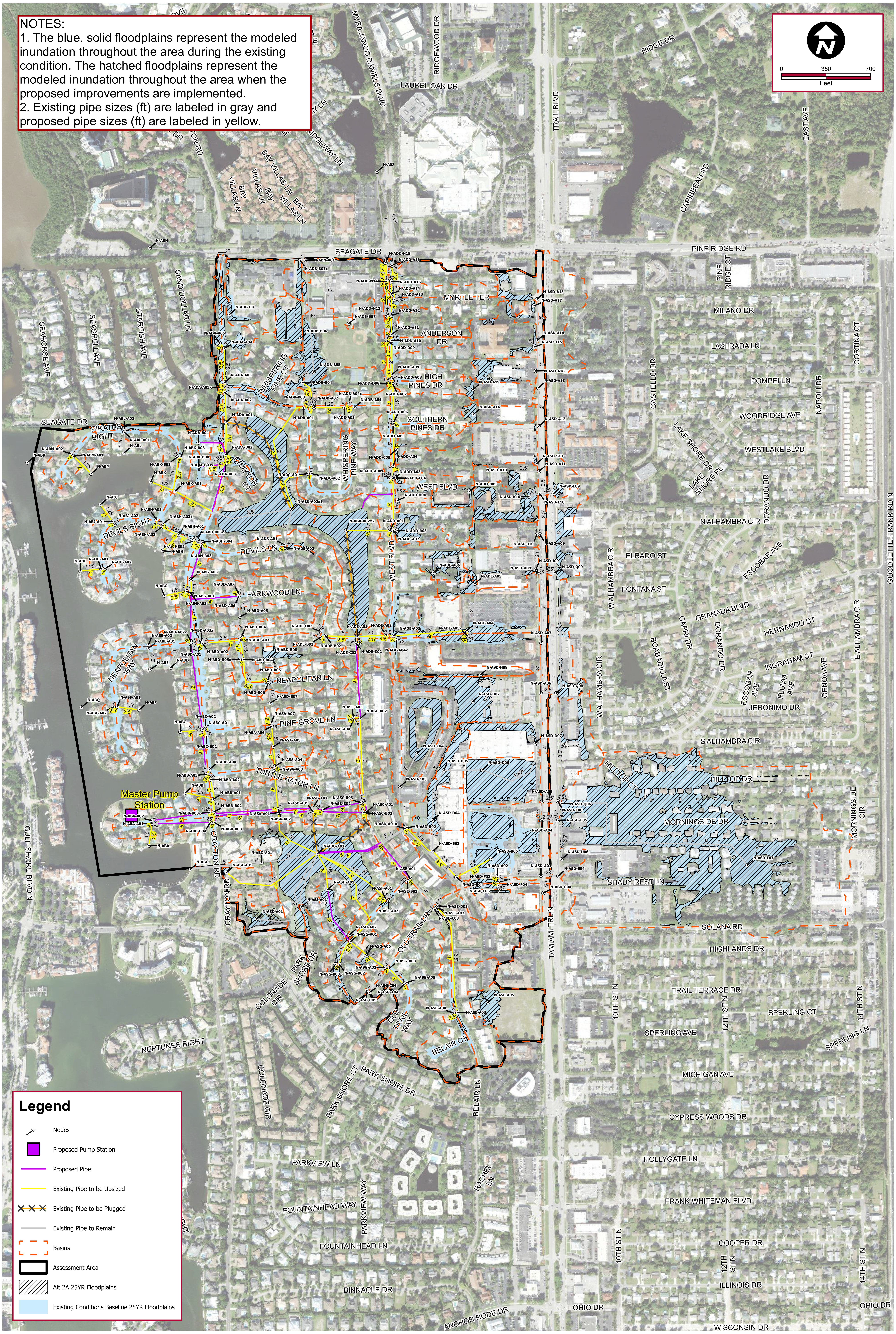
IMPROVEMENT ALT 2A
MASTER PUMP STATION
10 YEAR MODEL RESULTS

FIGURE
02-2A-10



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2. Existing pipe sizes (ft) are labeled in gray and proposed pipe sizes (ft) are labeled in yellow.

0 350 700
Feet

Legend

- Nodes
- Proposed Pump Station
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to be Plugged
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 2A 25YR Floodplains
- Existing Conditions Baseline 25YR Floodplains

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IMPROVEMENT ALT 2A
MASTER PUMP STATION
25 YEAR MODEL RESULTS

FIGURE
02-2A-25

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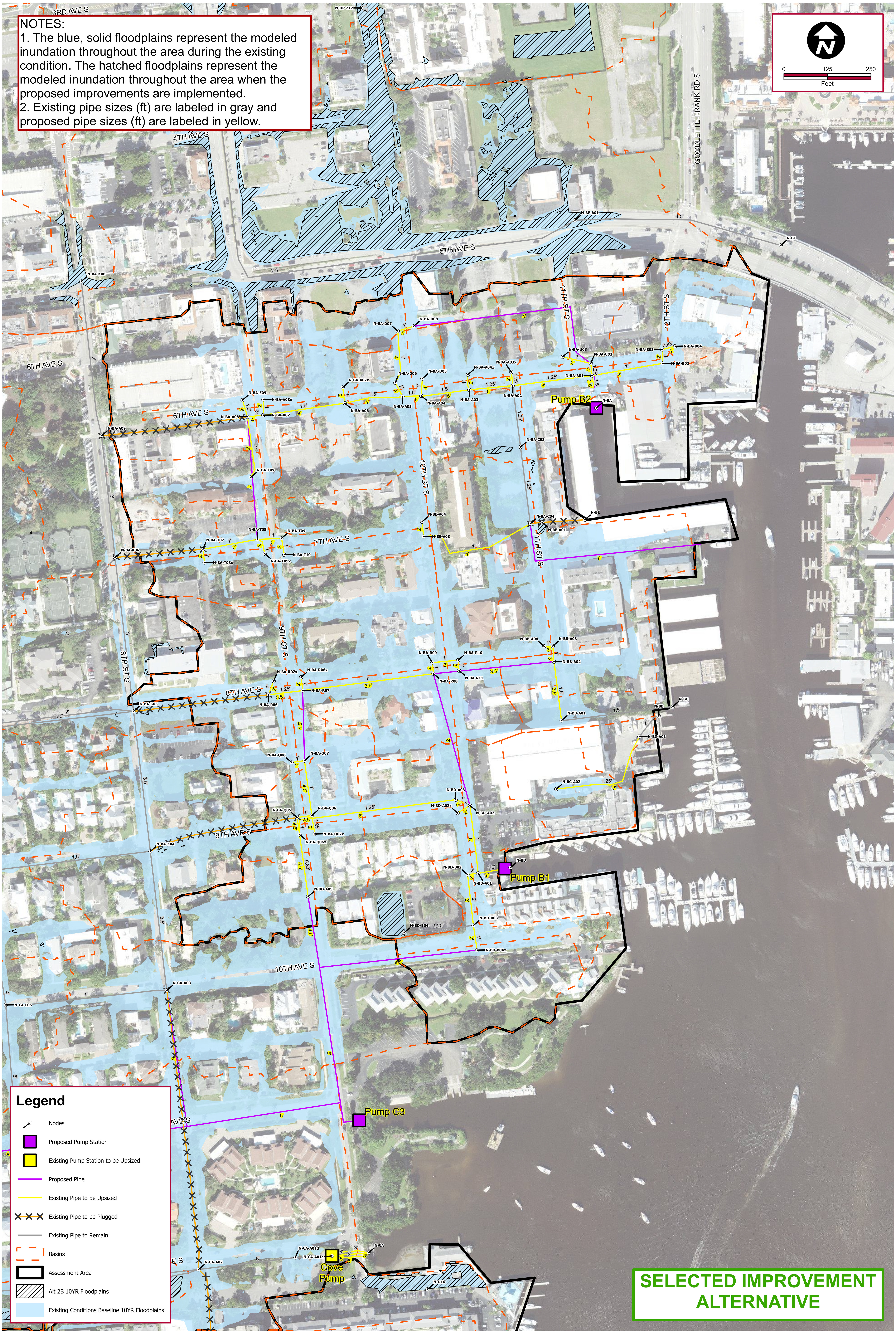

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IMPROVEMENT ALT 2B
NAPLES BAY
PUMP STATIONS
10 YEAR MODEL RESULTS

FIGURE
02-2B-10

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition. The hatched floodplains represent the modeled inundation throughout the area when the proposed improvements are implemented.
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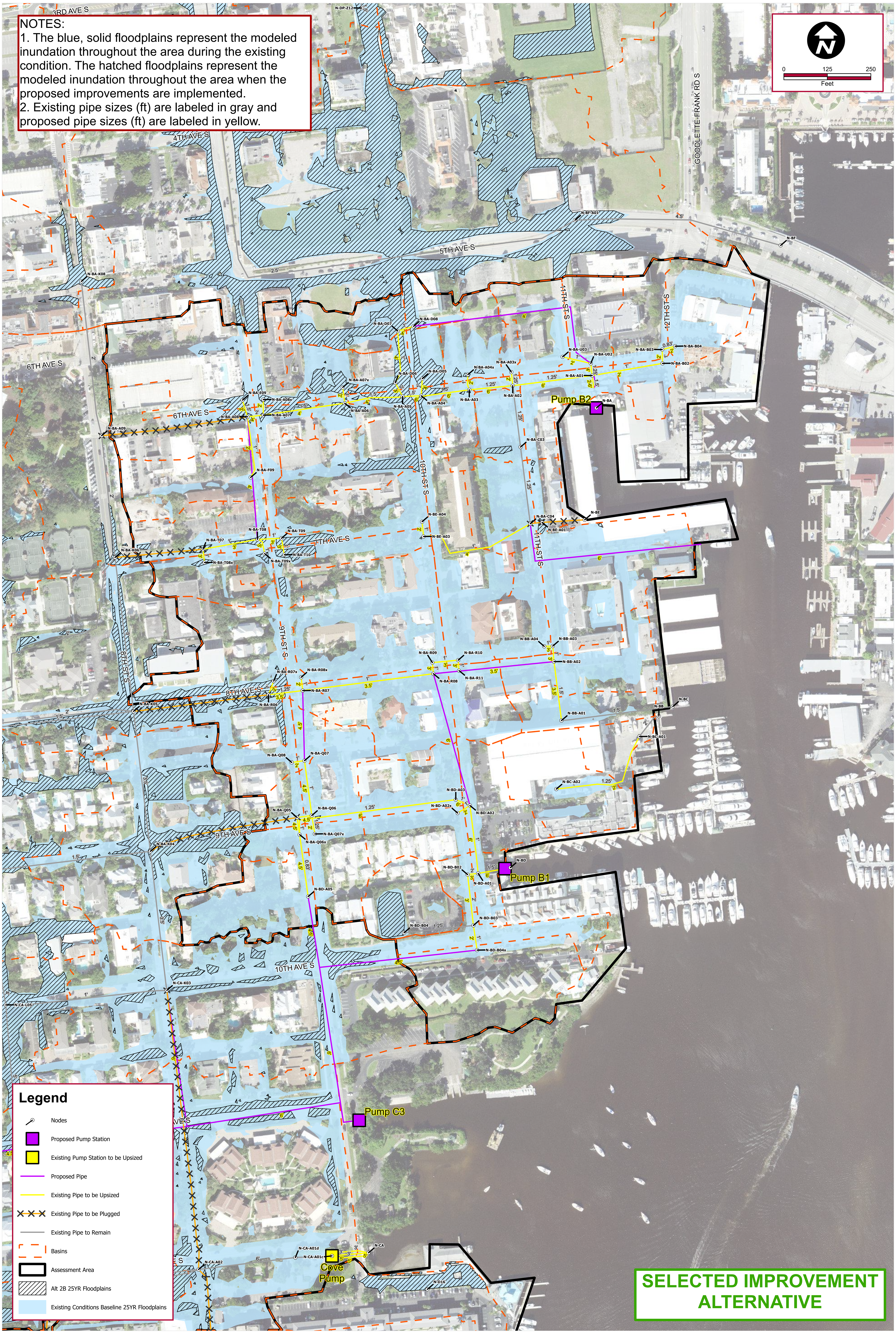

Legend

- Nodes
- Proposed Pump Station
- Existing Pump Station to be Upsized
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to be Plugged
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 2B 25YR Floodplains
- Existing Conditions Baseline 25YR Floodplains

SELECTED IMPROVEMENT ALTERNATIVE

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IMPROVEMENT ALT 2B
NAPLES BAY
PUMP STATIONS
25 YEAR MODEL RESULTS

FIGURE
02-2B-25

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition. The hatched floodplains represent the modeled inundation throughout the area when the proposed improvements are implemented.
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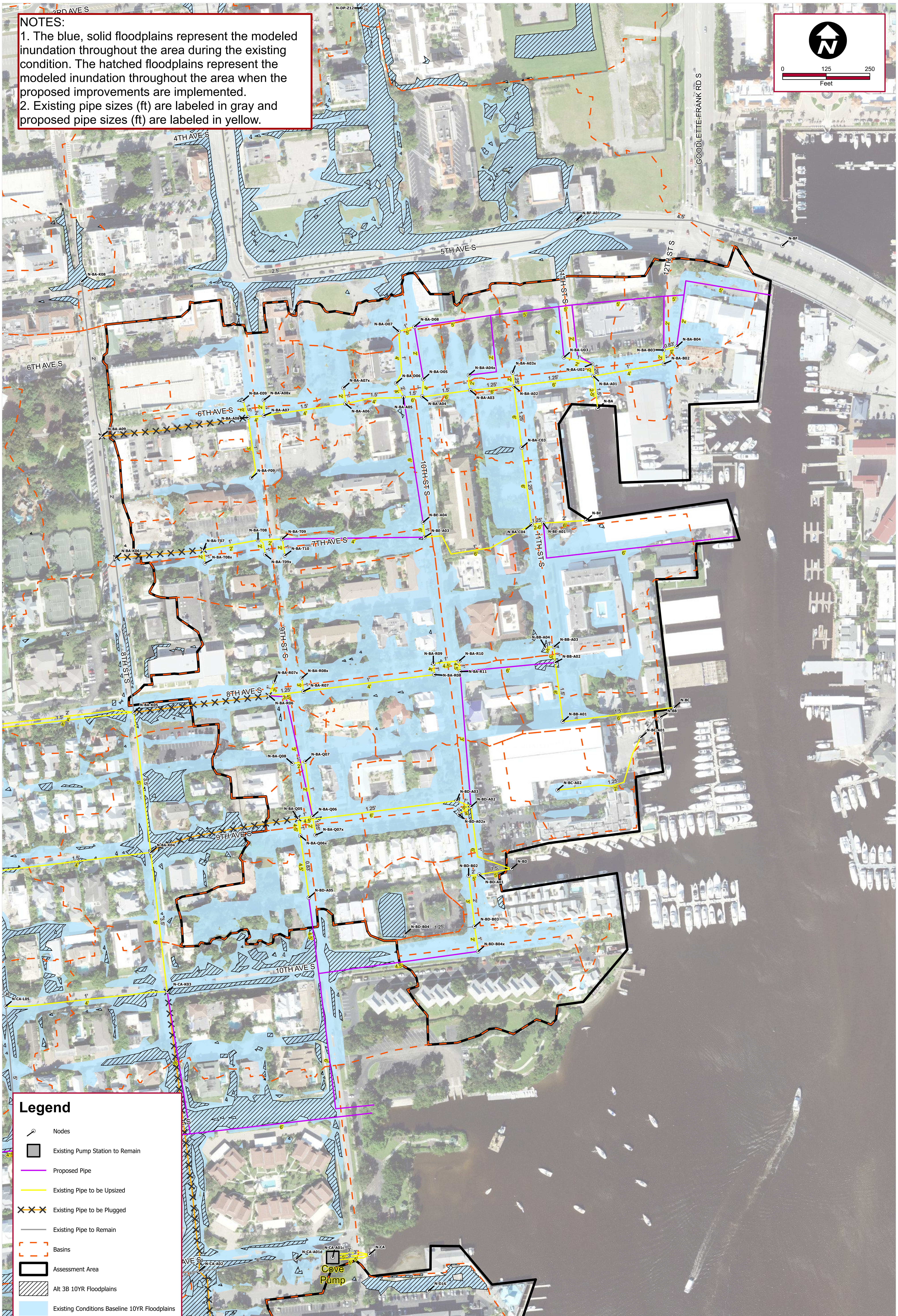

Legend

- Nodes
- Existing Pump Station to Remain
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to be Plugged
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 3B 10YR Floodplains
- Existing Conditions Baseline 10YR Floodplains

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IMPROVEMENT ALT 3B
PIPES UPSIZED WITH
NEW CONNECTIONS
10 YEAR MODEL RESULTS

FIGURE
02-3B-10

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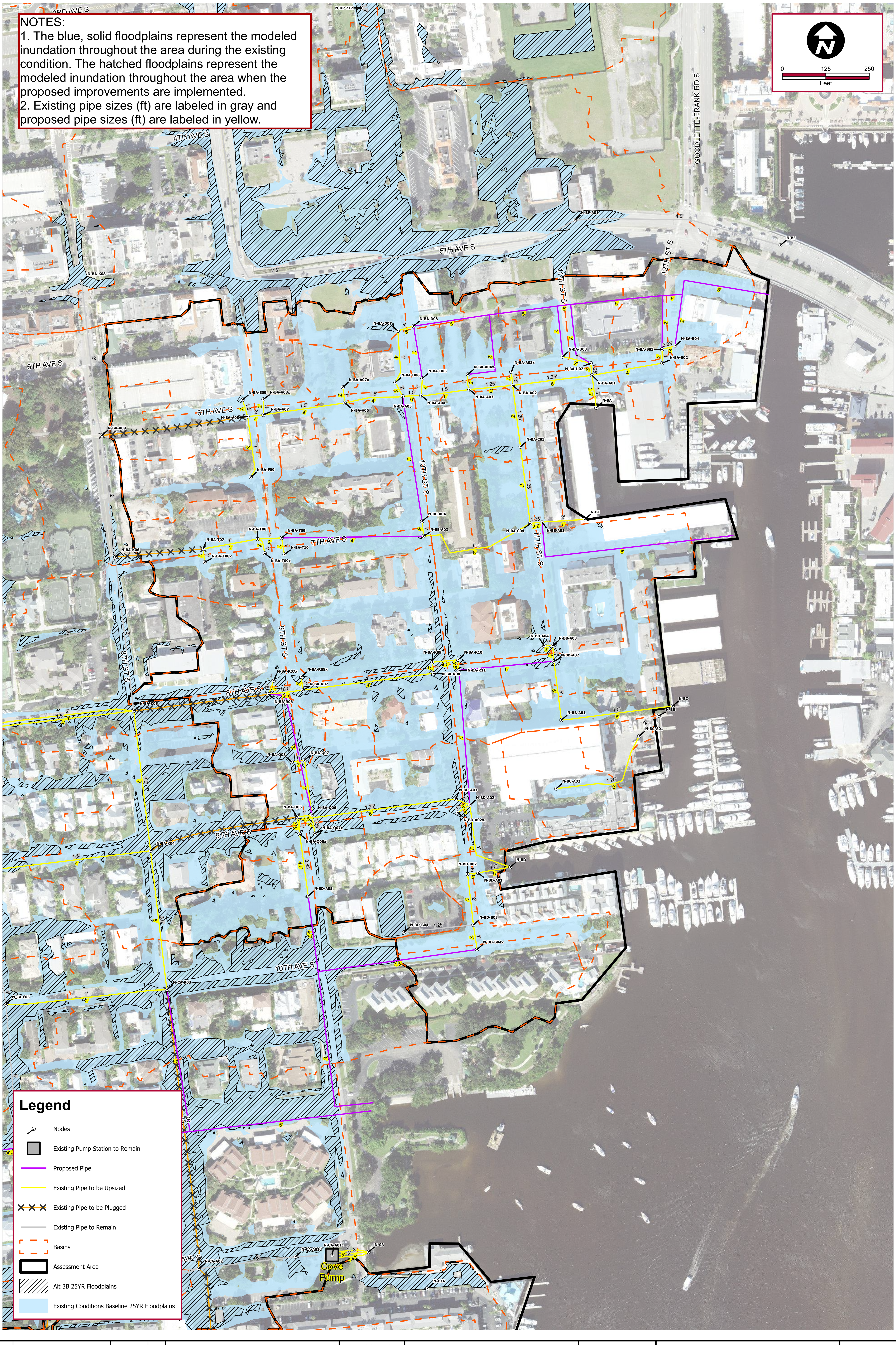

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IMPROVEMENT ALT 3B PIPES UPSIZED WITH NEW CONNECTIONS 25 YEAR MODEL RESULTS

FIGURE 02-3B-25

NOTES:
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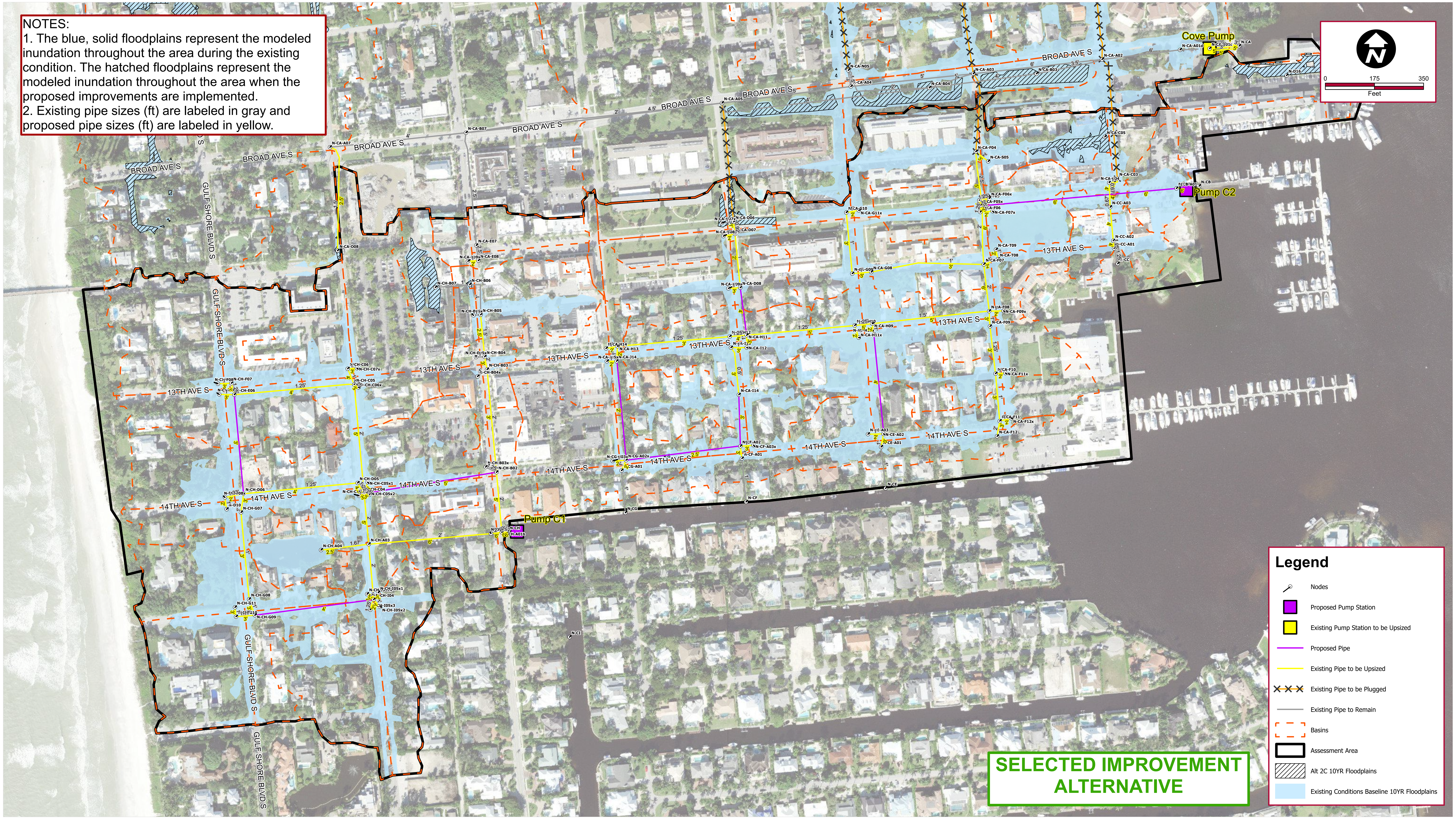

Legend

- Nodes
- Proposed Pump Station
- Existing Pump Station to be Upsized
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to be Plugged
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 2C 10YR Floodplains
- Existing Conditions Baseline 10YR Floodplains

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DRAWN BY	KHA
CHECKED BY	KHA

BASINS ASSESSMENT

PREPARED FOR

CITY OF NAPLES

IMPROVEMENT ALT 2C
MASTER PUMP STATIONS
10 YEAR MODEL RESULTS

FIGURE

02-2C-10

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\02 Improvement Alternatives\Improvement Alts\Improvement Alts.aprx - 11/30/2023 1:30 PM - Henry Albright

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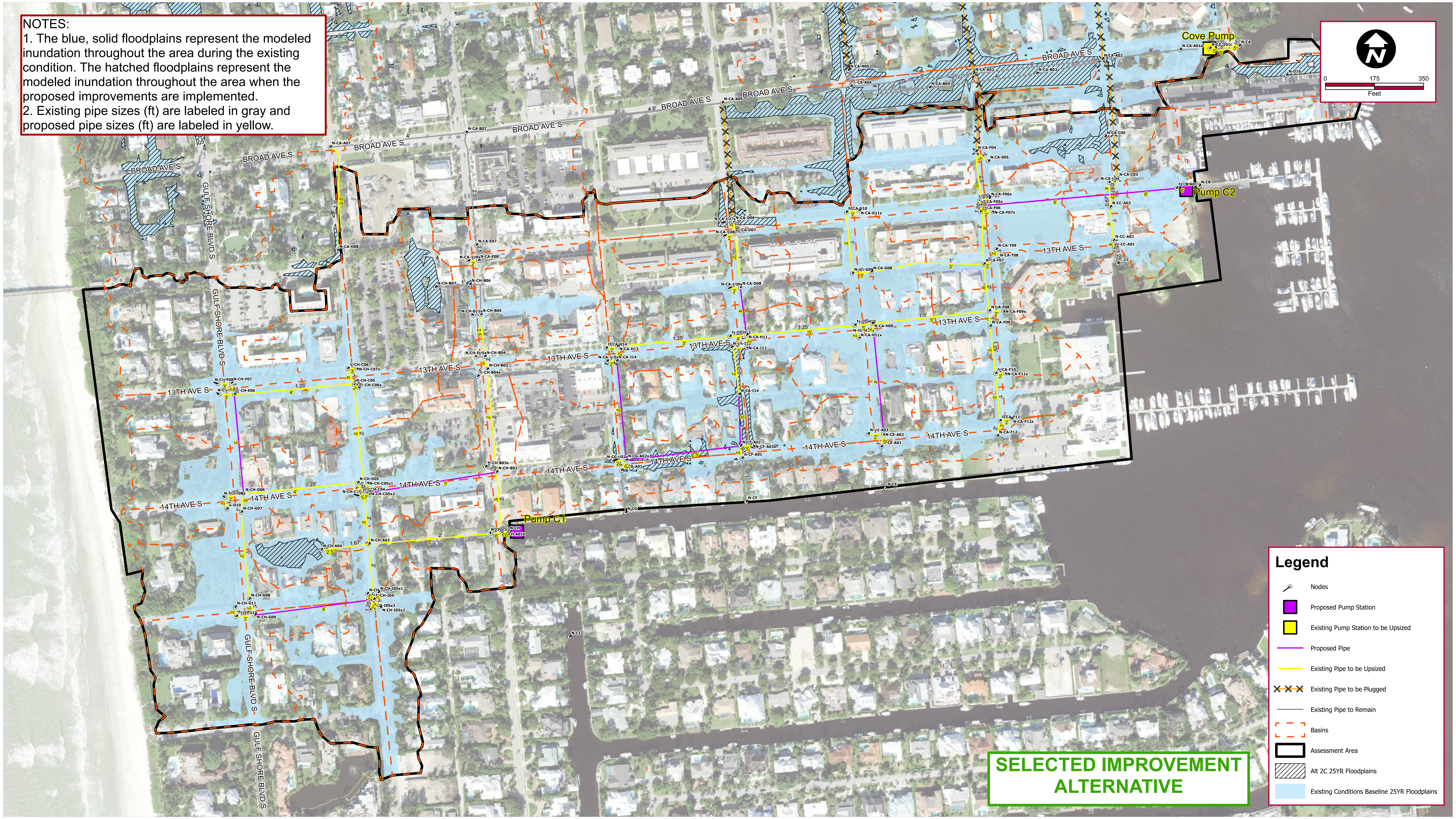

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IMPROVEMENT ALT 2C
MASTER PUMP STATIONS
25 YEAR MODEL RESULTS

FIGURE

02-2C-25

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\02 Improvement Alternatives\Improvement Alts\Improvement Alts.aprx - 11/30/2023 1:28 PM - Henry Albright

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IMPROVEMENT ALT 3C PUMP STATIONS AND GRAVITY OUTFALLS 10 YEAR MODEL RESULTS

FIGURE

02-3C-10

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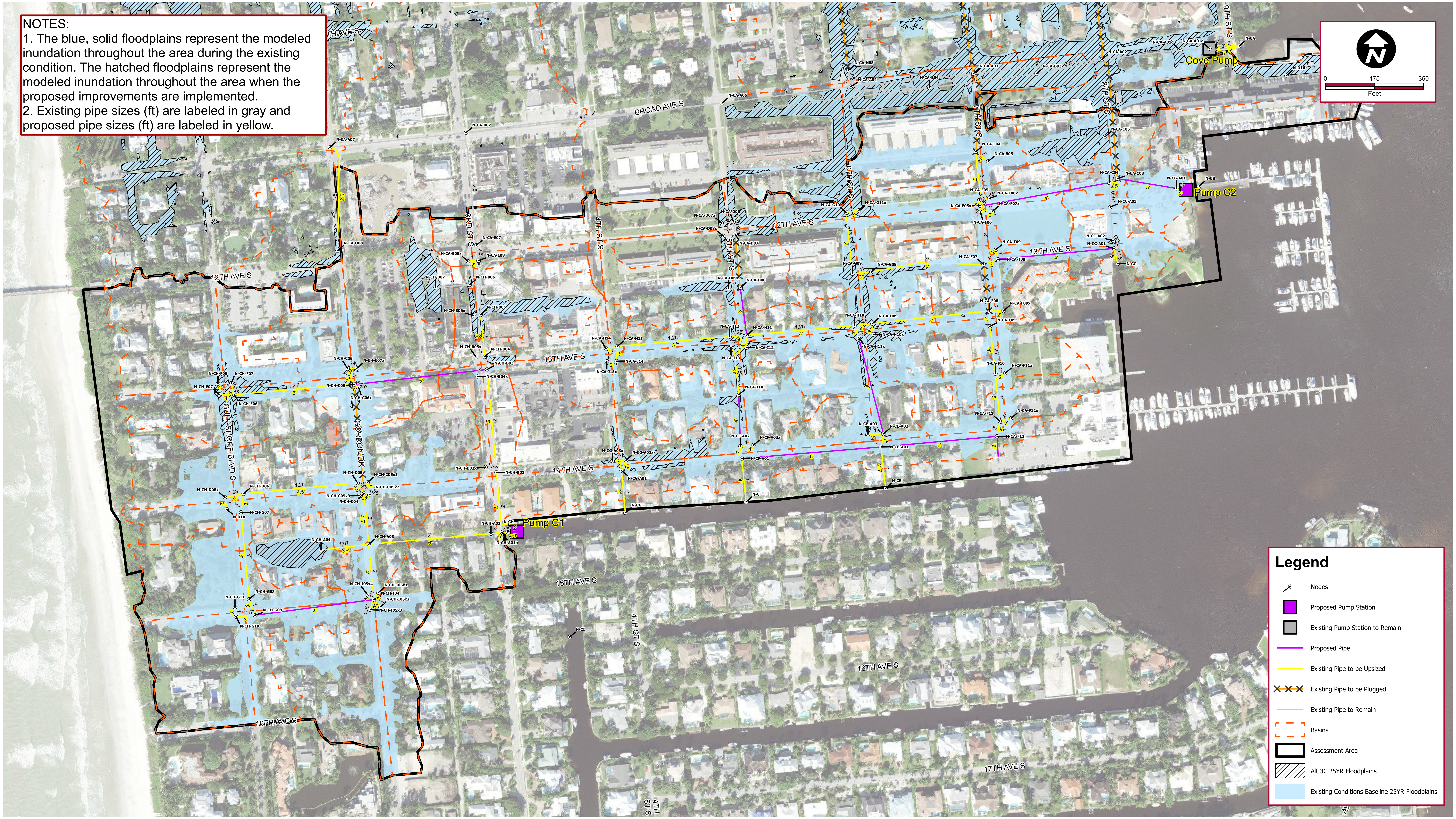

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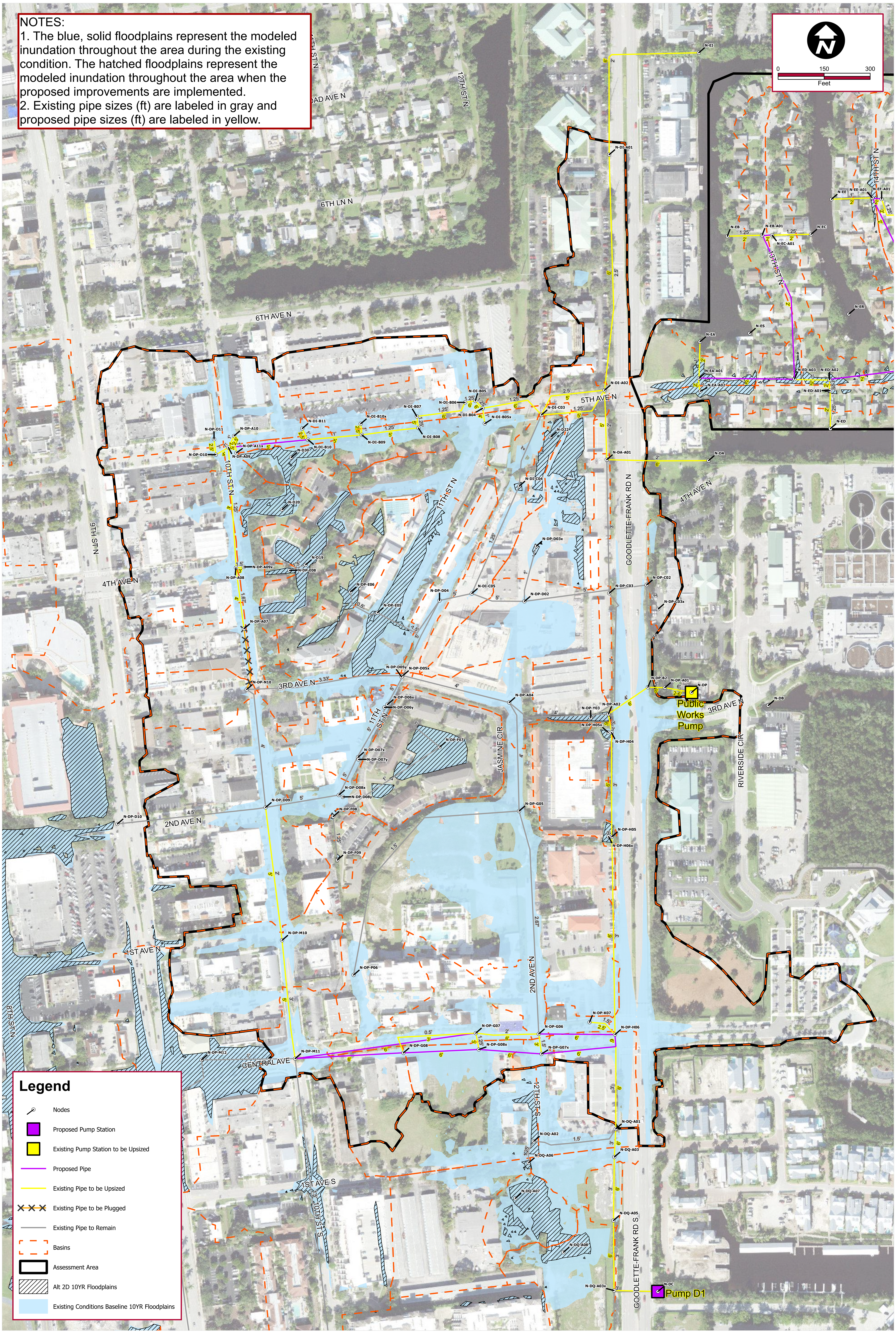
CITY OF NAPLES

IMPROVEMENT ALT 3C
PUMP STATIONS AND
GRAVITY OUTFALLS
25 YEAR MODEL RESULTS

FIGURE

02-3C-25



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CITY OF NAPLES FLORIDA

IMPROVEMENT ALT 2D
UPSIZE PIPES AND
ADD PUMP
10 YEAR MODEL RESULTS

FIGURE
02-2D-10

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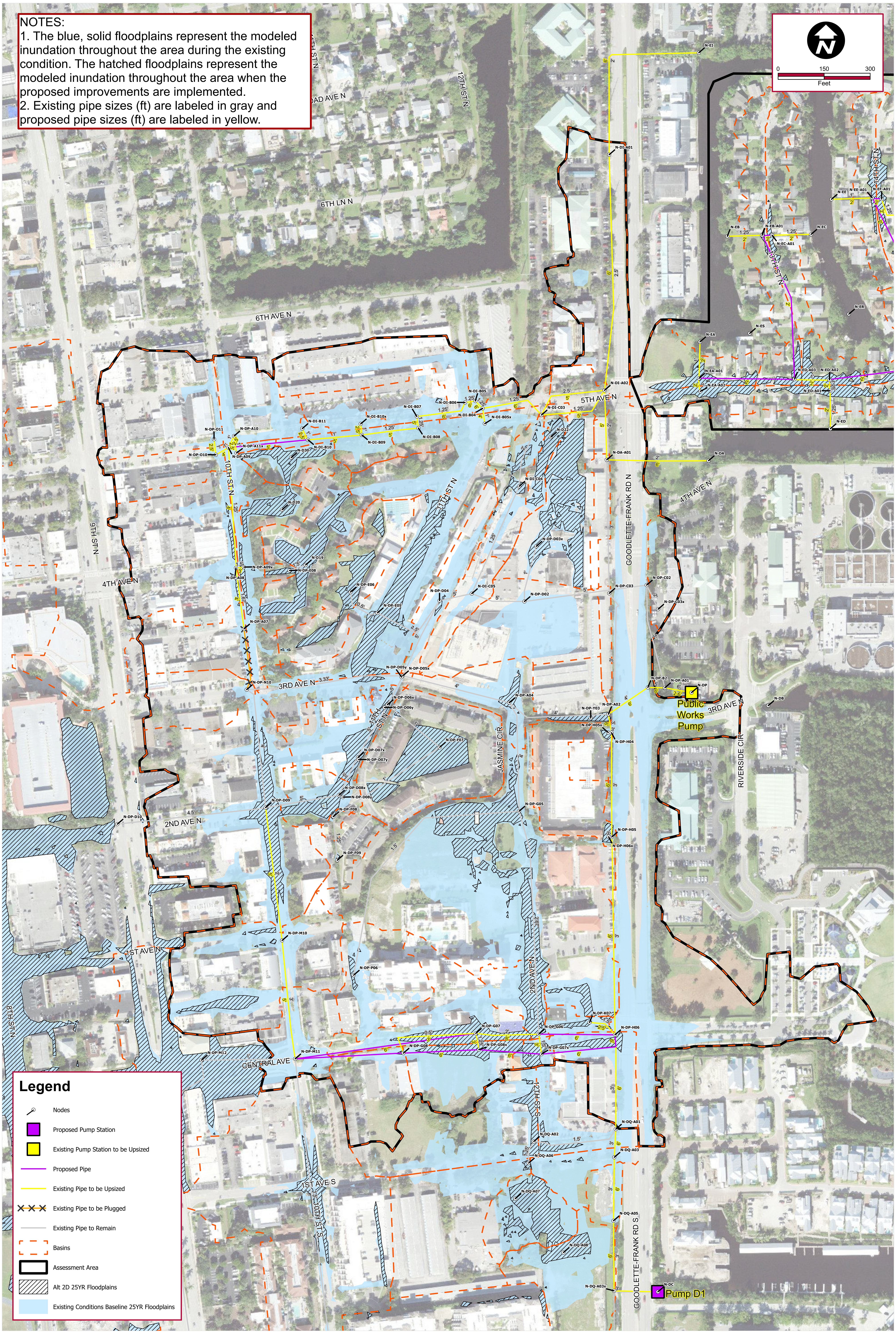

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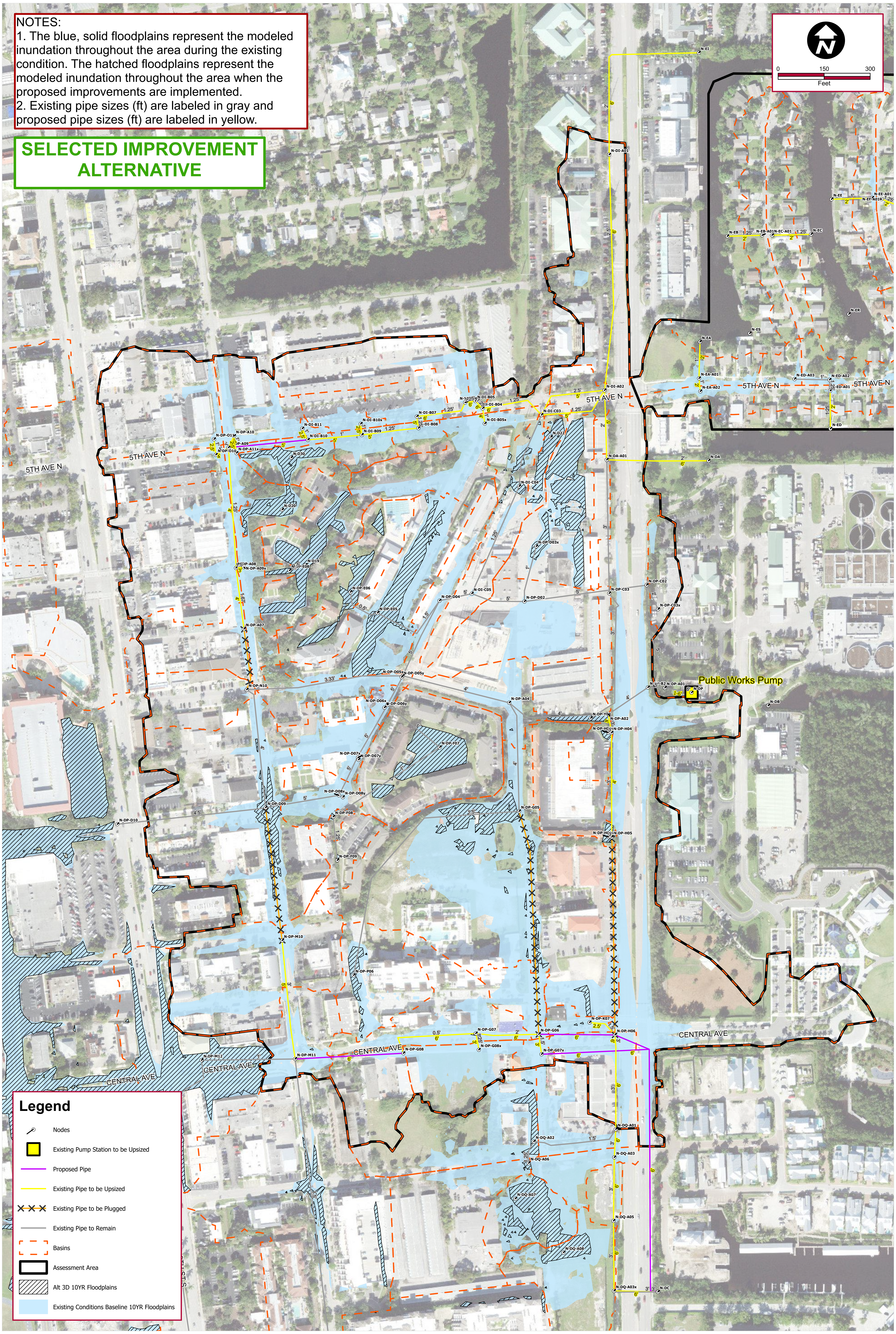
CITY OF NAPLES FLORIDA

IMPROVEMENT ALT 2D
UPSIZE PIPES AND
ADD PUMP
25 YEAR MODEL RESULTS

FIGURE
02-2D-25



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CITY OF NAPLES FLORIDA

IMPROVEMENT ALT 3D
FULLY DISCONNECT FROM PUBLIC WORKS PUMPS
10 YEAR MODEL RESULTS

FIGURE
02-3D-10

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023 09 21\02 Improvement Alternatives\Improvement Alts.aprx - 11/30/2023 1:31 PM - Henry Albright

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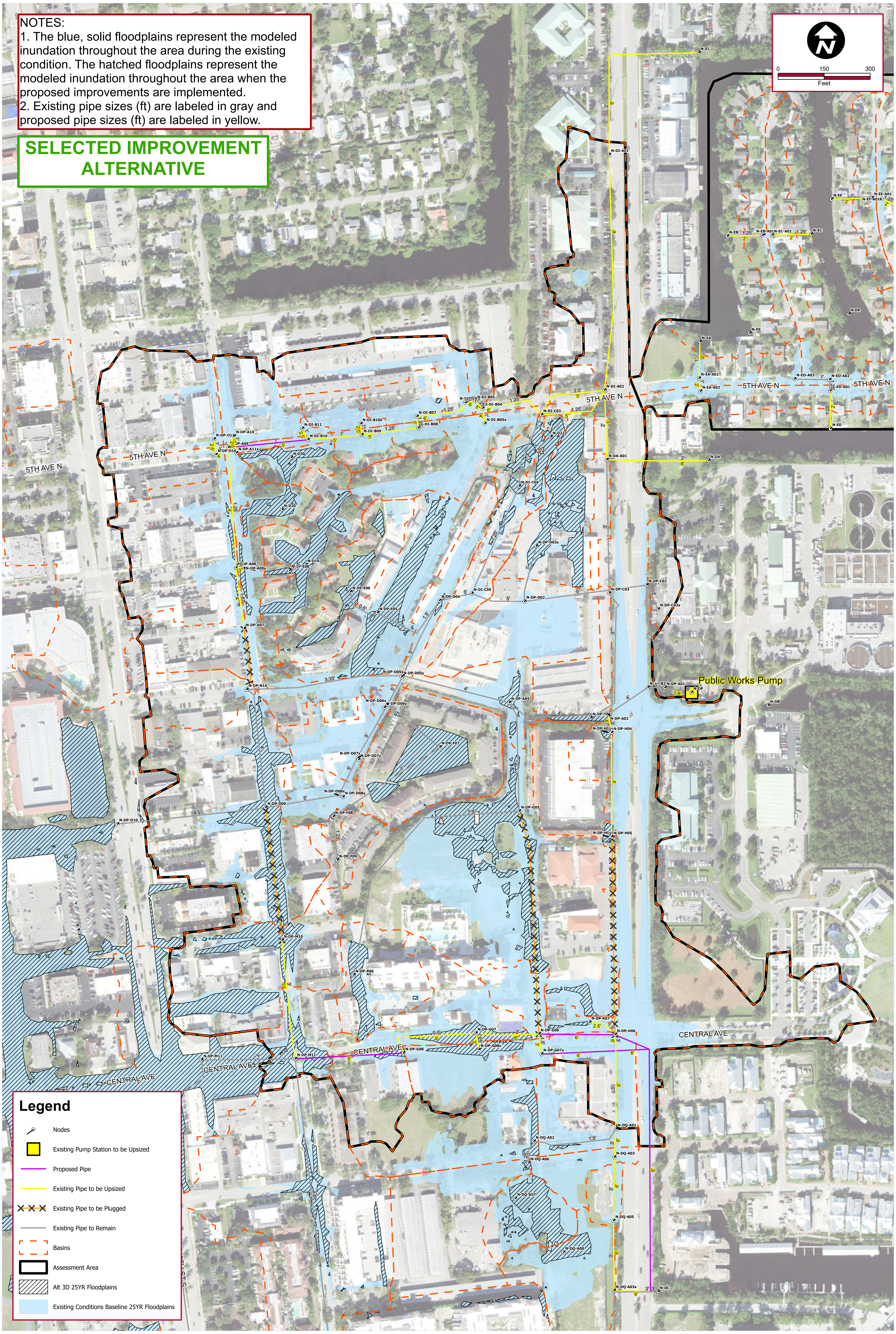
SELECTED IMPROVEMENT ALTERNATIVE



Legend

- Nodes
- Existing Pump Station to be Upsized
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to be Plugged
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 3D 25YR Floodplains
- Existing Conditions Baseline 25YR Floodplains

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BASINS ASSESSMENT
PREPARED FOR
CITY OF NAPLES

CITY OF NAPLES FLORIDA

IMPROVEMENT ALT 3D
FULLY DISCONNECT FROM PUBLIC WORKS PUMP
25 YEAR MODEL RESULTS

FIGURE
02-3D-25

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\02 Improvement Alternatives\Improvement Alts\Improvement Alts.aprx - 11/30/2023 1:28 PM - Henry.Albright

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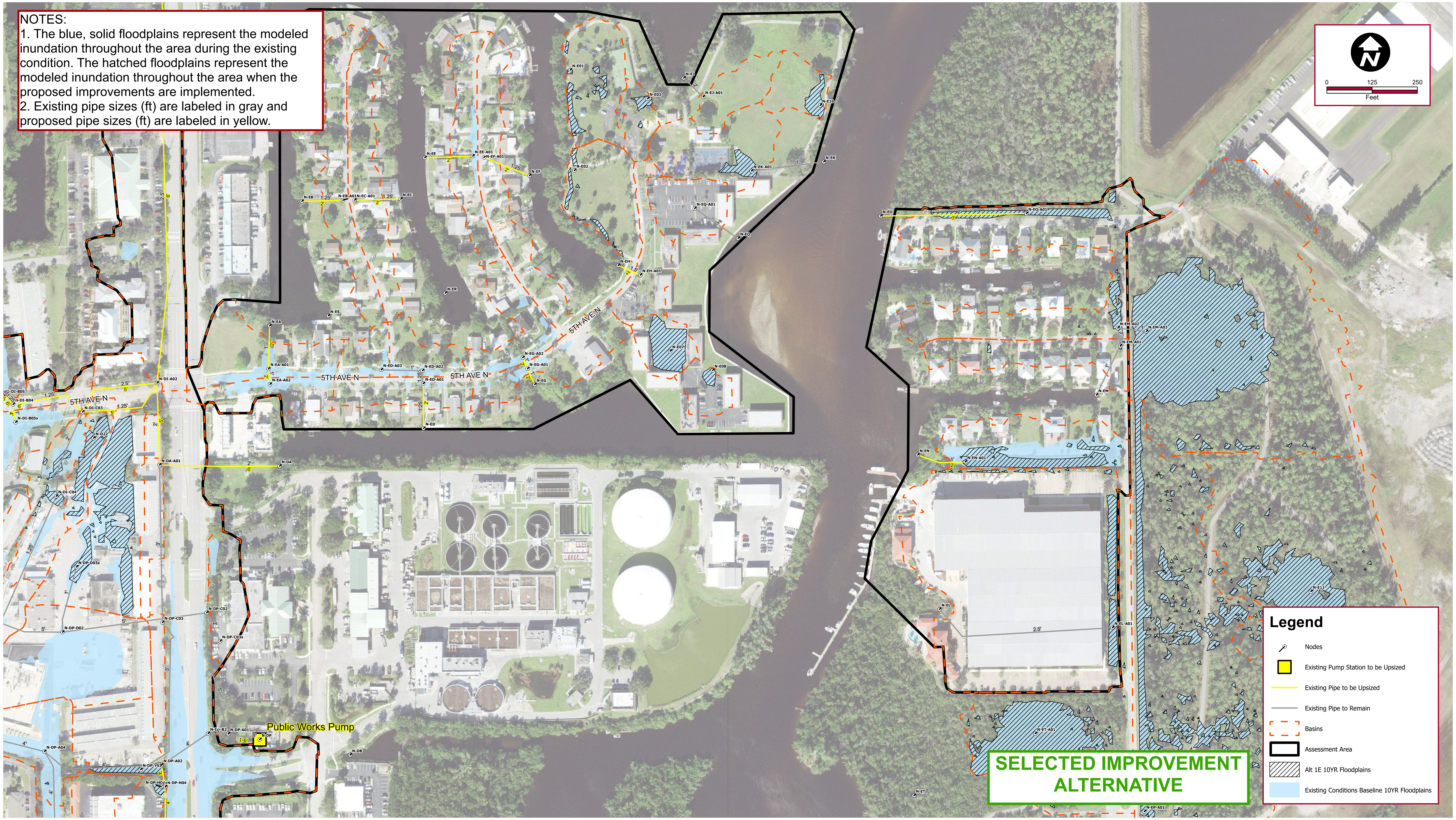

Legend

- Nodes
- Existing Pump Station to be Upsized
- Existing Pipe to be Upsized
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 1E 10YR Floodplains
- Existing Conditions Baseline 10YR Floodplains

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IMPROVEMENT ALT 1E
UPSIZE PIPES ONLY
10 YEAR MODEL RESULTS

FIGURE
02-1E-10

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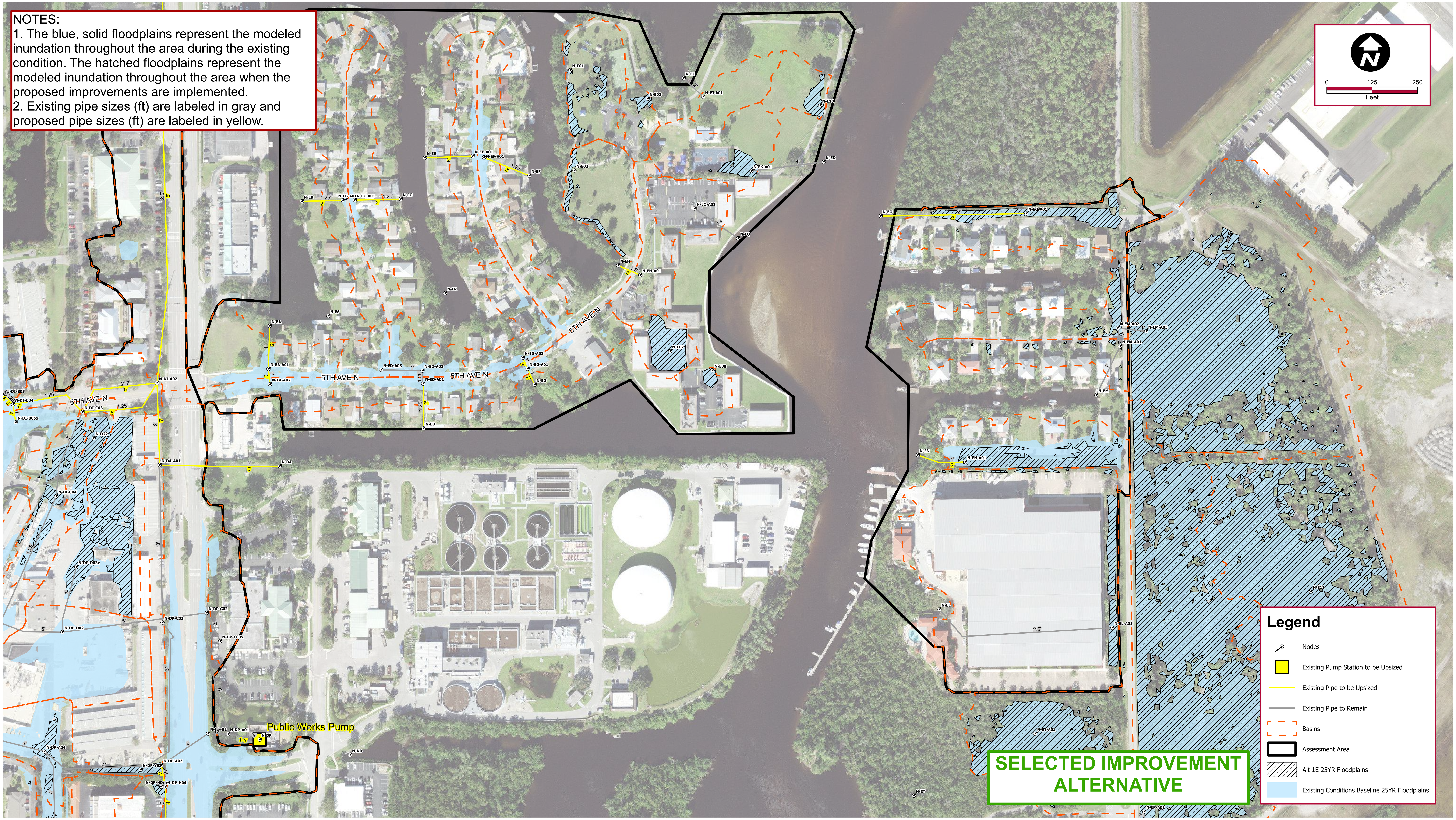

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IMPROVEMENT ALT 1E
UPSIZE PIPES ONLY
25 YEAR MODEL RESULTS

FIGURE
02-1E-25

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IMPROVEMENT ALT 2E
ADD PUMP STATION
WITH CONNECTIONS
10 YEAR MODEL RESULTS

FIGURE
02-2E-10

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\02 Improvement Alternatives\Improvement Alts\Improvement Alts.aprx - 11/30/2023 1:29 PM - Henry Albright

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IMPROVEMENT ALT 2E
ADD PUMP STATION
WITH CONNECTIONS
25 YEAR MODEL RESULTS

FIGURE

02-2E-25

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SELECTED IMPROVEMENT ALTERNATIVE

Legend

- Nodes
- Existing Pump Station to be Upsized
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to be Plugged
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 2B 25YR Floodplains
- Existing Conditions Baseline 10YR Floodplains

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BASINS ASSESSMENT

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CITY OF NAPLES

OFFSITE TRUNKLINE IMPROVEMENTS
EXISTING TAILWATER
10 YEAR MODEL RESULTS

FIGURE

02-OFFSITE-10

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Legend

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- Proposed Pipe
- Existing Pipe to be Upsized
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- Basins
- Assessment Area
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- Existing Conditions Baseline 25YR Floodplains

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OFFSITE TRUNKLINE IMPROVEMENTS
EXISTING TAILWATER
25 YEAR MODEL RESULTS

FIGURE

02-OFFSITE-25

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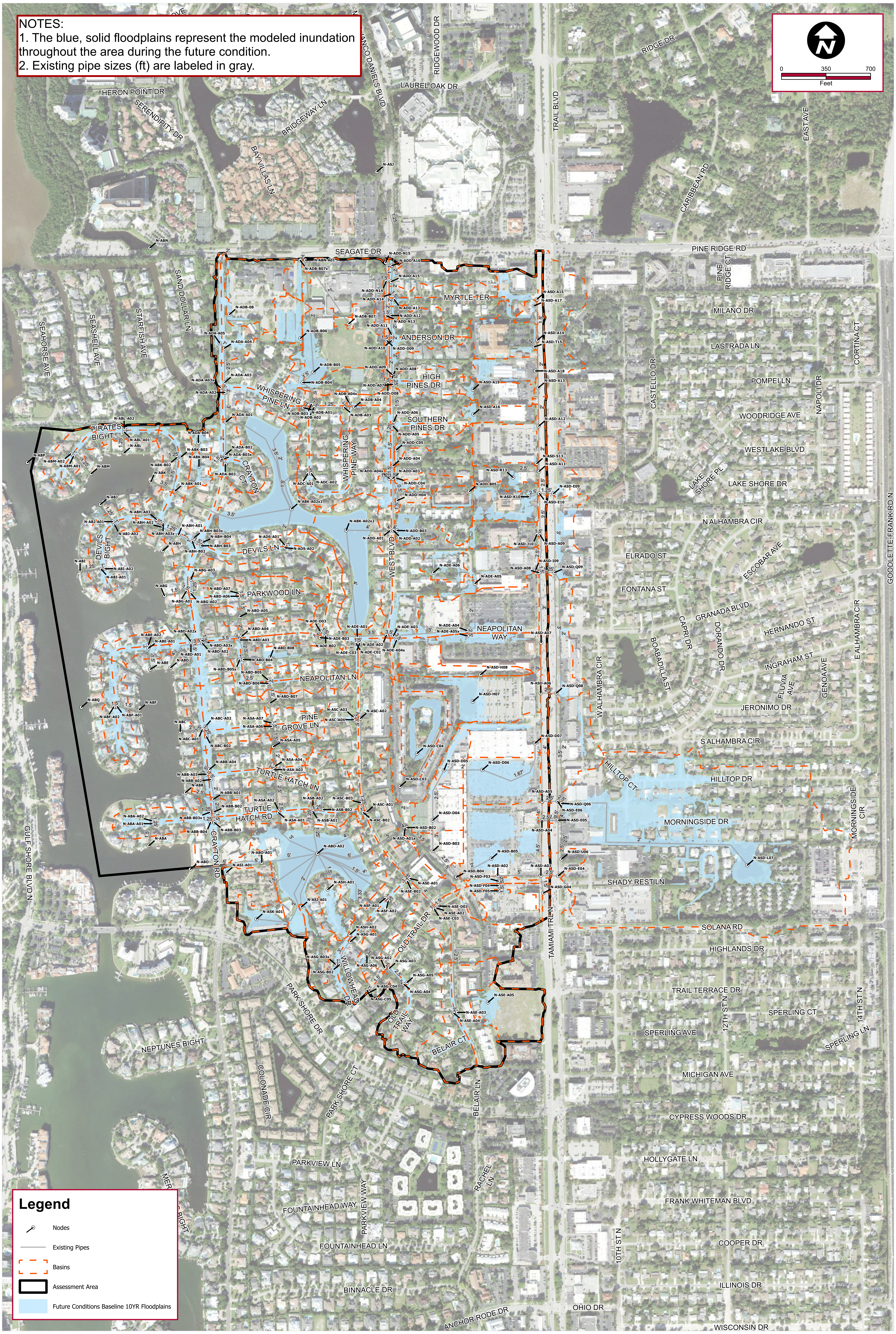
Baseline Future Conditions



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AREA A
FUTURE CONDITIONS
BASELINE
10YR MODEL RESULTS

FIGURE
03-A-10

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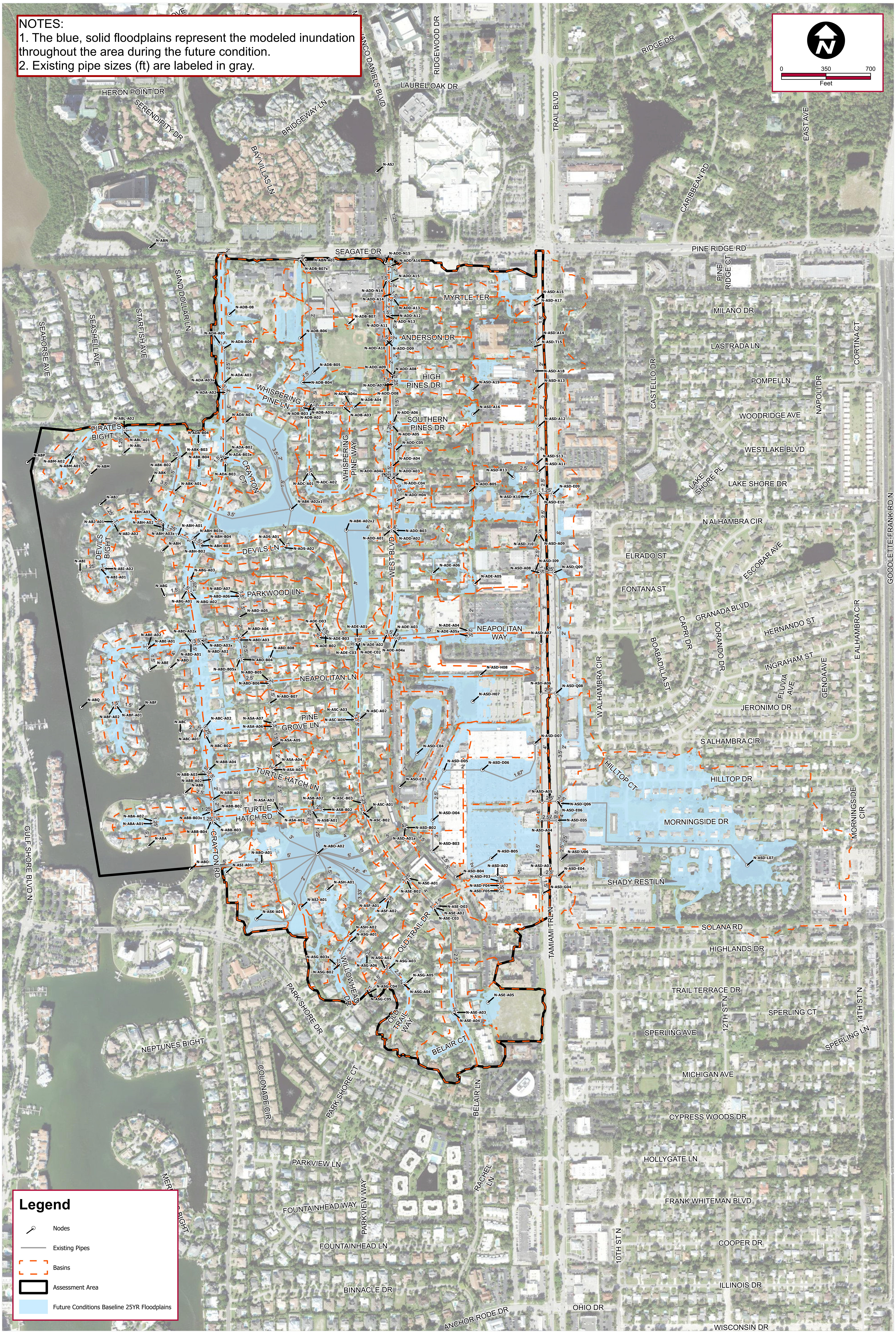

Legend

- Nodes
- Existing Pipes
- Basins
- Assessment Area
- Future Conditions Baseline 25YR Floodplains

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AREA A
FUTURE CONDITIONS
BASELINE
25YR MODEL RESULTS

FIGURE
03-A-25

NOTES:
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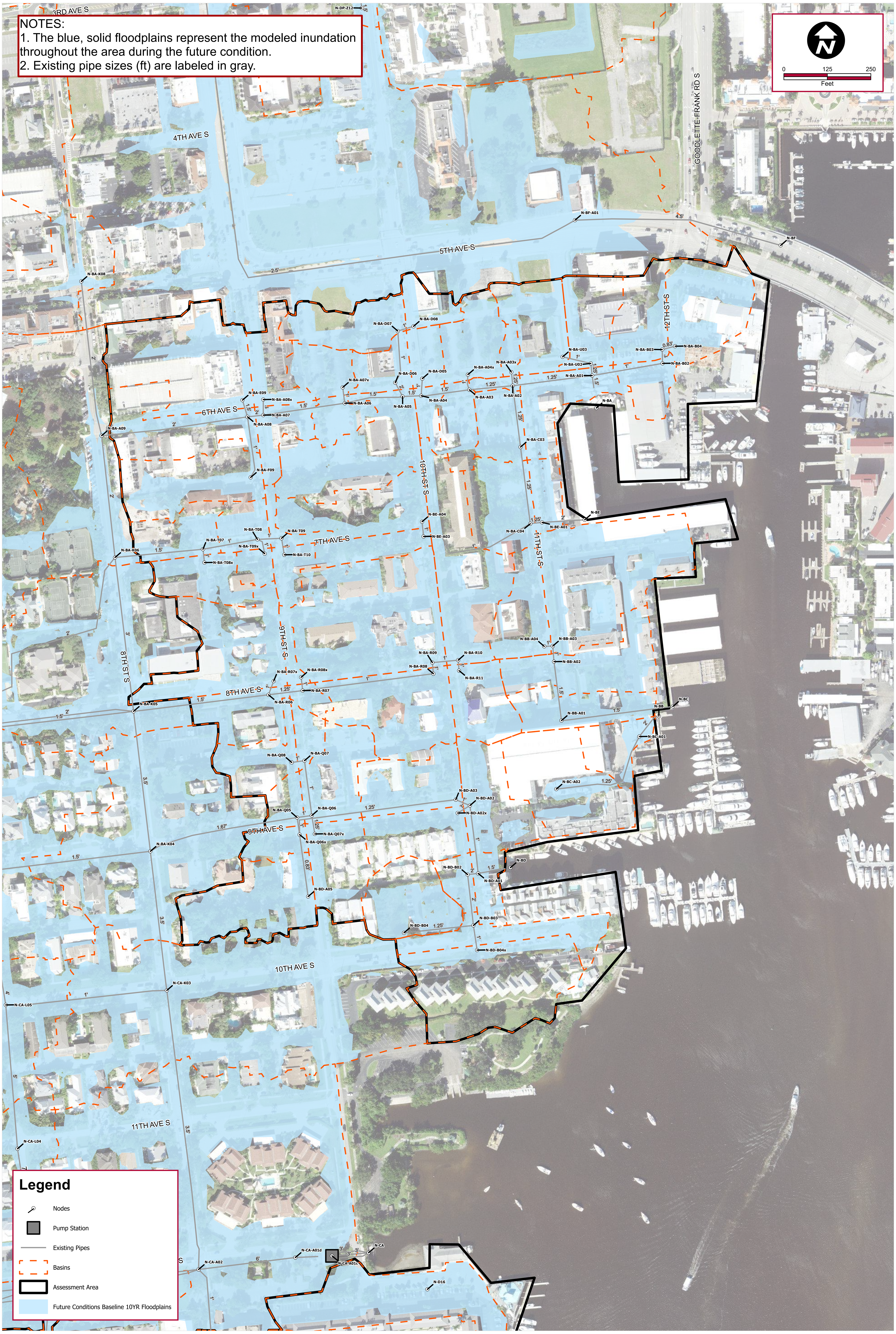

Legend

- Nodes
- Pump Station
- Existing Pipes
- Basins
- Assessment Area
- Future Conditions Baseline 10YR Floodplains

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AREA B
FUTURE CONDITIONS
BASELINE
10YR MODEL RESULTS

FIGURE
03-B-10

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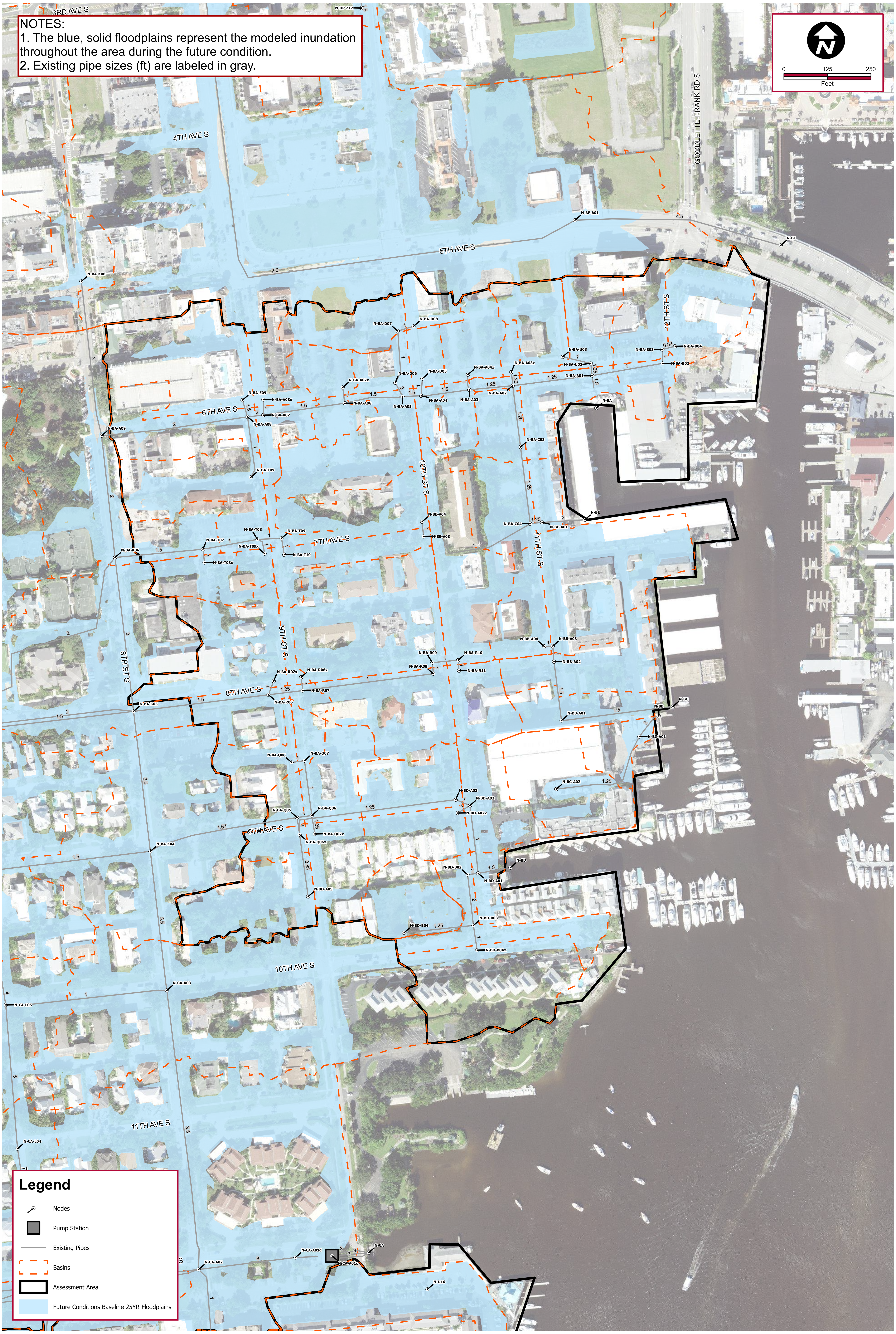

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AREA B
FUTURE CONDITIONS
BASELINE
25YR MODEL RESULTS

FIGURE
03-B-25

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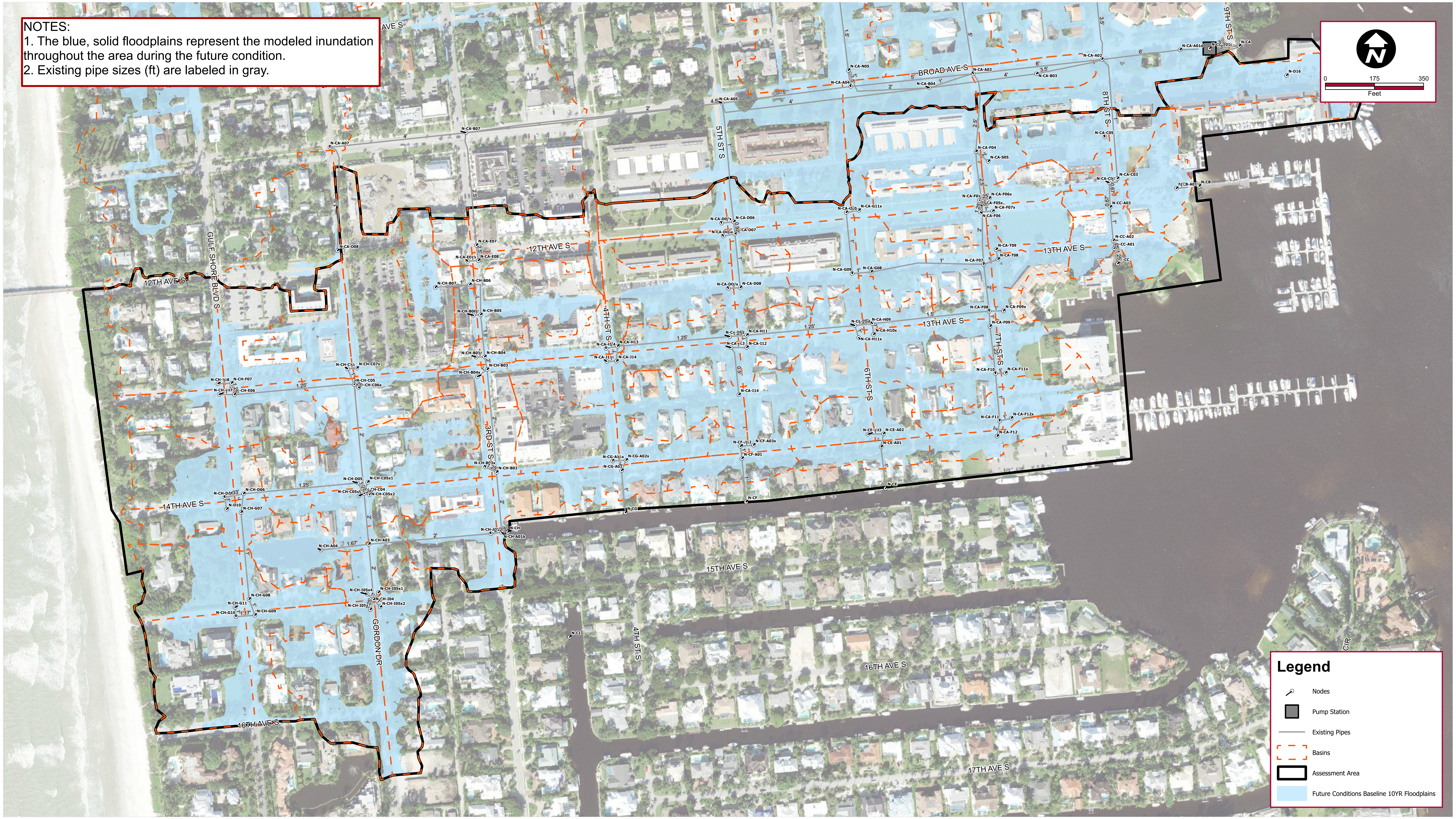

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CITY OF NAPLES

AREA C
FUTURE CONDITIONS
BASELINE
10YR MODEL RESULTS

FIGURE

03-C-10

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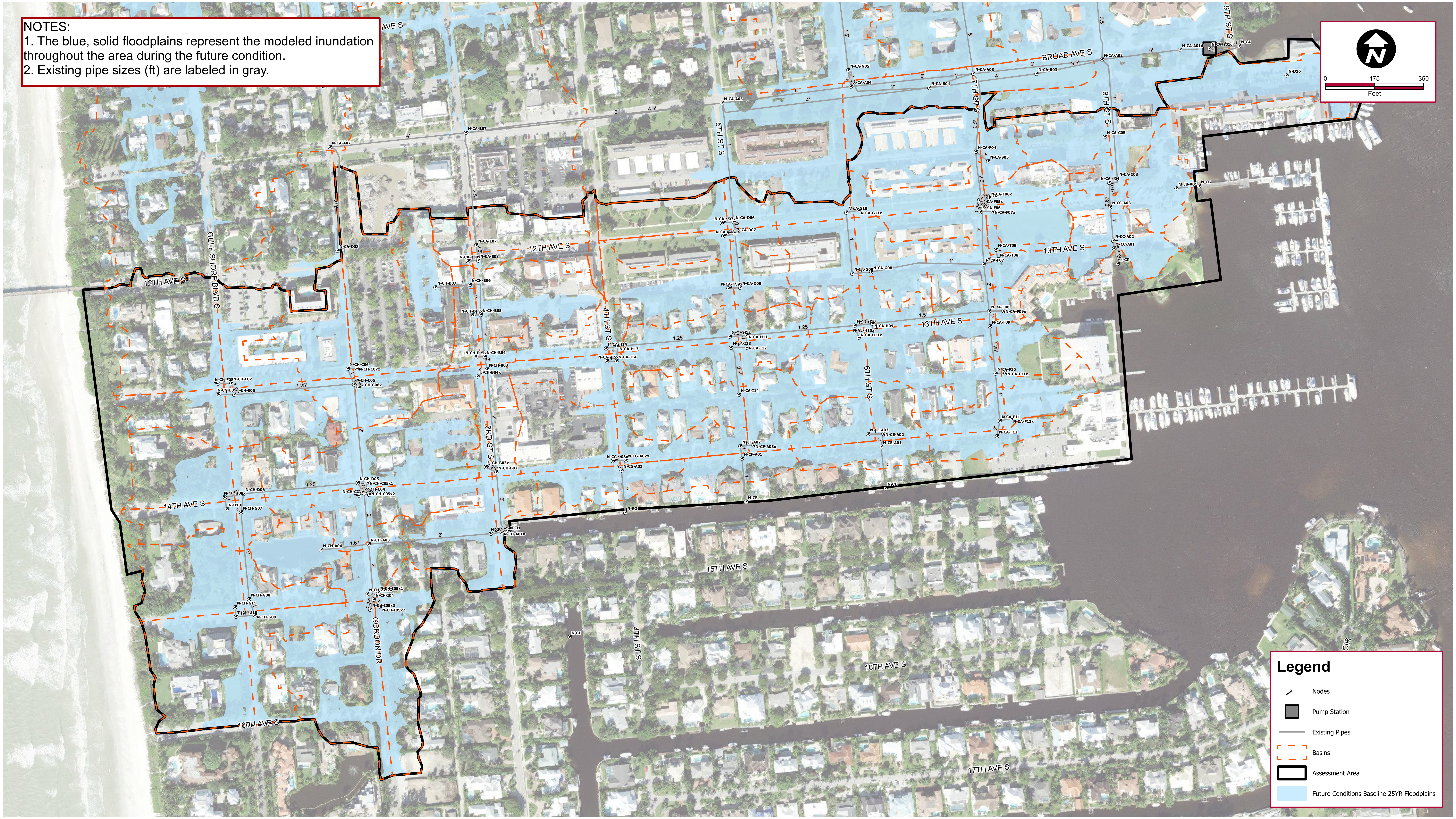

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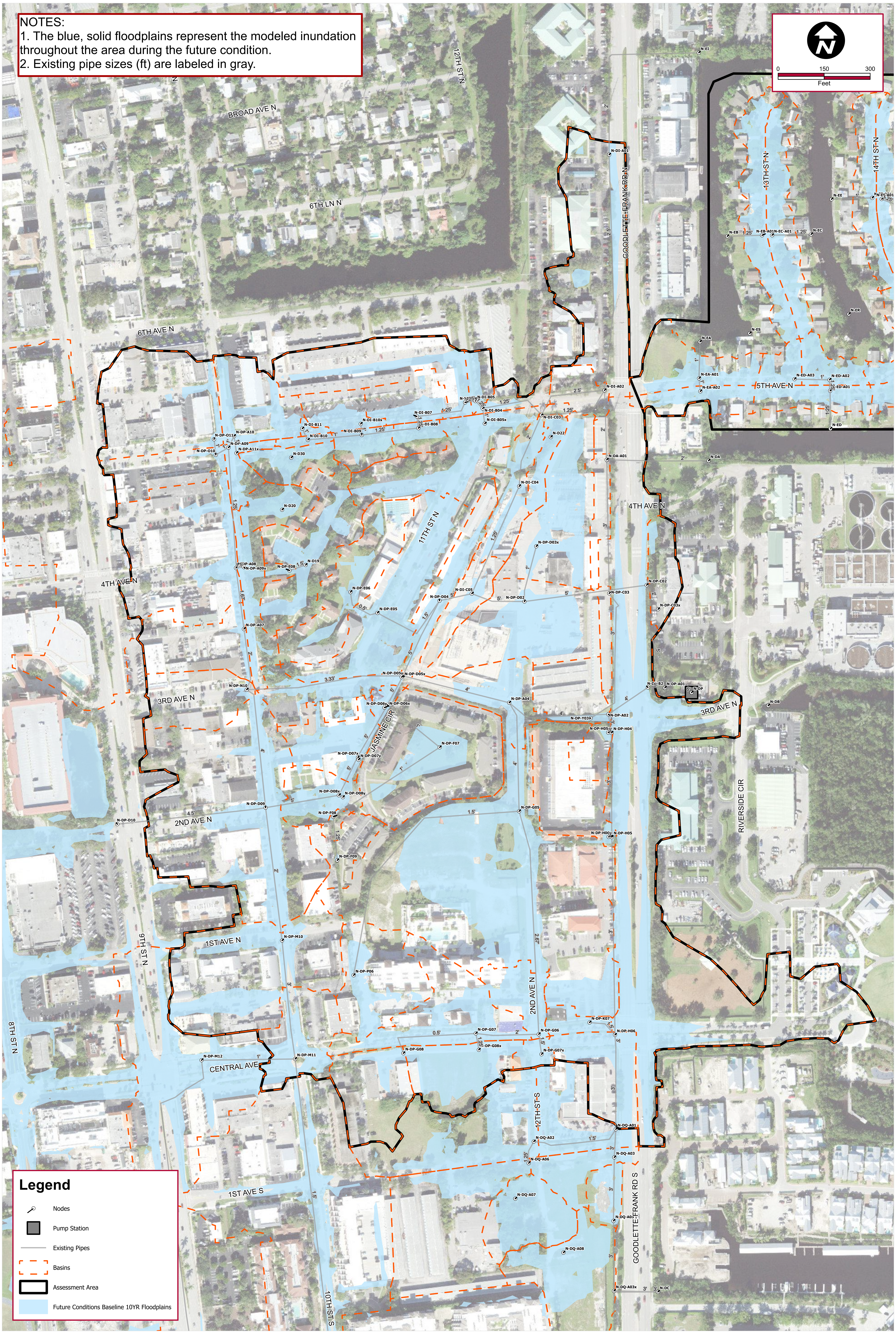
CITY OF NAPLES

AREA C
FUTURE CONDITIONS
BASELINE
25YR MODEL RESULTS

FIGURE

03-C-25

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the future condition.
2. Existing pipe sizes (ft) are labeled in gray.



Legend

- Nodes
- Pump Station
- Existing Pipes
- Basins
- Assessment Area
- Future Conditions Baseline 10YR Floodplains

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\03 Baseline Future Conditions\Baseline FC\Baseline FC.aprx - 11/29/2023 5:26 PM - Henry.Albright

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WWW.KIMLEY-HORN.COM REGISTRY No. 35106

KHA PROJECT 048320007
DATE NOVEMBER 2023
SCALE AS SHOWN
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DRAWN BY KHA
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CITY OF NAPLES FLORIDA

AREA D
FUTURE CONDITIONS
BASELINE
10YR MODEL RESULTS

FIGURE
03-D-10

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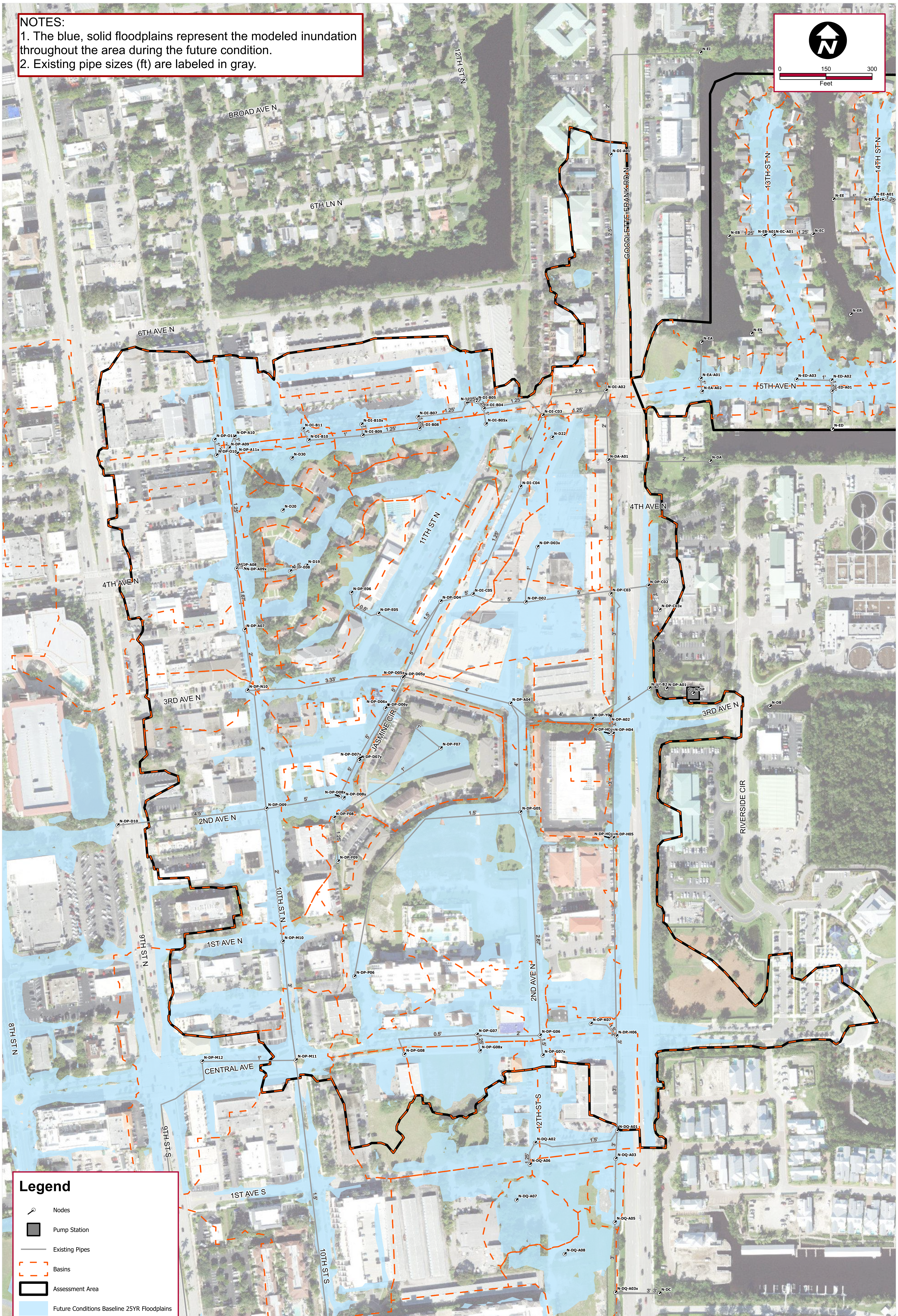

Legend

- Nodes
- Pump Station
- Existing Pipes
- Basins
- Assessment Area
- Future Conditions Baseline 25YR Floodplains

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AREA D FUTURE CONDITIONS BASELINE 25YR MODEL RESULTS

FIGURE
03-D-25

NOTES:
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AREA E
FUTURE CONDITIONS
BASELINE
10YR MODEL RESULTS

FIGURE
03-E-10

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CITY OF NAPLES

AREA E
FUTURE CONDITIONS
BASELINE
25YR MODEL RESULTS

FIGURE

03-E-25

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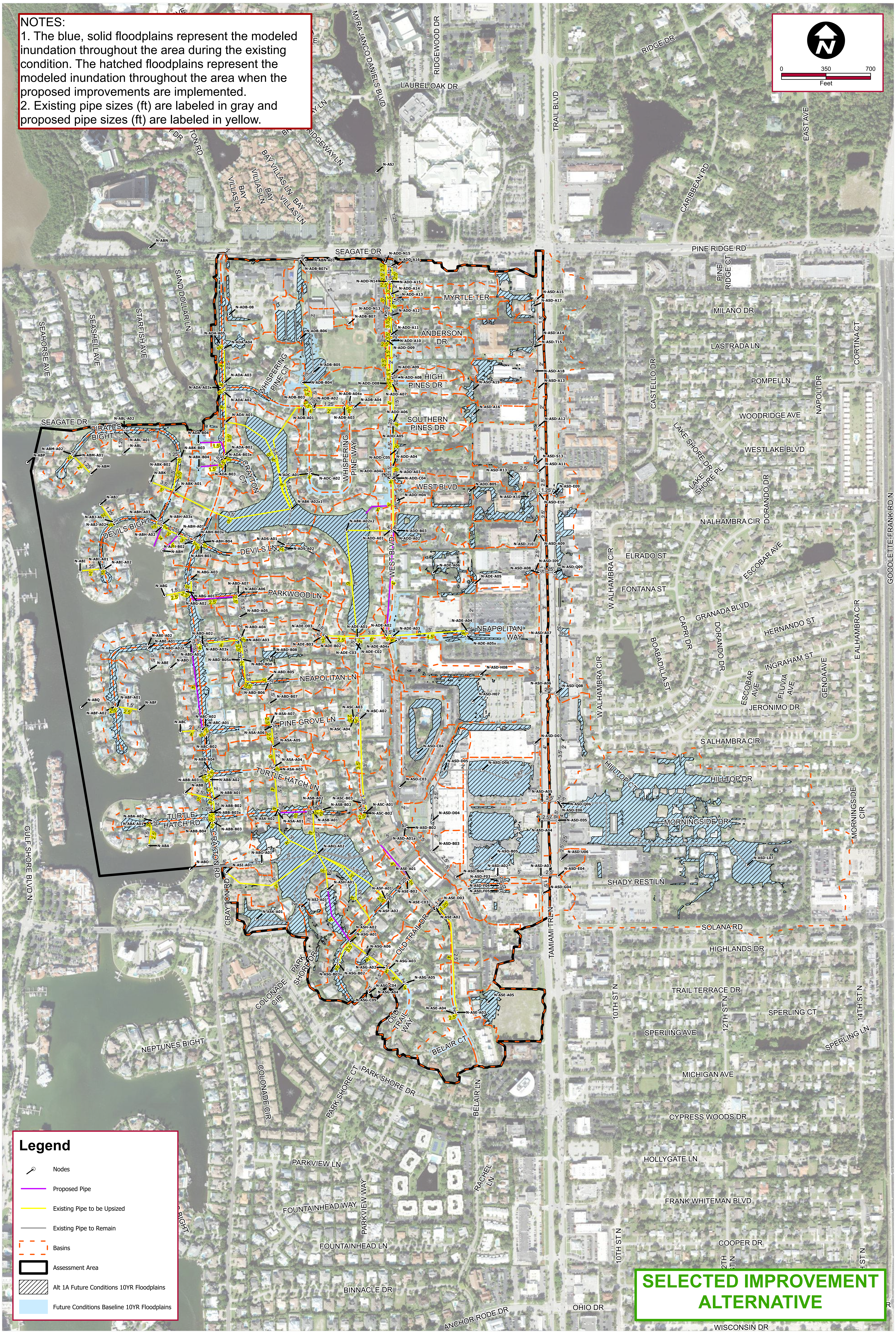
Improvement Alternatives with Future Condition Tailwater



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Legend
- Nodes
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 1A Future Conditions 10YR Floodplains
- Future Conditions Baseline 10YR Floodplains

SELECTED IMPROVEMENT ALTERNATIVE

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CITY OF NAPLES FLORIDA

IMPROVEMENT ALT 1A
UPSIZE AND ADD PIPES
10 YEAR MODEL RESULTS
FUTURE CONDITIONS
TAILWATER

EXHIBIT
04-1A-10

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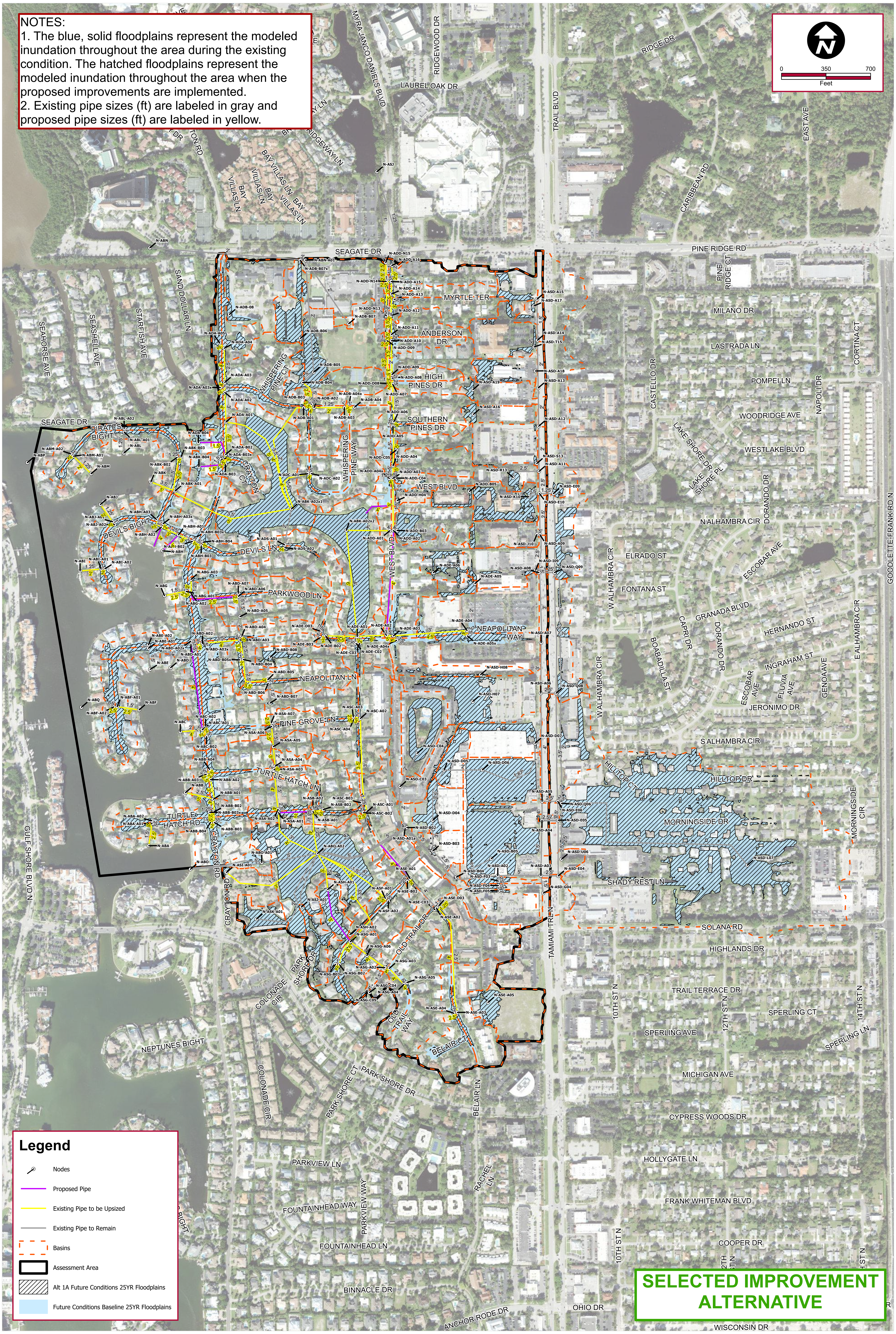

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CITY OF NAPLES FLORIDA

IMPROVEMENT ALT 1A
UPSIZE AND ADD PIPES
25 YEAR MODEL RESULTS
FUTURE CONDITIONS
TAILWATER

EXHIBIT
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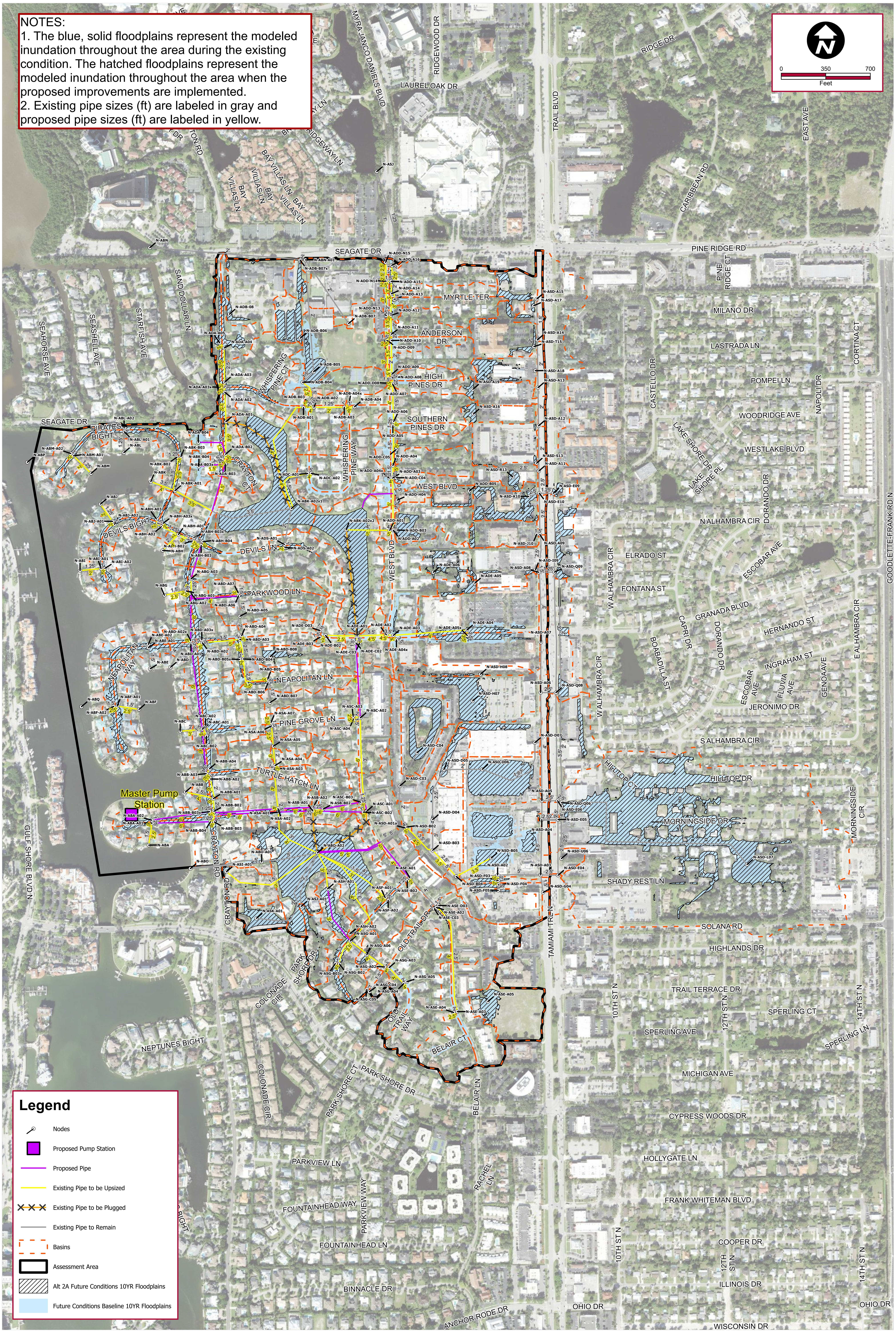

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IMPROVEMENT ALT 2A
MASTER PUMP STATION
10 YEAR MODEL RESULTS
FUTURE CONDITIONS
TAILWATER

EXHIBIT
04-2A-10

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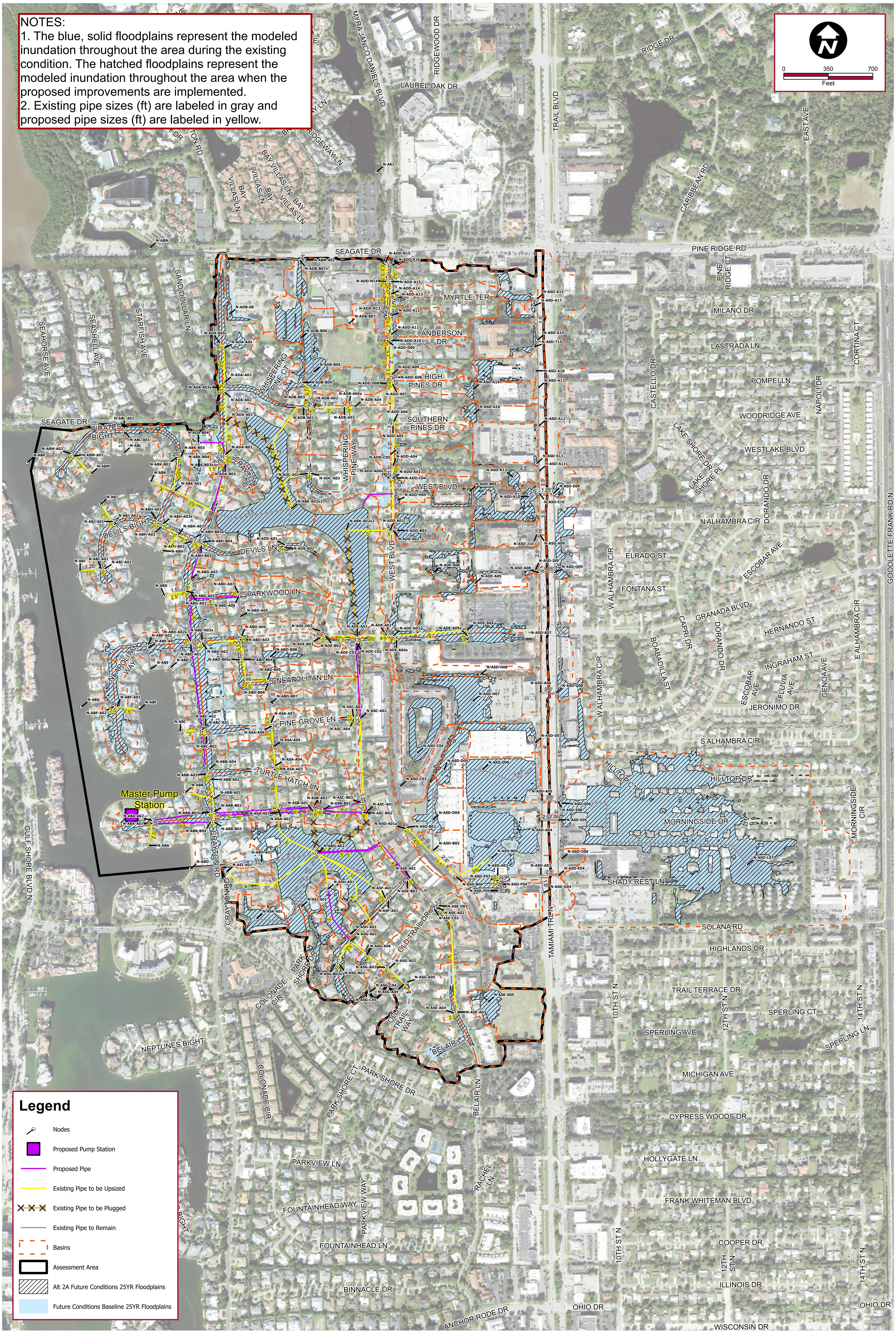

Legend

- Nodes
- Proposed Pump Station
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to be Plugged
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 2A Future Conditions 25YR Floodplains
- Future Conditions Baseline 25YR Floodplains

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IMPROVEMENT ALT 2A
MASTER PUMP STATION
25 YEAR MODEL RESULTS
FUTURE CONDITIONS
TAILWATER

EXHIBIT
04-2A-25

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IMPROVEMENT ALT 2B
NAPLES BAY
PUMP STATIONS
10 YEAR MODEL RESULTS
FUTURE CONDITIONS
TAILWATER

FIGURE
04-2B-10

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CITY OF NAPLES FLORIDA

IMPROVEMENT ALT 2B
NAPLES BAY
PUMP STATIONS
25 YEAR MODEL RESULTS
FUTURE CONDITIONS
TAILWATER

FIGURE
04-2B-25

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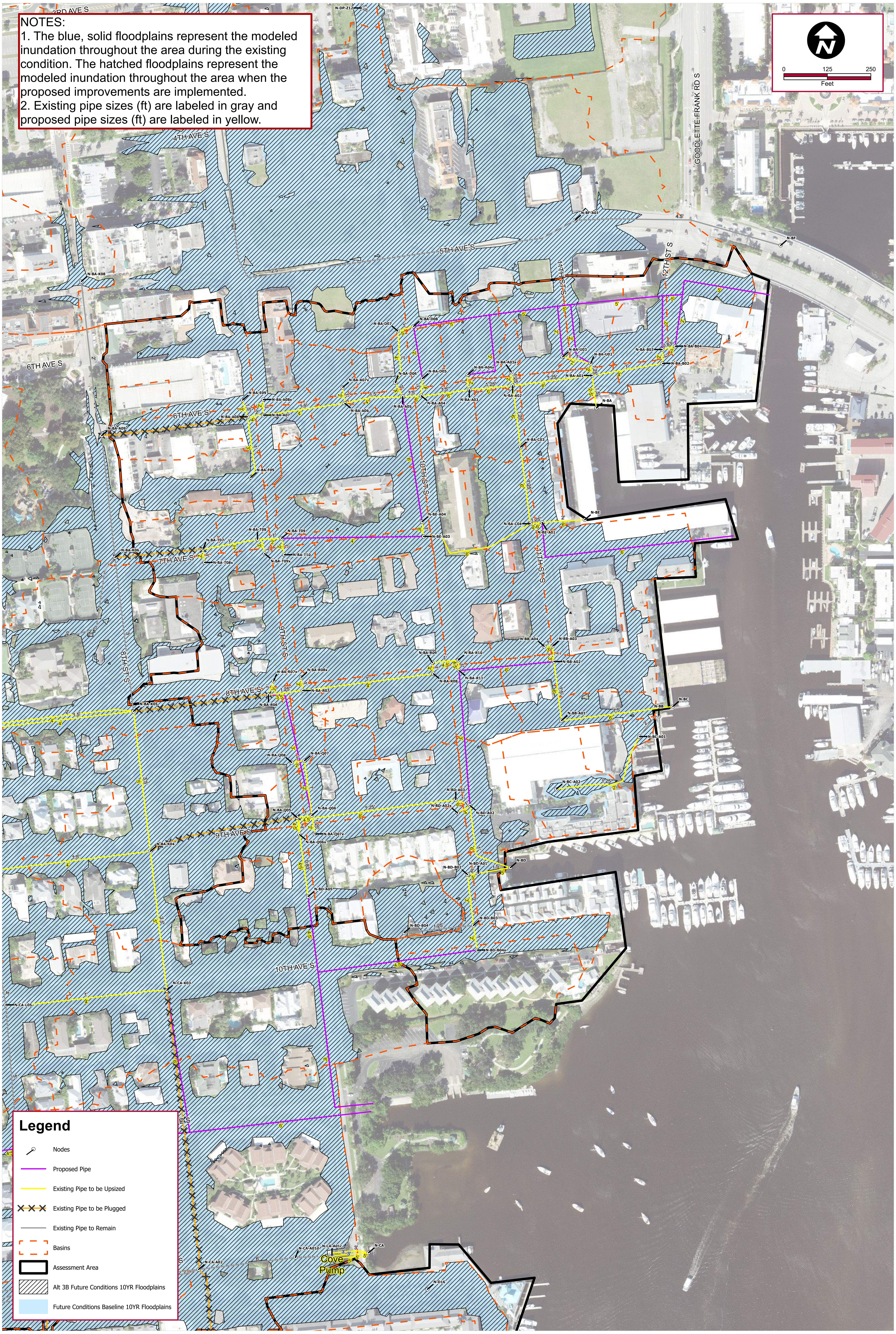

Legend

- Nodes
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to be Plugged
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 3B Future Conditions 10YR Floodplains
- Future Conditions Baseline 10YR Floodplains

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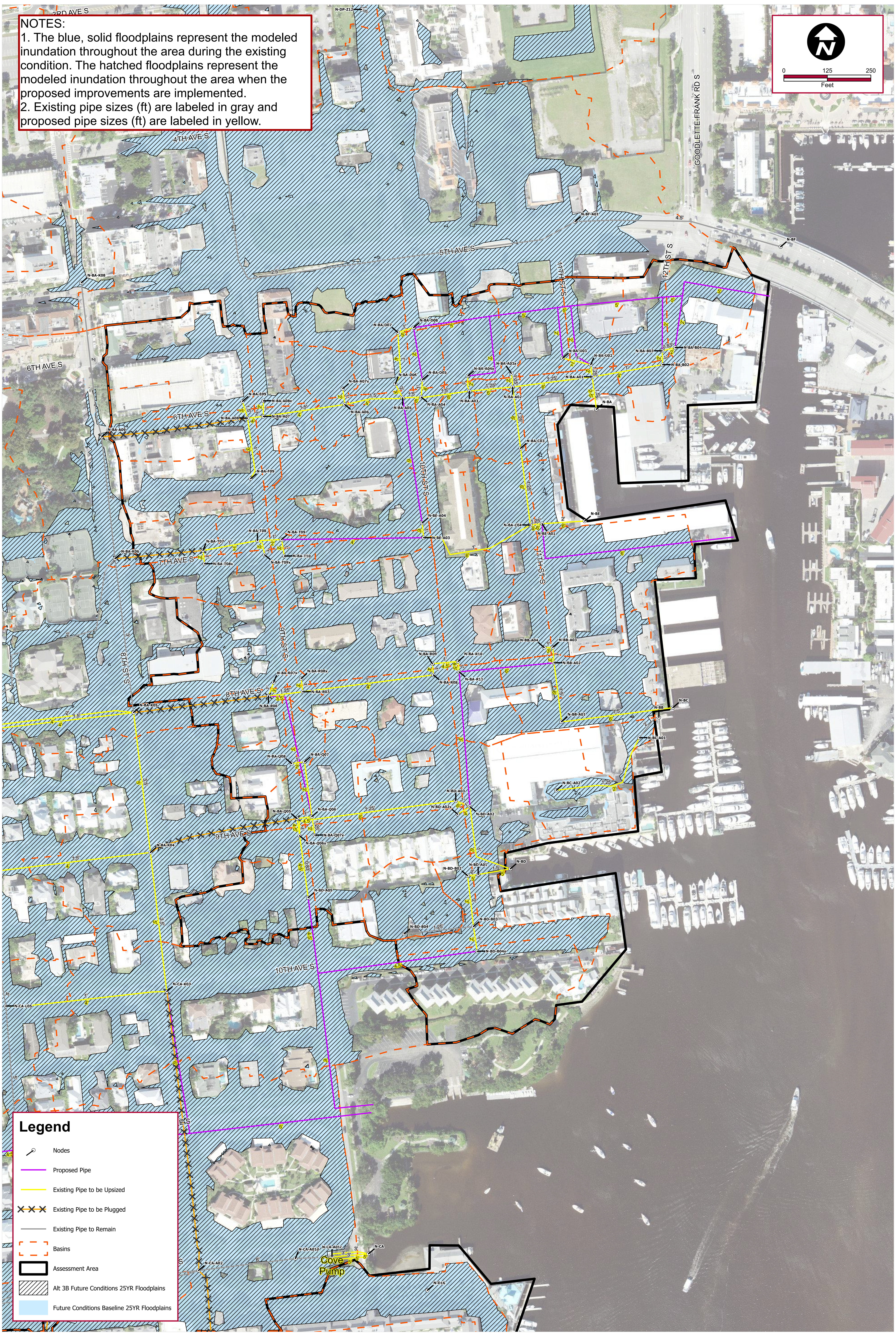
CITY OF NAPLES FLORIDA

IMPROVEMENT ALT 3B PIPES UPSIZED WITH NEW CONNECTIONS 10 YEAR MODEL RESULTS FUTURE CONDITIONS TAILWATER

FIGURE
04-3B-10

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\04 Improvement Alts with FC Tailwater\Improvement Alternatives FC\Improvement Alternatives FC.aprx - 11/29/2023 5:27 PM - Henry.Albright



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CITY OF NAPLES FLORIDA

IMPROVEMENT ALT 3B
PIPES UPSIZED WITH
NEW CONNECTIONS
25 YEAR MODEL RESULTS
FUTURE CONDITIONS
TAILWATER

FIGURE
04-3B-25

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\04 Improvement Alts with FC Tailwater\Improvement Alternatives FC\Improvement Alternatives FC.aprx - 11/29/2023 5:27 PM - Henry.Albright

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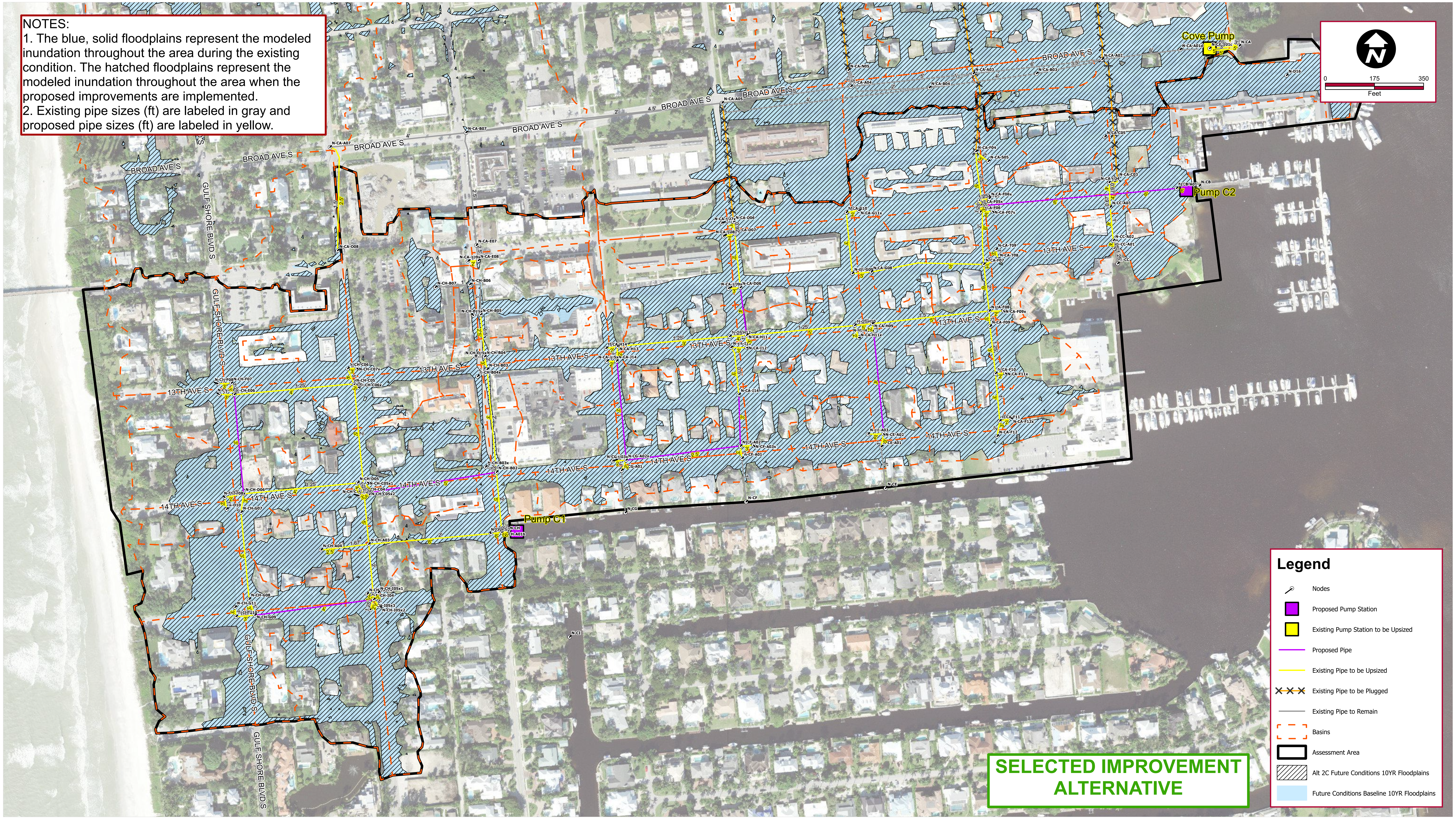

SELECTED IMPROVEMENT ALTERNATIVE

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CITY OF NAPLES

IMPROVEMENT ALT 2C
MASTER PUMP STATIONS
10 YEAR MODEL RESULTS
FUTURE CONDITIONS TAILWATER

FIGURE
04-2C-10

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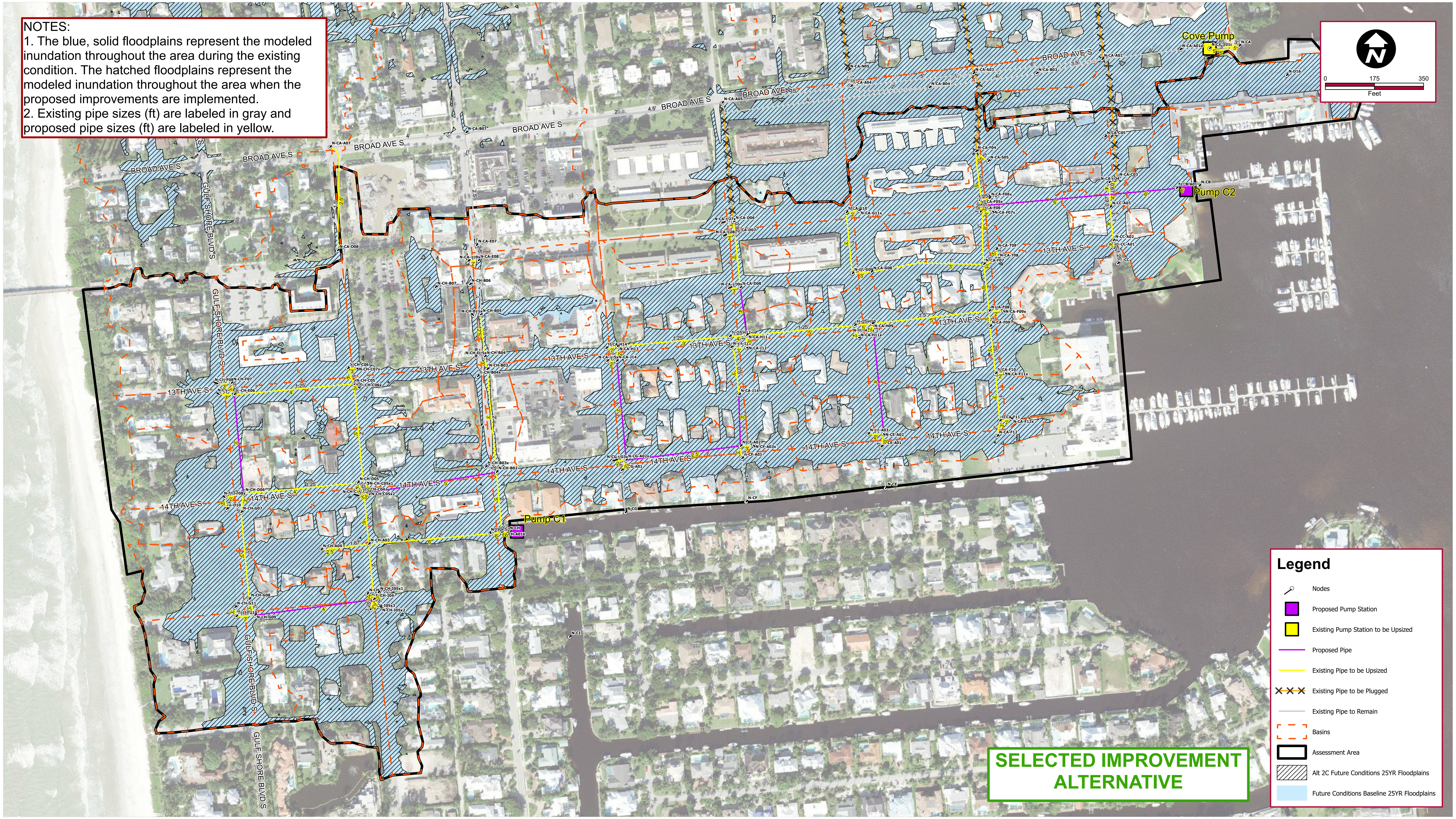

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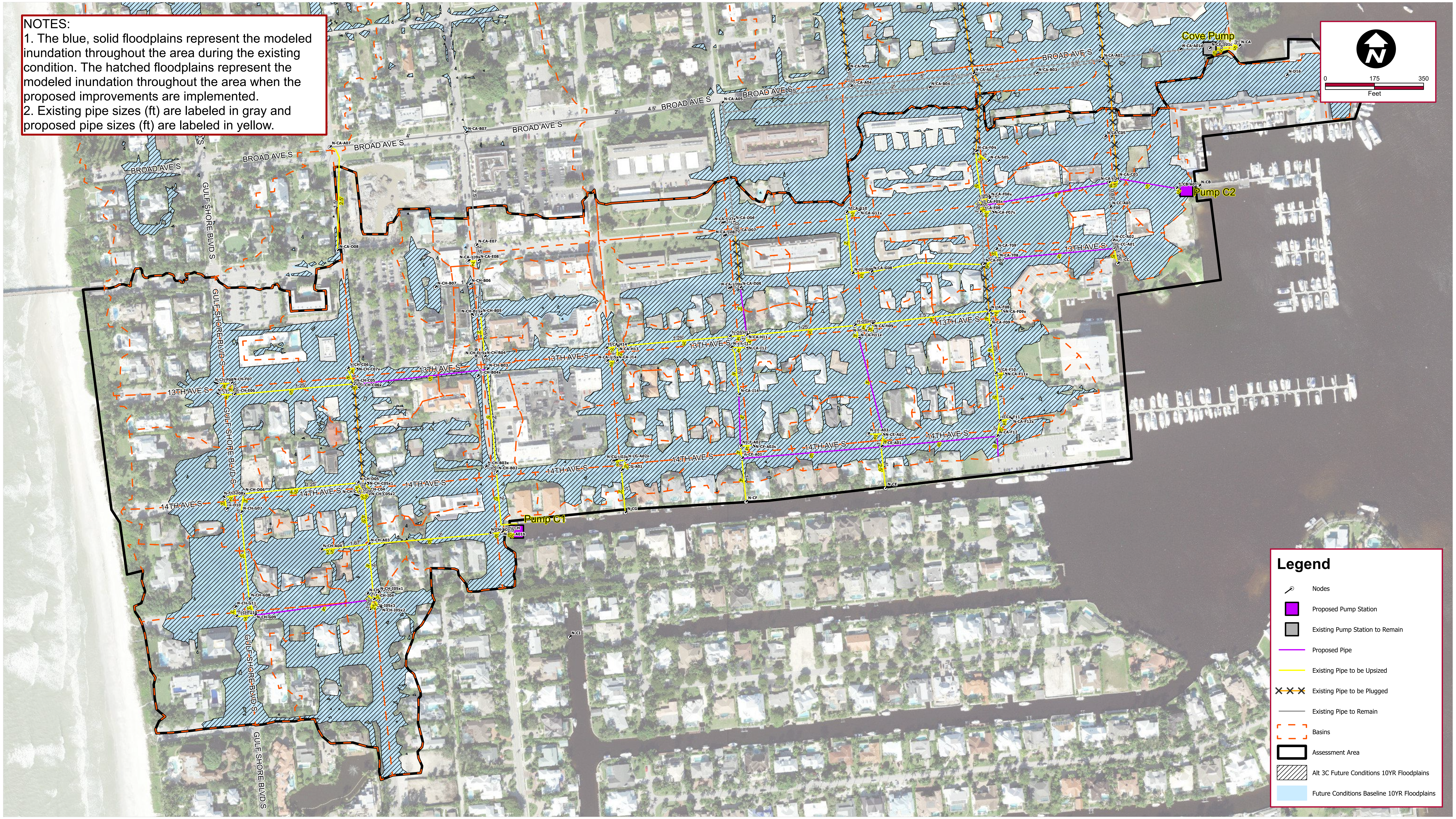
CITY OF NAPLES

IMPROVEMENT ALT 2C
MASTER PUMP STATIONS
25 YEAR MODEL RESULTS
FUTURE CONDITIONS TAILWATER

FIGURE

04-2C-25



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CITY OF NAPLES

IMPROVEMENT ALT 3C
PUMP STATIONS AND
GRAVITY OUTFALLS
10 YEAR MODEL RESULTS
FUTURE CONDITIONS TAILWATER

FIGURE

04-3C-10

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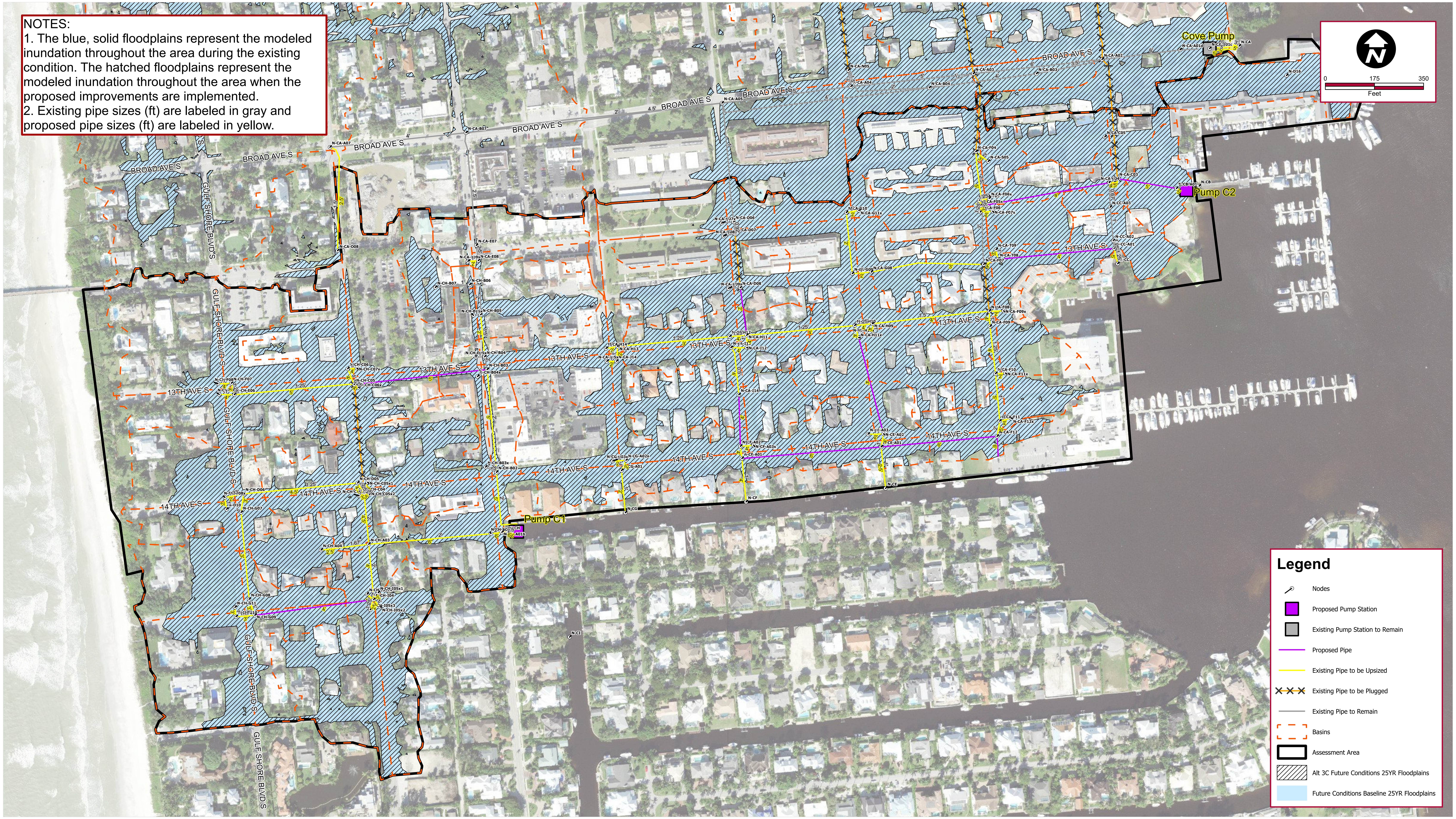

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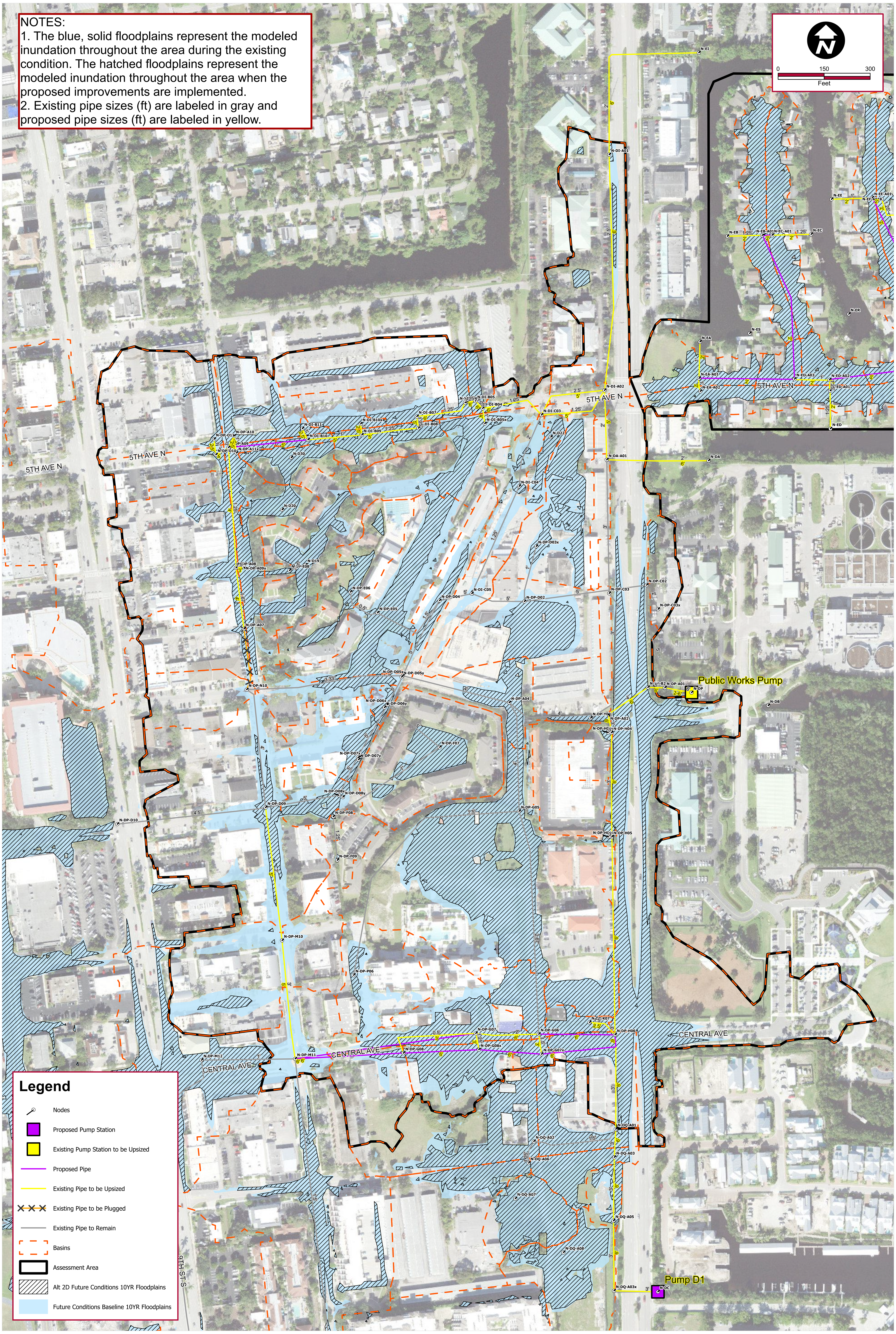
IMPROVEMENT ALT 3C
PUMP STATIONS AND
GRAVITY OUTFALLS
25 YEAR MODEL RESULTS
FUTURE CONDITIONS TAILWATER

FIGURE

04-3C-25



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CITY OF NAPLES FLORIDA

IMPROVEMENT ALT 2D
UPSIZE PIPES AND
ADD PUMP
10 YEAR MODEL RESULTS
FUTURE CONDITIONS
TAILWATER

FIGURE
04-2D-10

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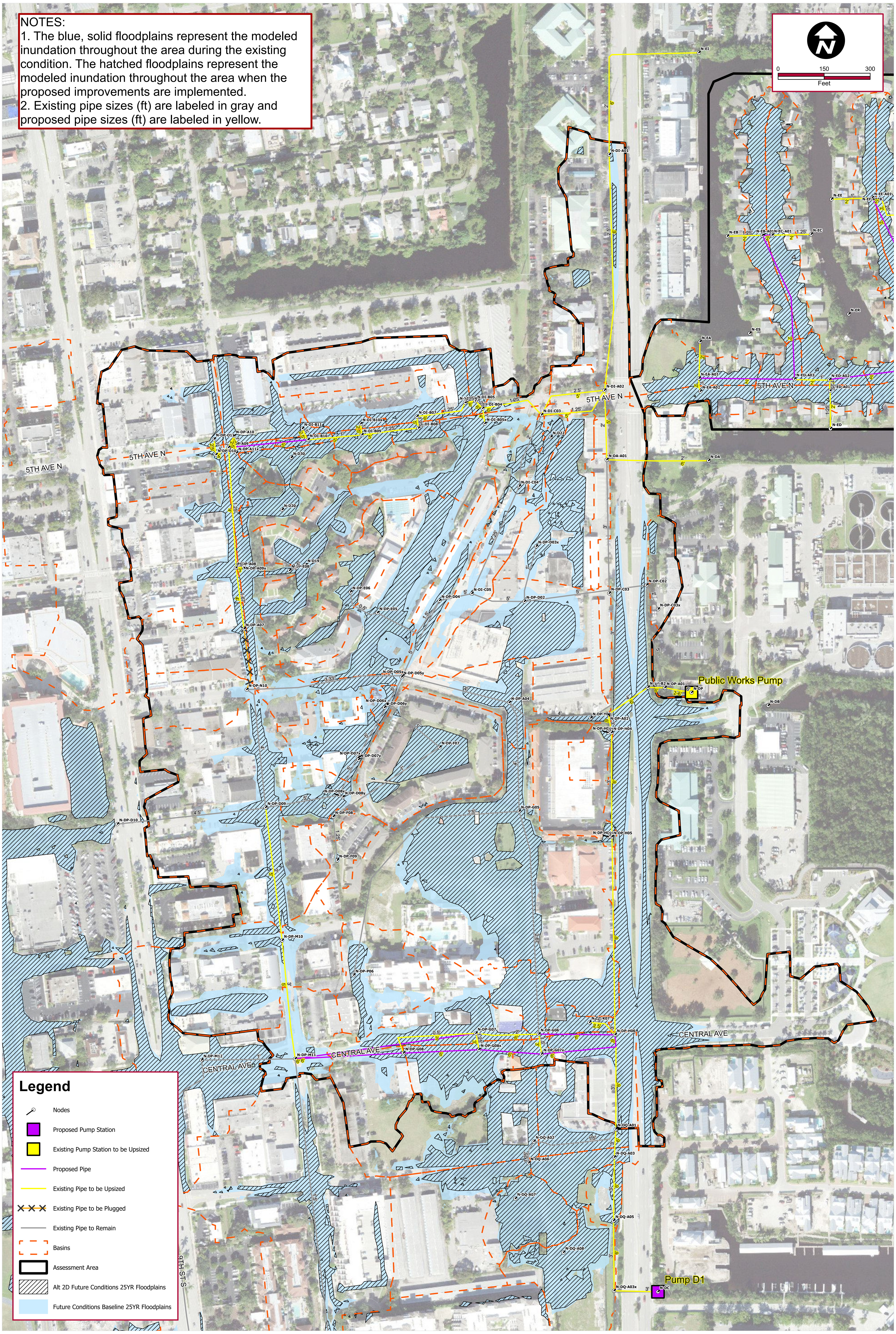

Legend

- Nodes
- Proposed Pump Station
- Existing Pump Station to be Upsized
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to be Plugged
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 2D Future Conditions 25YR Floodplains
- Future Conditions Baseline 25YR Floodplains

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IMPROVEMENT ALT 2D
UPSIZE PIPES AND
ADD PUMP
25 YEAR MODEL RESULTS
FUTURE CONDITIONS
TAILWATER

FIGURE
04-2D-25

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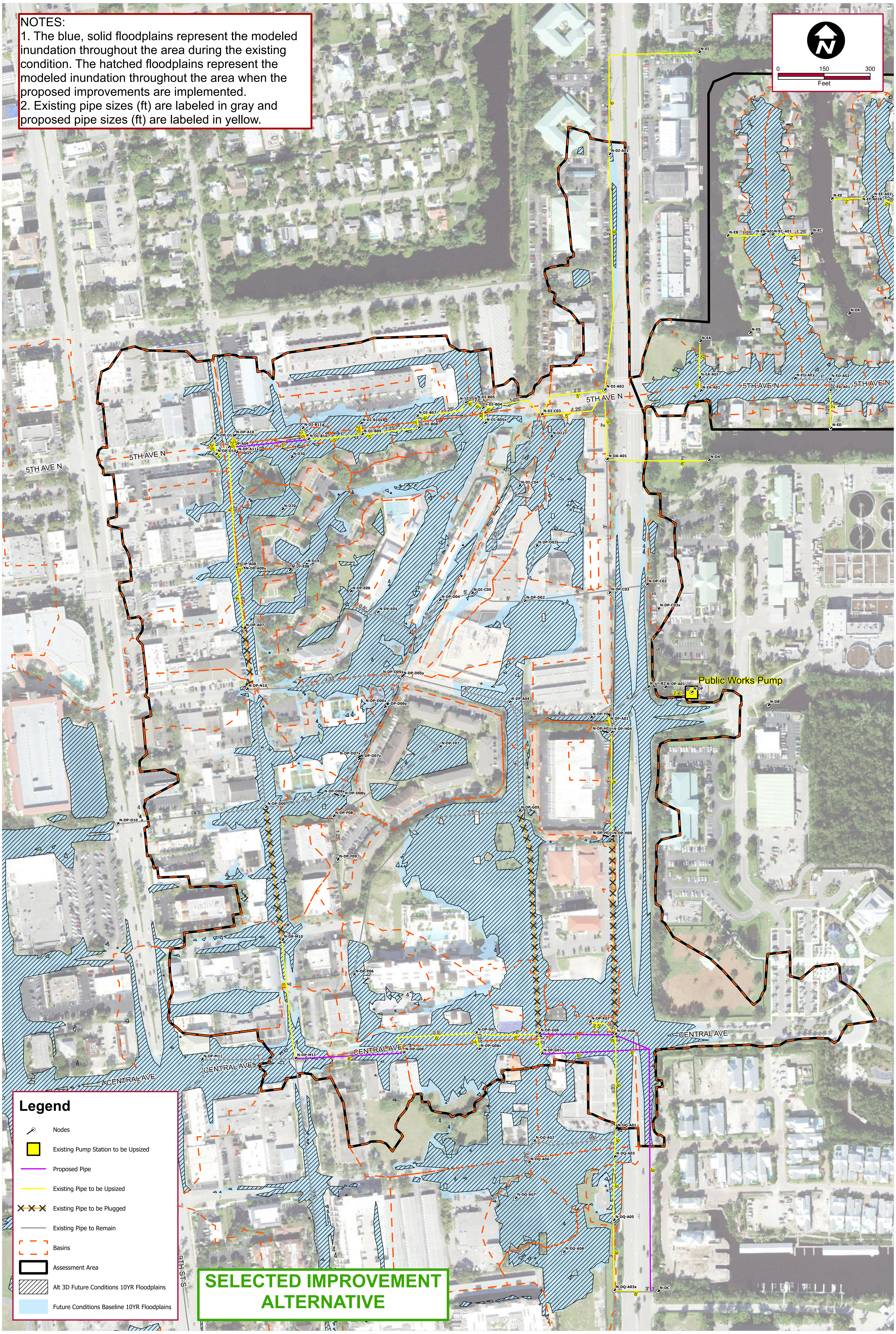

Legend

- Nodes
- Existing Pump Station to be Upsized
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to be Plugged
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 3D Future Conditions 10YR Floodplains
- Future Conditions Baseline 10YR Floodplains

SELECTED IMPROVEMENT ALTERNATIVE

No.	REVISIONS	DATE	BY

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1514 BROADWAY, SUITE 301, FORT MYERS, FL 33901
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KHA PROJECT 048320007
DATE NOVEMBER 2023
SCALE AS SHOWN
DESIGNED BY KHA
DRAWN BY KHA
CHECKED BY KHA

BASINS ASSESSMENT
PREPARED FOR
CITY OF NAPLES

CITY OF NAPLES FLORIDA

IMPROVEMENT ALT 3D
FULLY DISCONNECT
FROM PUBLIC WORKS PUMP
10 YEAR MODEL RESULTS
FUTURE CONDITIONS TAILWATER

FIGURE
04-3D-10

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\04 Improvement Alts with FC Tailwater\Improvement Alternatives FC\Improvement Alternatives FC.aprx - 11/29/2023 5:13 PM - Henry.Albright

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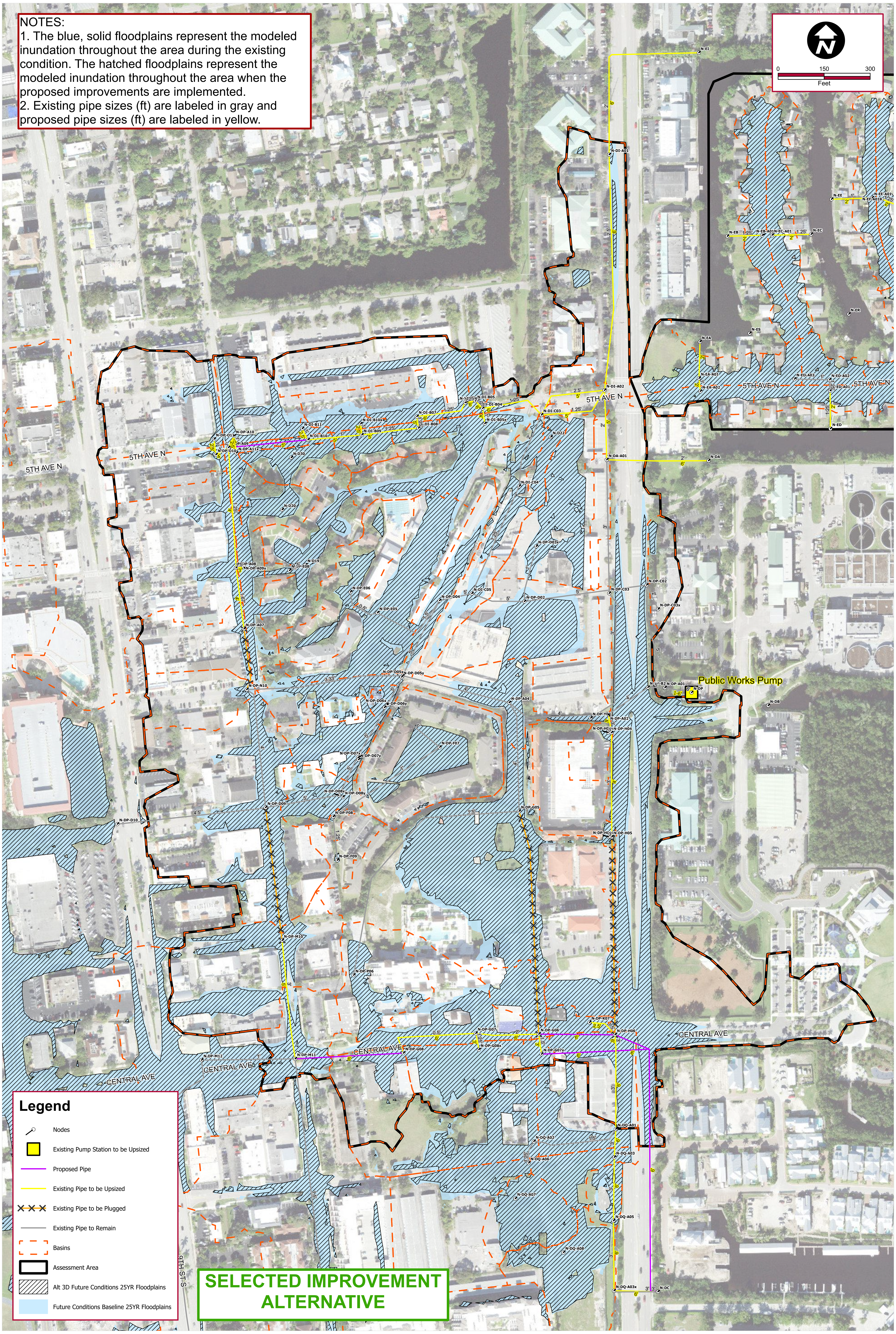

Legend

- Nodes
- Existing Pump Station to be Upsized
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to be Plugged
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 3D Future Conditions 25YR Floodplains
- Future Conditions Baseline 25YR Floodplains

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\04 Improvement Alts with FC Tailwater\Improvement Alternatives FC\Improvement Alternatives FC.aprx - 11/29/2023 5:26 PM - Henry.Albright

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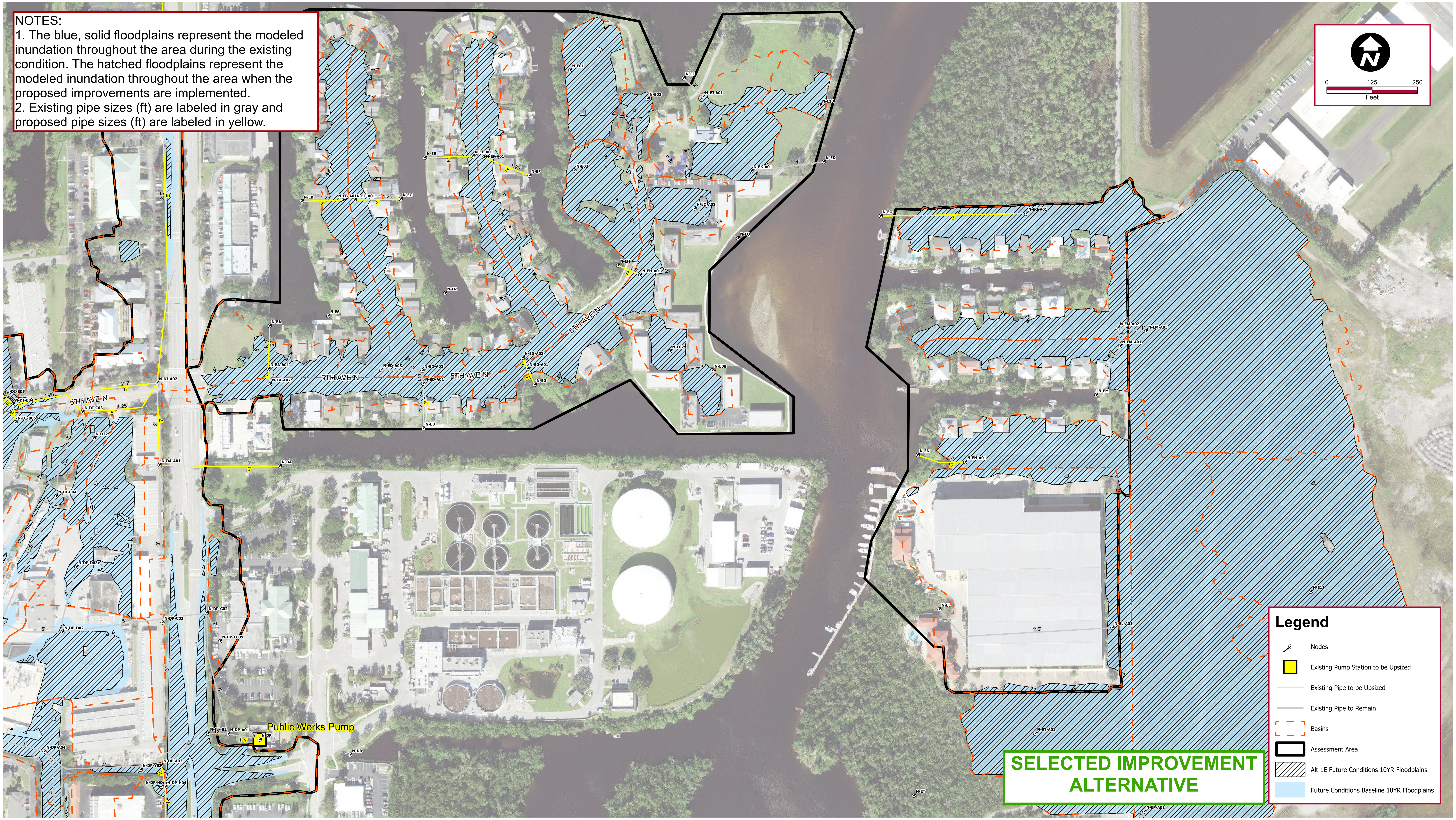
CITY OF NAPLES FLORIDA

IMPROVEMENT ALT 3D
FULLY DISCONNECT
FROM PUBLIC WORKS PUMP
25 YEAR MODEL RESULTS
FUTURE CONDITOINS TAILWATER

FIGURE
04-3D-25



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Legend

- Nodes
- Existing Pump Station to be Upsized
- Existing Pipe to be Upsized
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 1E Future Conditions 10YR Floodplains
- Future Conditions Baseline 10YR Floodplains

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IMPROVEMENT ALT 1E
UPSIZE PIPES ONLY
10 YEAR MODEL RESULTS
FUTURE CONDITIONS TAILWATER

FIGURE

04-1E-10

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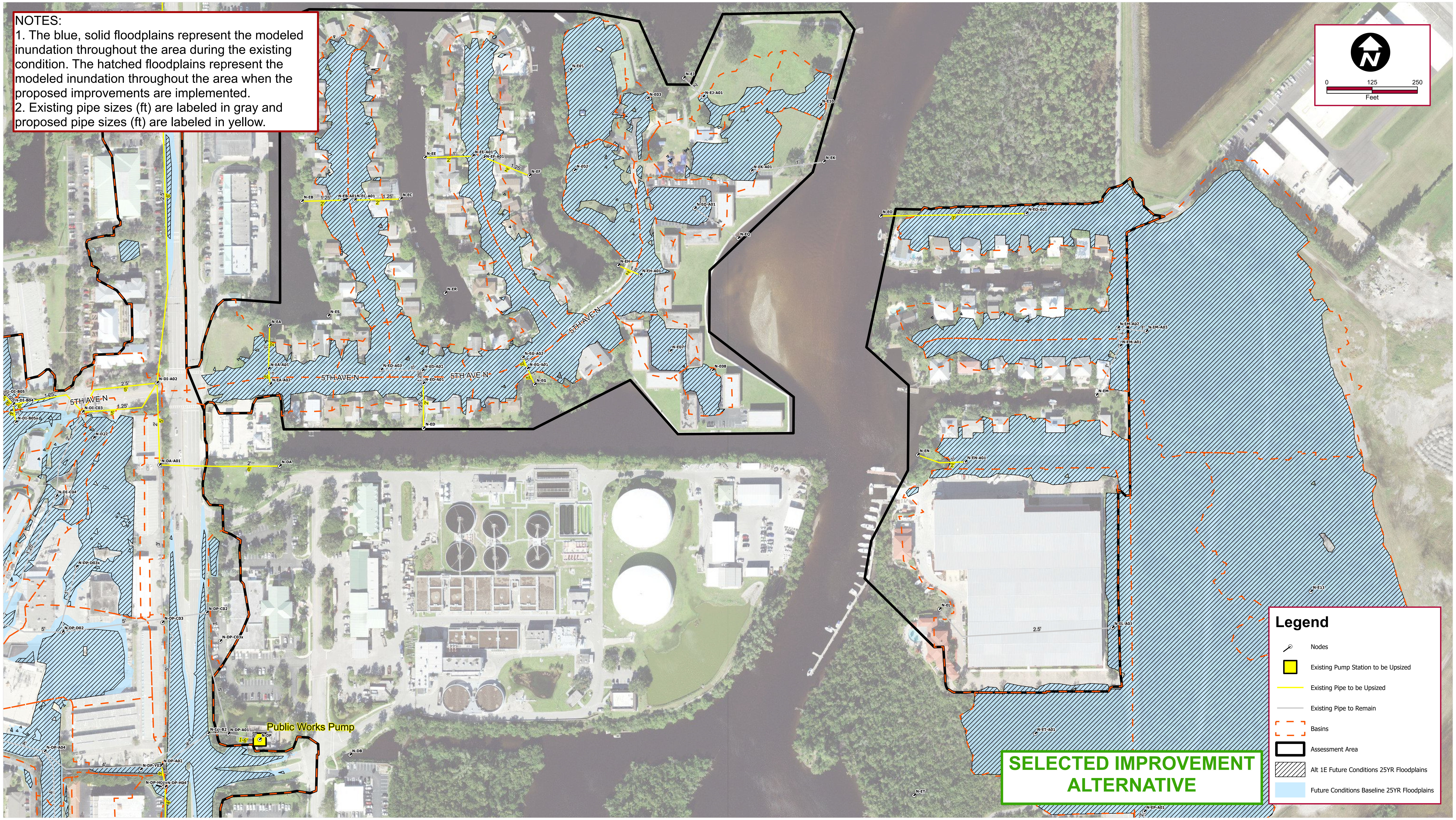

Legend
- Nodes
- Existing Pump Station to be Upsized
- Existing Pipe to be Upsized
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 1E Future Conditions 25YR Floodplains
- Future Conditions Baseline 25YR Floodplains

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IMPROVEMENT ALT 1E
UPSIZE PIPES ONLY
25 YEAR MODEL RESULTS
FUTURE CONDITIONS TAILWATER

FIGURE

04-1E-25

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Legend
- Nodes
- Proposed Pump Station
- Existing Pump Station to be Upsized
- Proposed Pipe
- Existing Pipe to be Upsized
- Existing Pipe to Remain
- Basins
- Assessment Area
- Alt 2E Future Conditions 10YR Floodplains
- Future Conditions Baseline 10YR Floodplains

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IMPROVEMENT ALT 2E
ADD PUMP STATION WITH CONNECTIONS
10 YEAR MODEL RESULTS
FUTURE CONDITIONS TAILWATER

FIGURE
04-2E-10

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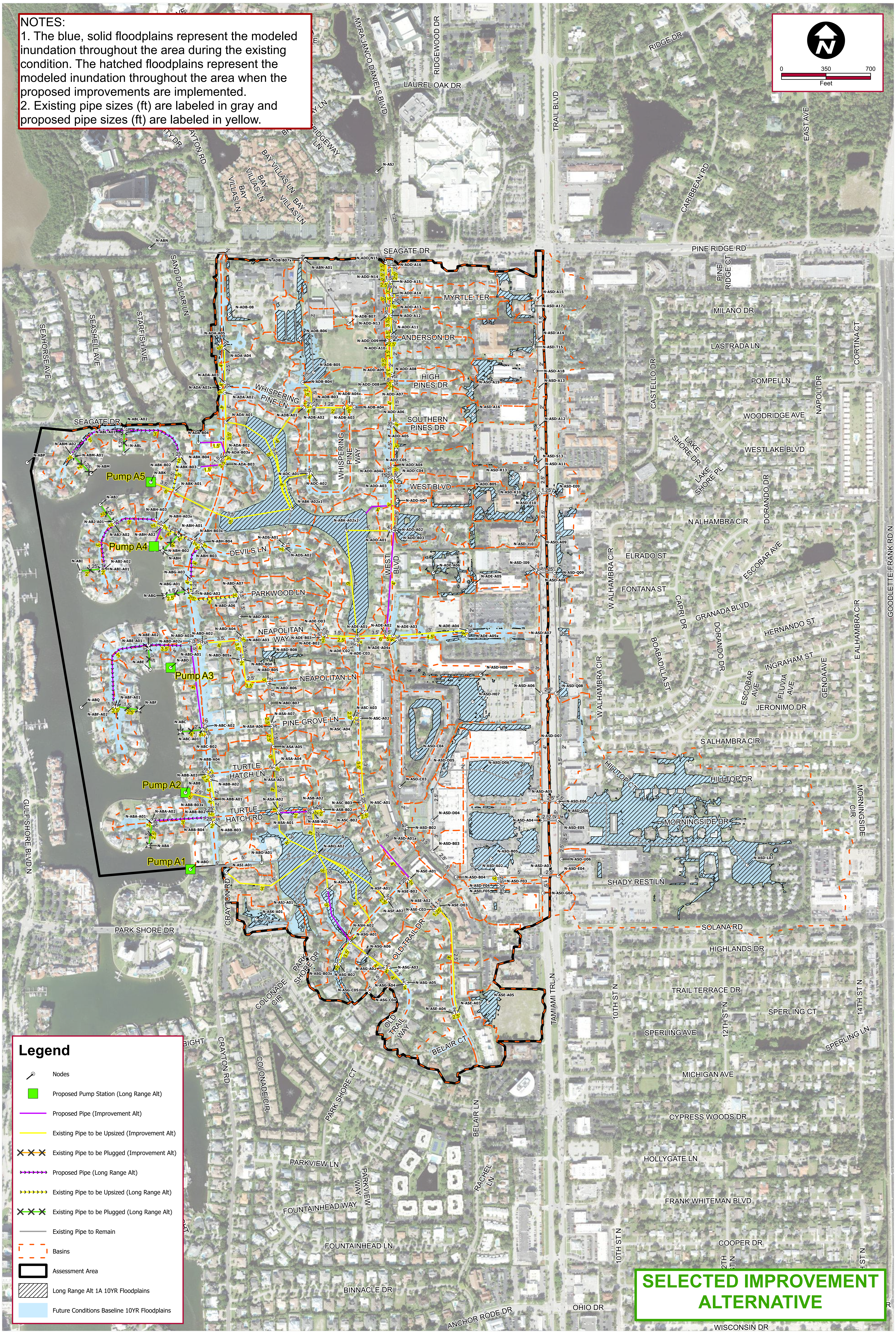
IMPROVEMENT ALT 2E
ADD PUMP STATION WITH CONNECTIONS
25 YEAR MODEL RESULTS
FUTURE CONDITIONS TAILWATER

FIGURE
04-2E-25

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\04 Improvement Alts with FC Tailwater\Improvement Alternatives FC\Improvement Alternatives FC.aprx - 11/29/2023 5:27 PM - Henry.Albright

Long-Range Resilient Alternatives



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0 350 700
Feet

Legend

- Nodes
- Proposed Pump Station (Long Range Alt)
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Proposed Pipe (Long Range Alt)
- Existing Pipe to be Upsized (Long Range Alt)
- Existing Pipe to be Plugged (Long Range Alt)
- Existing Pipe to Remain
- Basins
- Assessment Area
- Long Range Alt 1A 10YR Floodplains
- Future Conditions Baseline 10YR Floodplains

SELECTED IMPROVEMENT ALTERNATIVE

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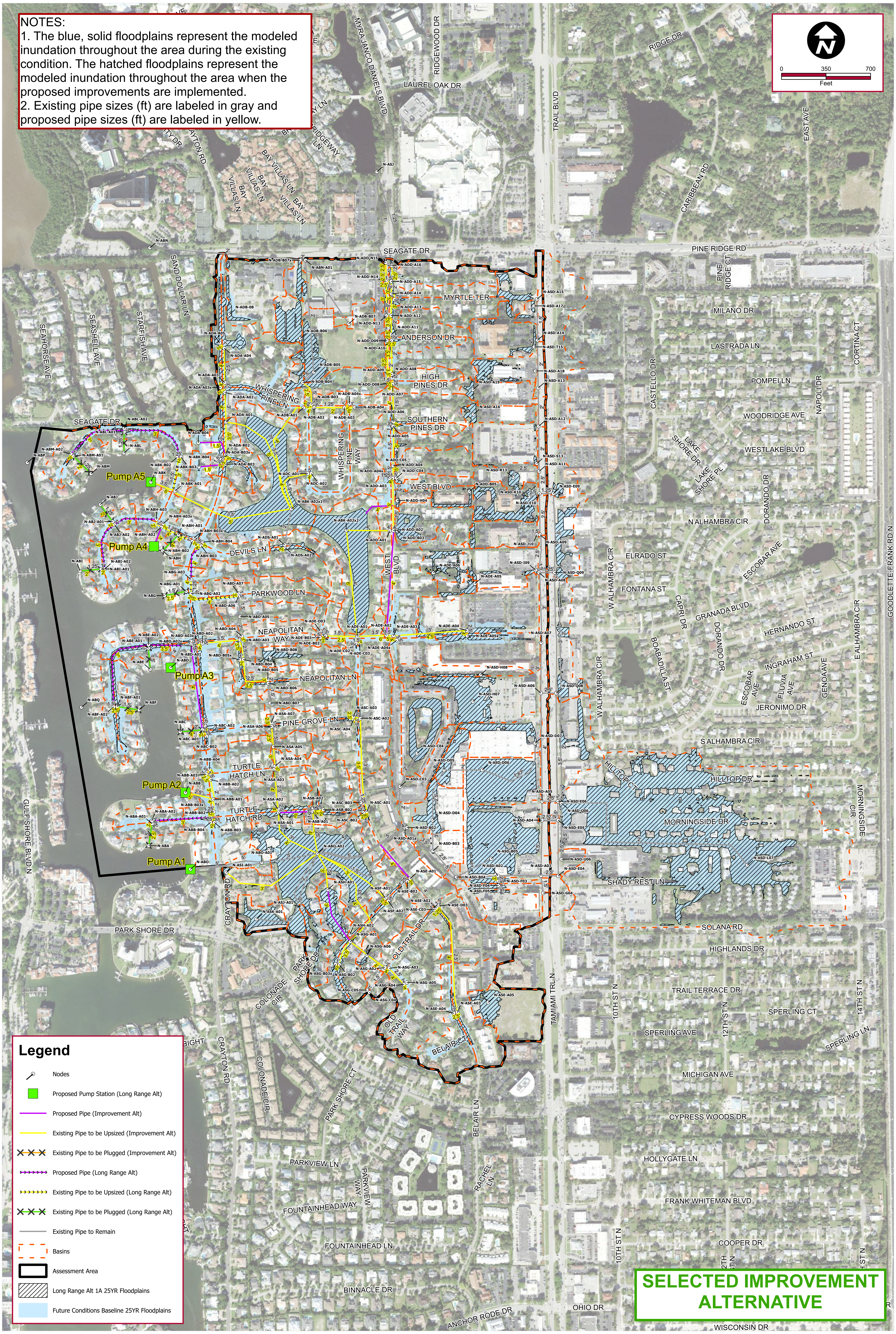
LONG RANGE ALT 1A
FUTURE TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
10 YEAR MODEL RESULTS

FIGURE
05-1A-10



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LONG RANGE ALT 1A
FUTURE TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
25 YEAR MODEL RESULTS

FIGURE
05-1A-25

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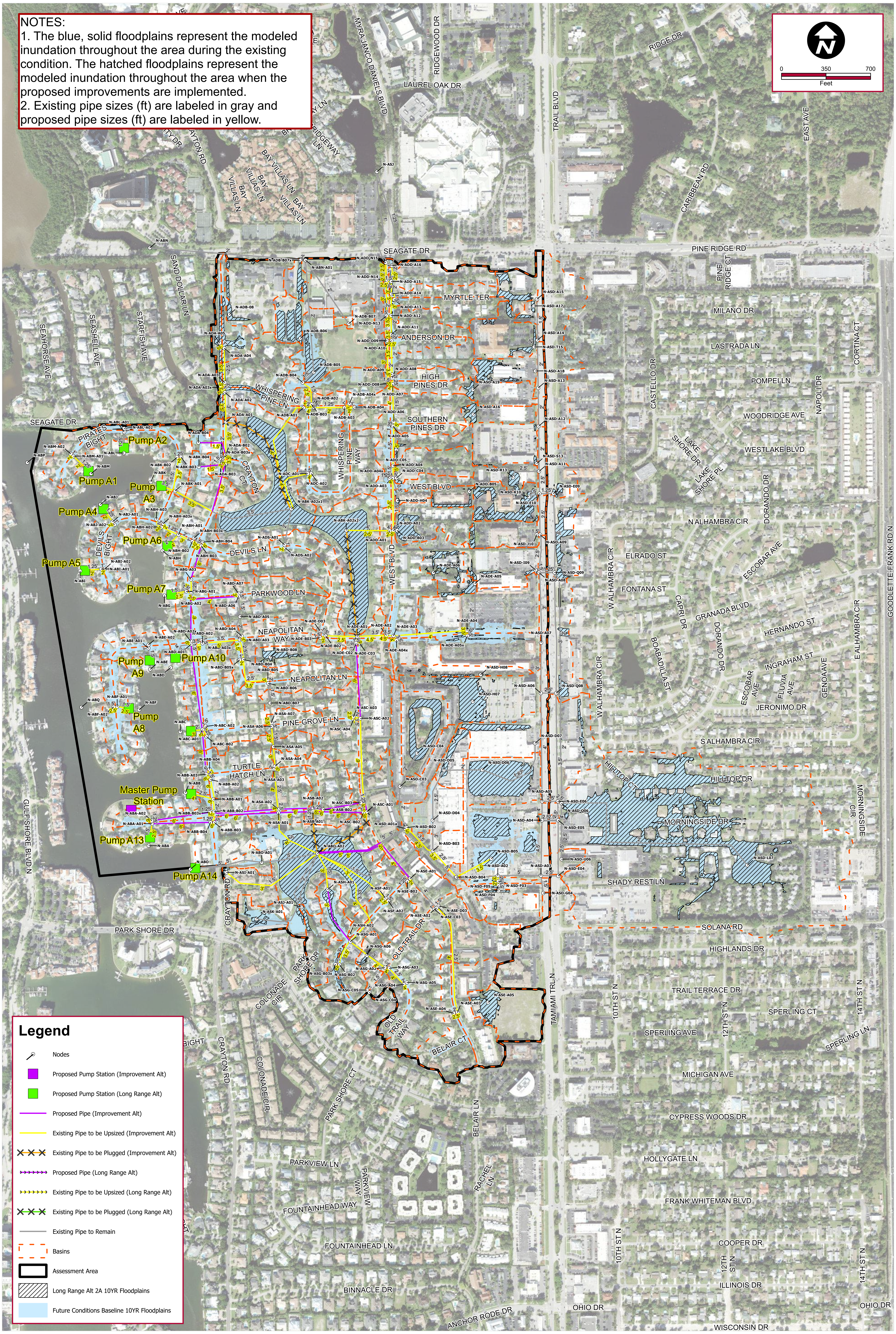

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CITY OF NAPLES FLORIDA

LONG RANGE ALT 2A
FUTURE TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
10 YEAR MODEL RESULTS

FIGURE
05-2A-10

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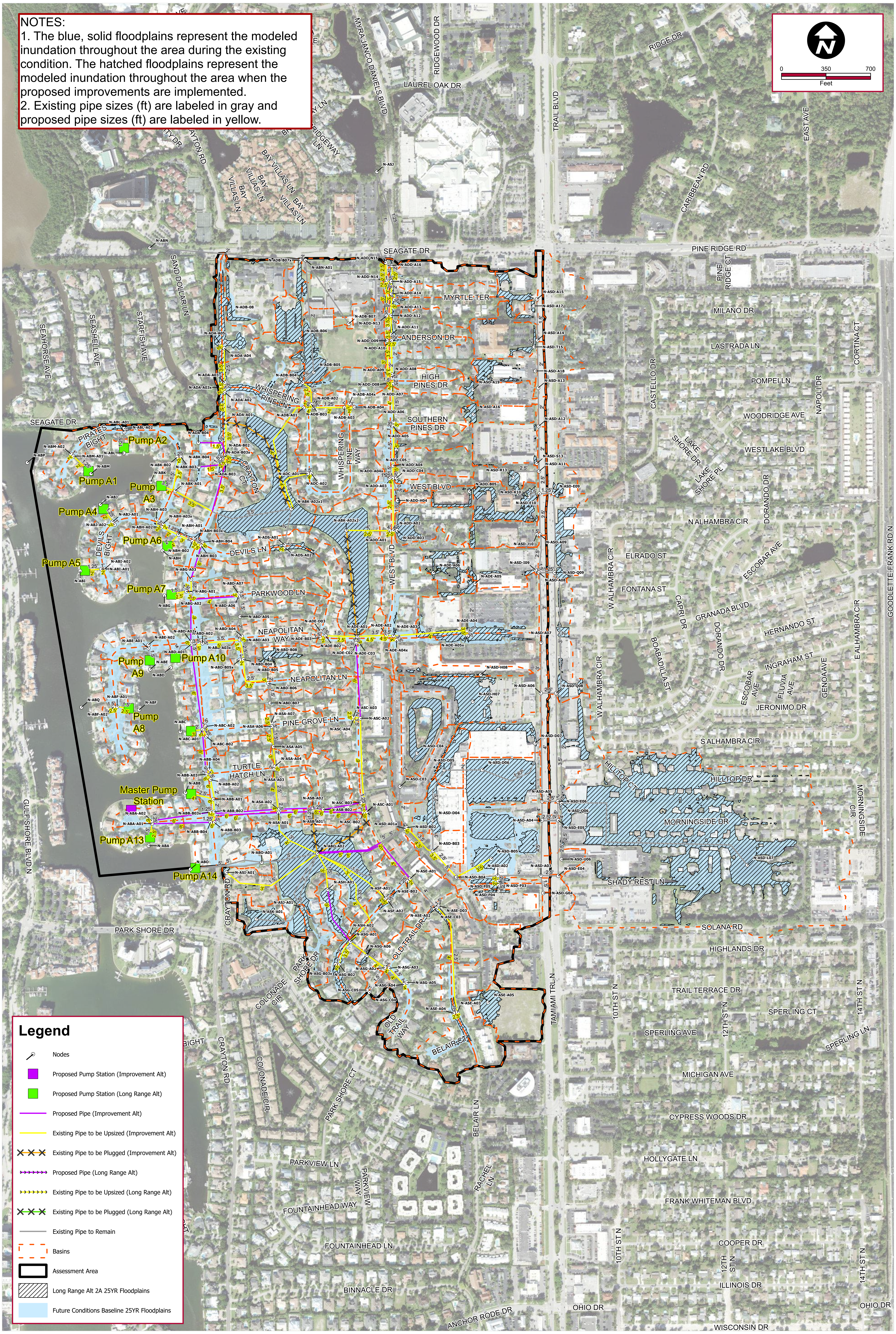

Legend

- Nodes
- Proposed Pump Station (Improvement Alt)
- Proposed Pump Station (Long Range Alt)
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Proposed Pipe (Long Range Alt)
- Existing Pipe to be Upsized (Long Range Alt)
- Existing Pipe to be Plugged (Long Range Alt)
- Existing Pipe to Remain
- Basins
- Assessment Area
- Long Range Alt 2A 25YR Floodplains
- Future Conditions Baseline 25YR Floodplains

No.	REVISIONS	DATE	BY

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CITY OF NAPLES FLORIDA

LONG RANGE ALT 2A FUTURE TAILWATER UPSIZED TRUNKLINES & ADDED PUMPS 25 YEAR MODEL RESULTS

FIGURE 05-2A-25

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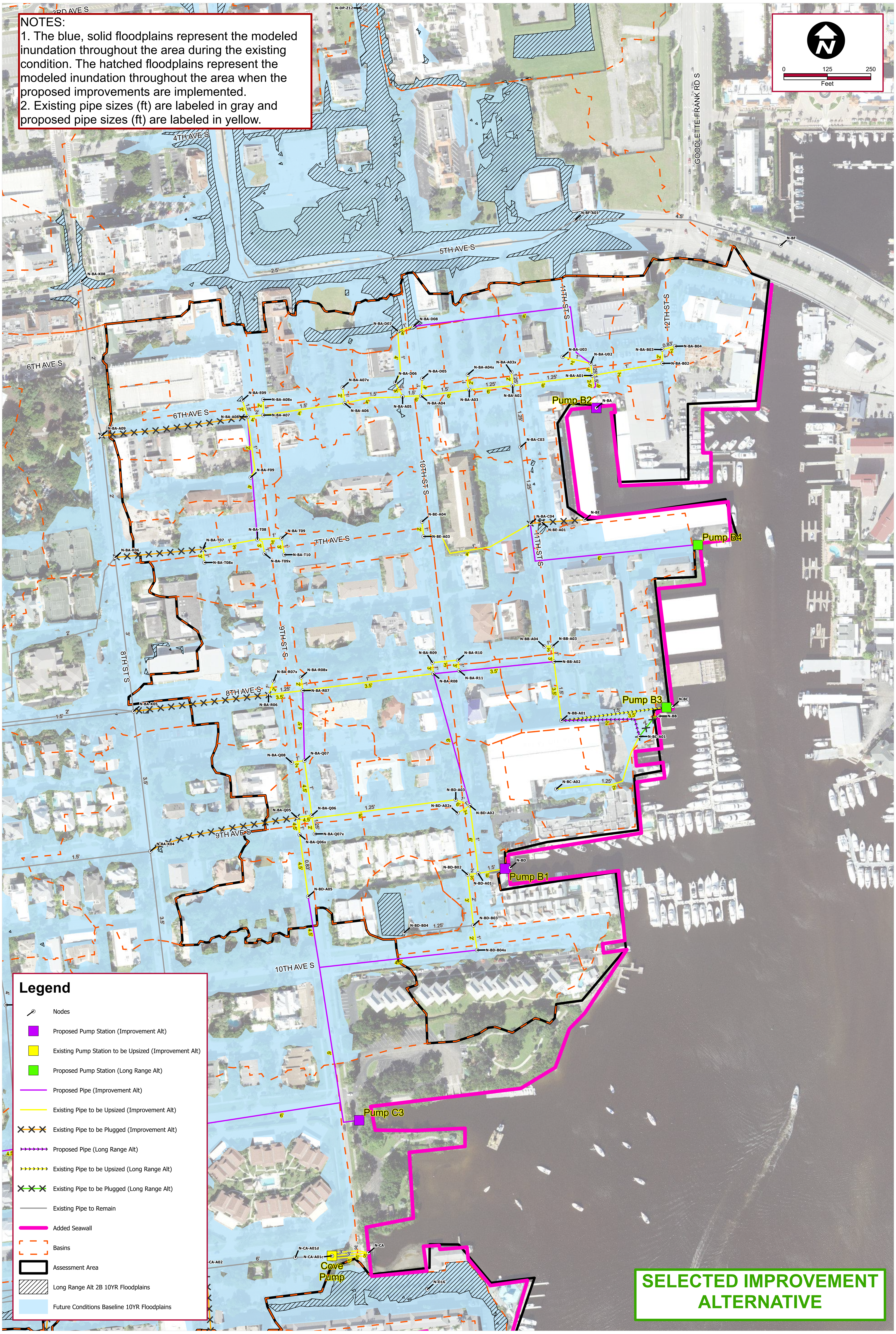

Legend

- Nodes
- Proposed Pump Station (Improvement Alt)
- Existing Pump Station to be Upsized (Improvement Alt)
- Proposed Pump Station (Long Range Alt)
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Proposed Pipe (Long Range Alt)
- Existing Pipe to be Upsized (Long Range Alt)
- Existing Pipe to be Plugged (Long Range Alt)
- Existing Pipe to Remain
- Added Seawall
- Basins
- Assessment Area
- Long Range Alt 2B 10YR Floodplains
- Future Conditions Baseline 10YR Floodplains

SELECTED IMPROVEMENT ALTERNATIVE

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\05 Long Range Alts\Long_Range_Alts\Long_Range_Alts.aprx - 11/29/2023 5:27 PM - Henry.Albright

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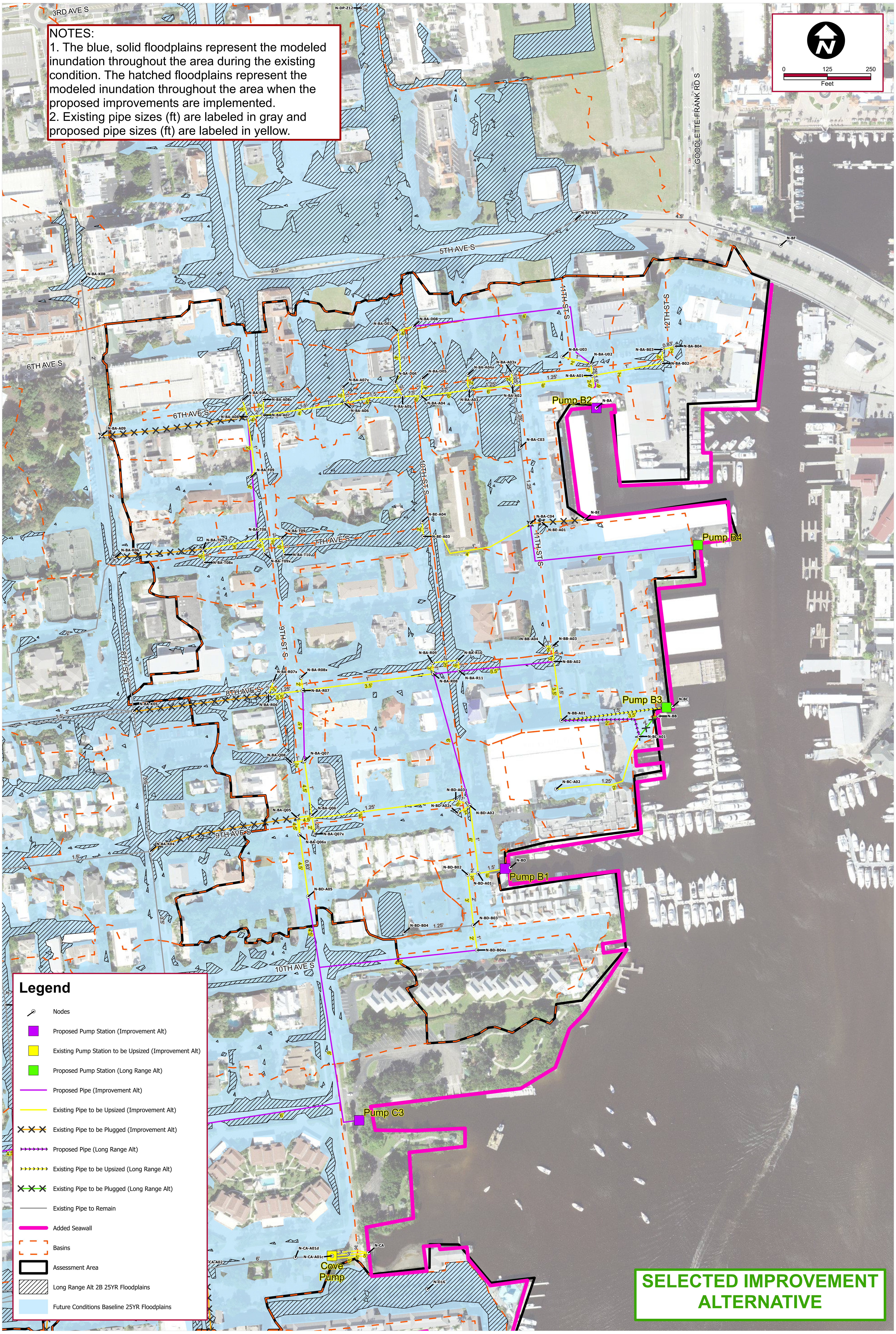
LONG RANGE ALT 2B FUTURE TAILWATER UPSIZED TRUNKLINES & ADDED PUMPS 10 YEAR MODEL RESULTS

FIGURE
05-2B-10



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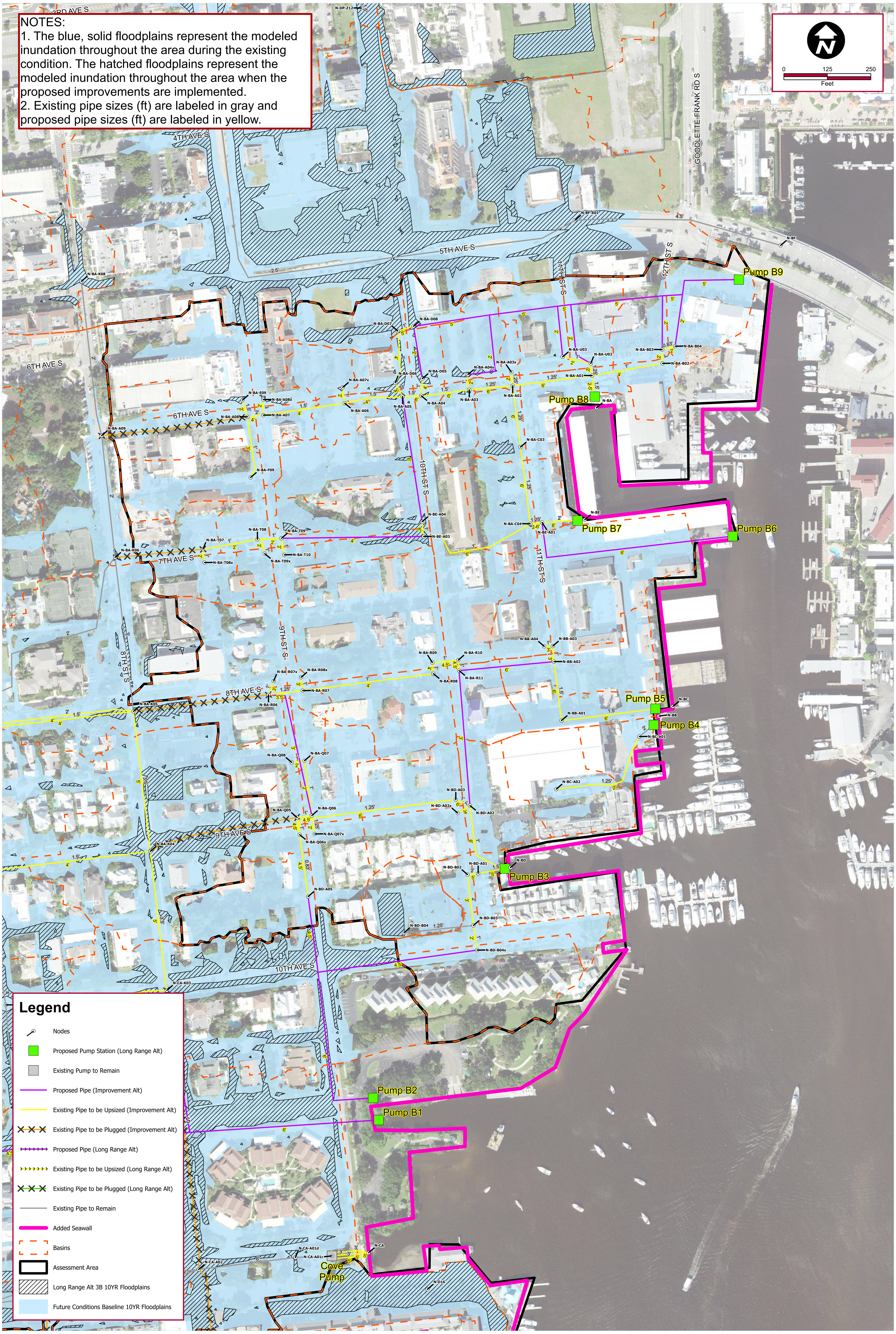
LONG RANGE ALT 2B
FUTURE TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
25 YEAR MODEL RESULTS

FIGURE
05-2B-25



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LONG RANGE ALT 3B FUTURE TAILWATER UPSIZED TRUNKLINES & ADDED PUMPS 10 YEAR MODEL RESULTS

FIGURE
05-3B-10

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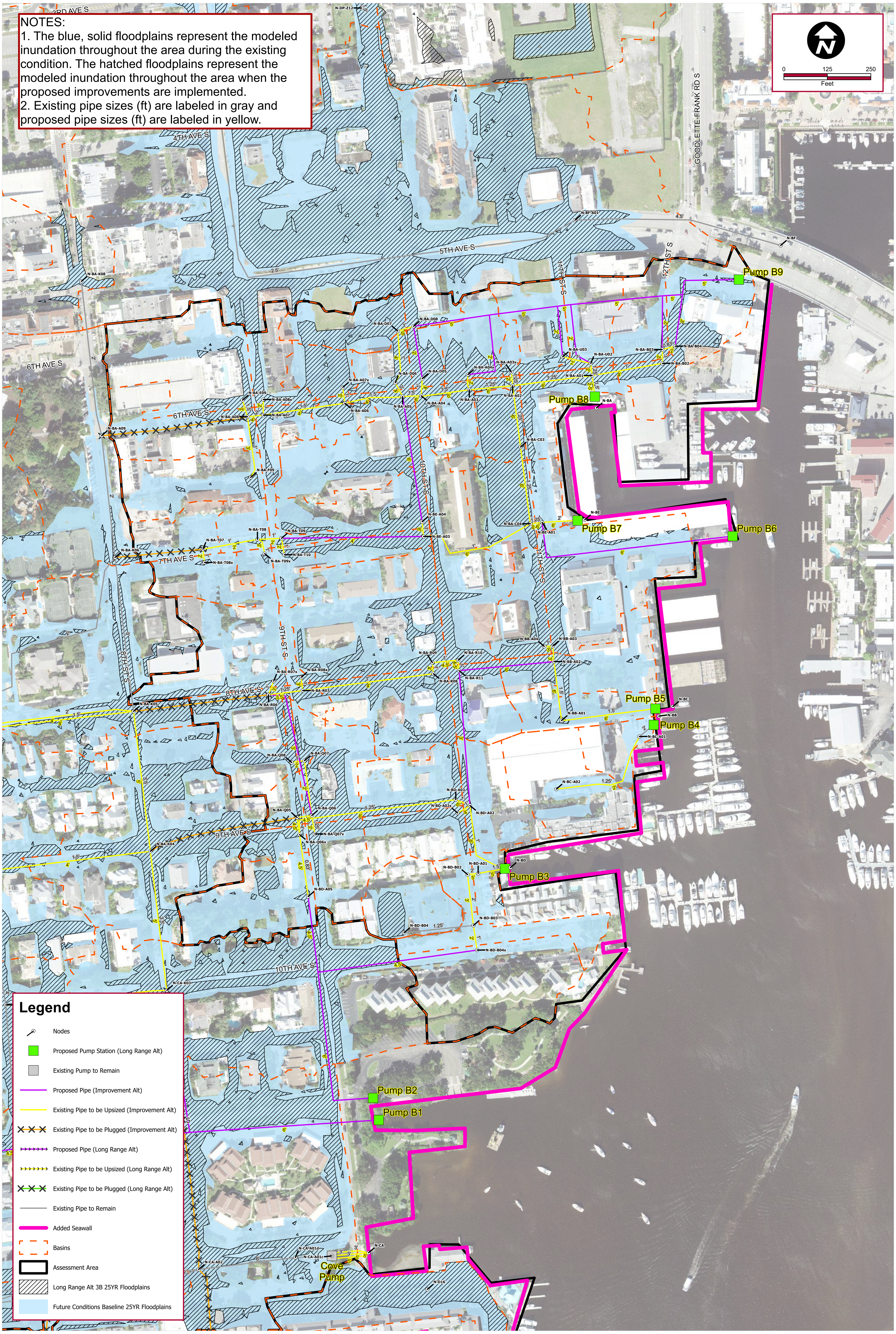

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LONG RANGE ALT 3B
FUTURE TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
25 YEAR MODEL RESULTS

FIGURE
05-3B-25

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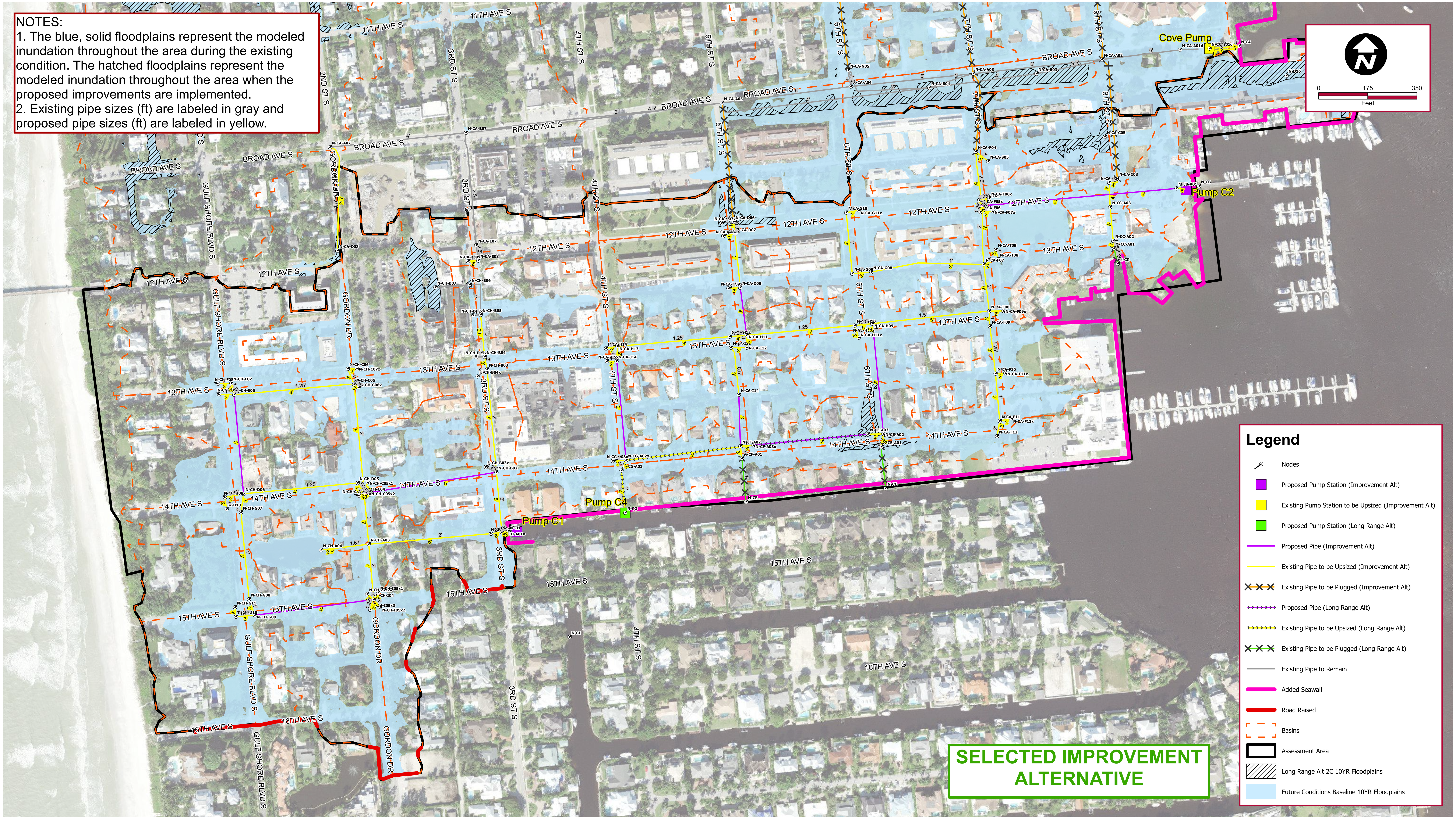

Legend

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- Proposed Pump Station (Improvement Alt)
- Existing Pump Station to be Upsized (Improvement Alt)
- Proposed Pump Station (Long Range Alt)
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Proposed Pipe (Long Range Alt)
- Existing Pipe to be Upsized (Long Range Alt)
- Existing Pipe to be Plugged (Long Range Alt)
- Existing Pipe to Remain
- Added Seawall
- Road Raised
- Basins
- Assessment Area
- Long Range Alt 2C 10YR Floodplains
- Future Conditions Baseline 10YR Floodplains

SELECTED IMPROVEMENT ALTERNATIVE

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LONG RANGE ALT 2C
FUTURE TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
10 YEAR MODEL RESULTS

FIGURE 05-2C-10

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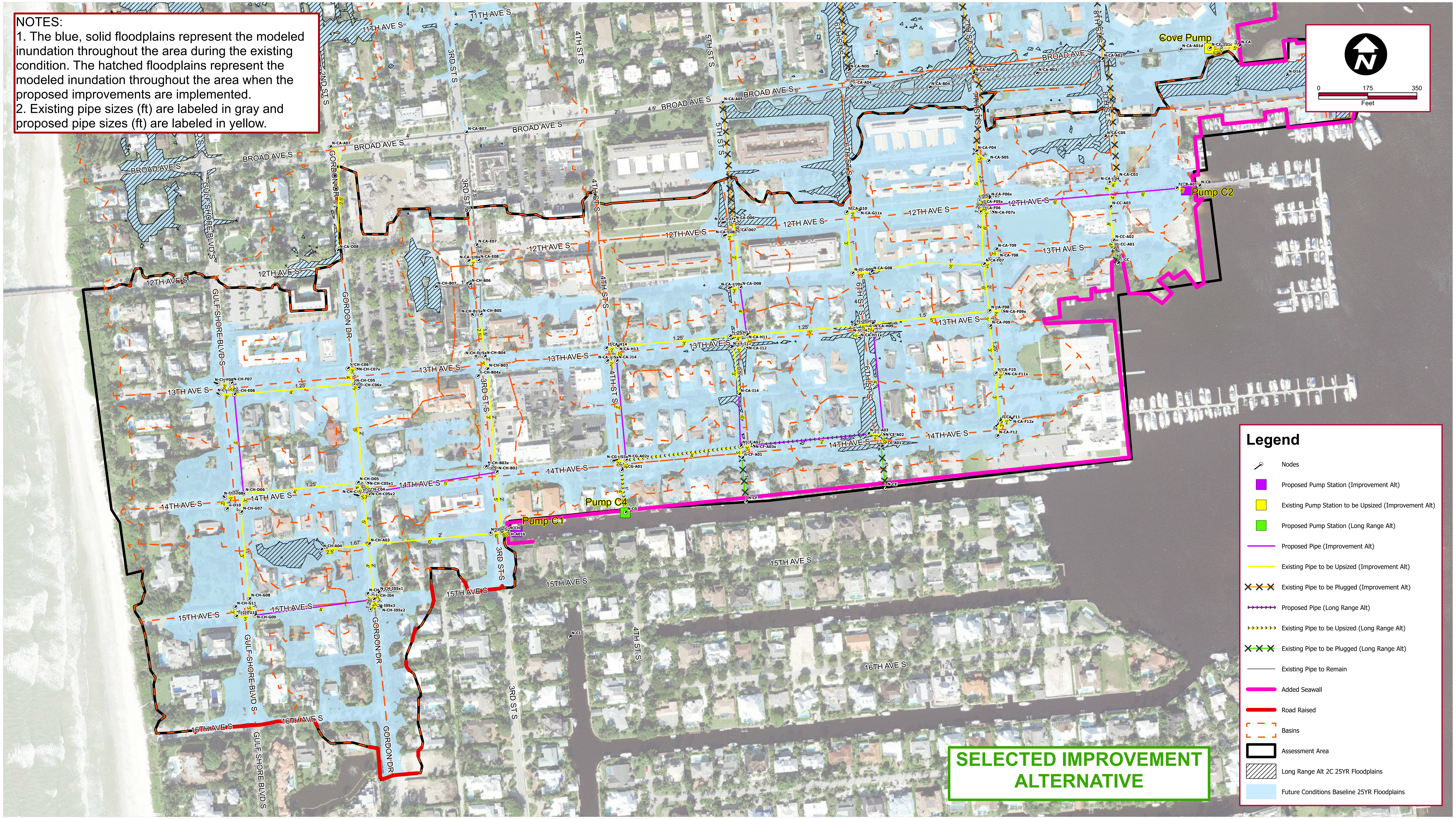

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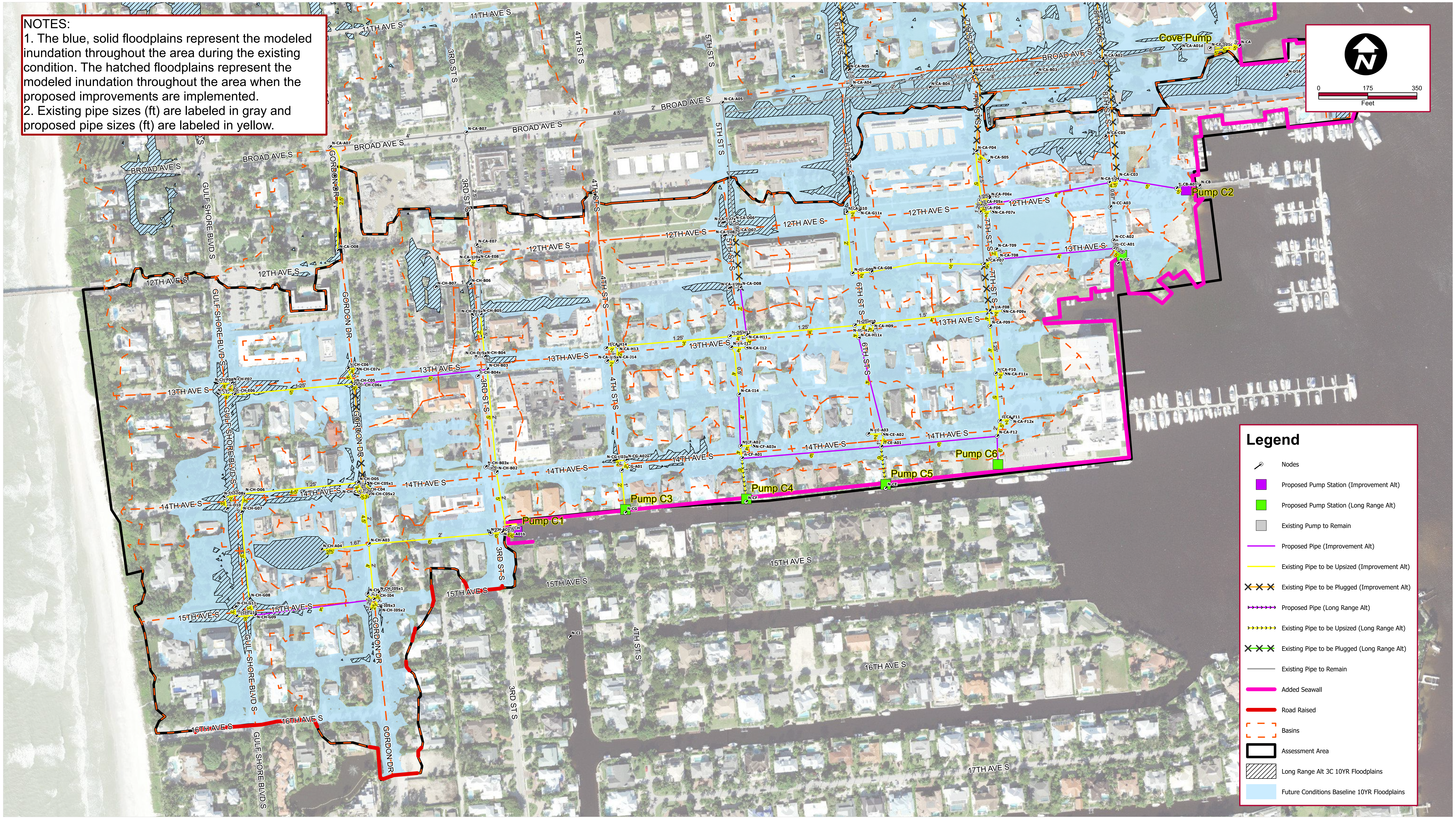
LONG RANGE ALT 2C FUTURE TAILWATER UPSIZED TRUNKLINES & ADDED PUMPS 25 YEAR MODEL RESULTS

FIGURE

05-2C-25

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\05 Long Range Alts\Long_Range_Alts.aprx - 11/29/2023 5:25 PM - Henry.Albright



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2. Existing pipe sizes (ft) are labeled in gray and proposed pipe sizes (ft) are labeled in yellow.

Legend

- Nodes
- Proposed Pump Station (Improvement Alt)
- Proposed Pump Station (Long Range Alt)
- Existing Pump to Remain
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Proposed Pipe (Long Range Alt)
- Existing Pipe to be Upsized (Long Range Alt)
- Existing Pipe to be Plugged (Long Range Alt)
- Existing Pipe to Remain
- Added Seawall
- Road Raised
- Basins
- Assessment Area
- Long Range Alt 3C 10YR Floodplains
- Future Conditions Baseline 10YR Floodplains

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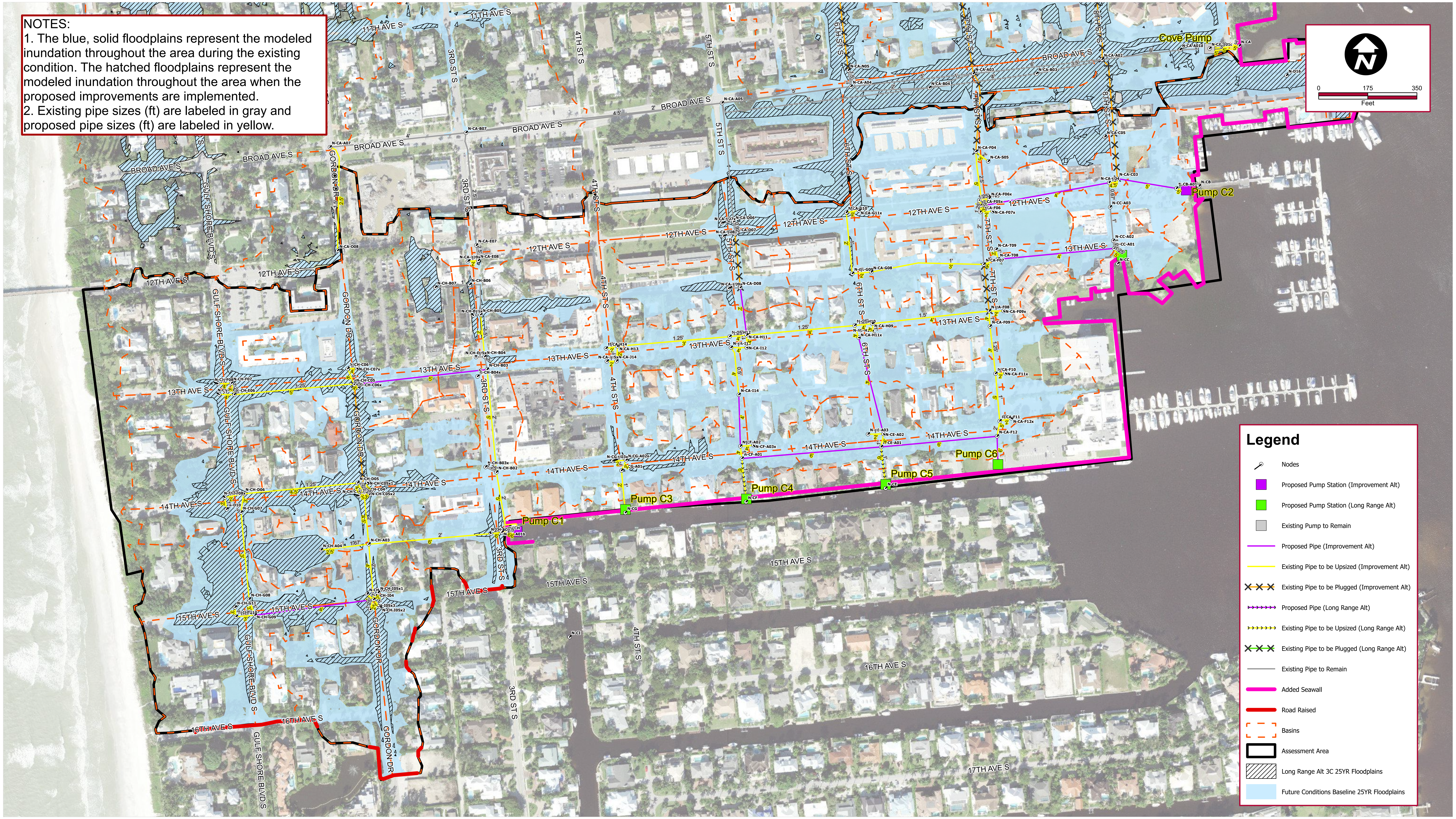
CITY OF NAPLES

LONG RANGE ALT 3C
FUTURE TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
10 YEAR MODEL RESULTS

FIGURE

05-3C-10



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LONG RANGE ALT 3C
FUTURE TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
25 YEAR MODEL RESULTS

FIGURE
05-3C-25

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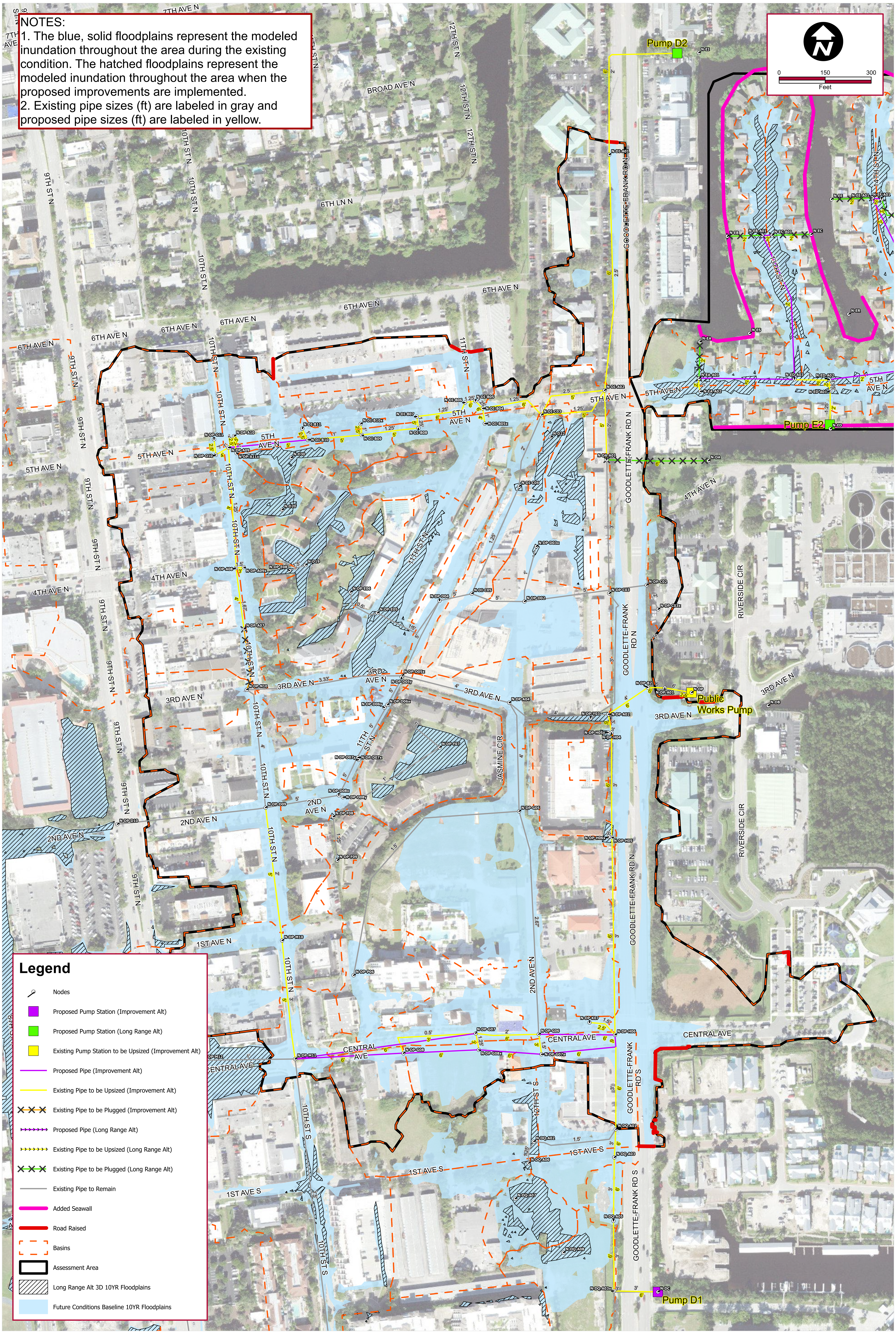

Legend

- Nodes
- Proposed Pump Station (Improvement Alt)
- Proposed Pump Station (Long Range Alt)
- Existing Pump Station to be Upsized (Improvement Alt)
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Proposed Pipe (Long Range Alt)
- Existing Pipe to be Upsized (Long Range Alt)
- Existing Pipe to be Plugged (Long Range Alt)
- Existing Pipe to Remain
- Added Seawall
- Road Raised
- Basins
- Assessment Area
- Long Range Alt 3D 10YR Floodplains
- Future Conditions Baseline 10YR Floodplains

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LONG RANGE ALT 2D
FUTURE TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
10 YEAR MODEL RESULTS

FIGURE
05-2D-10

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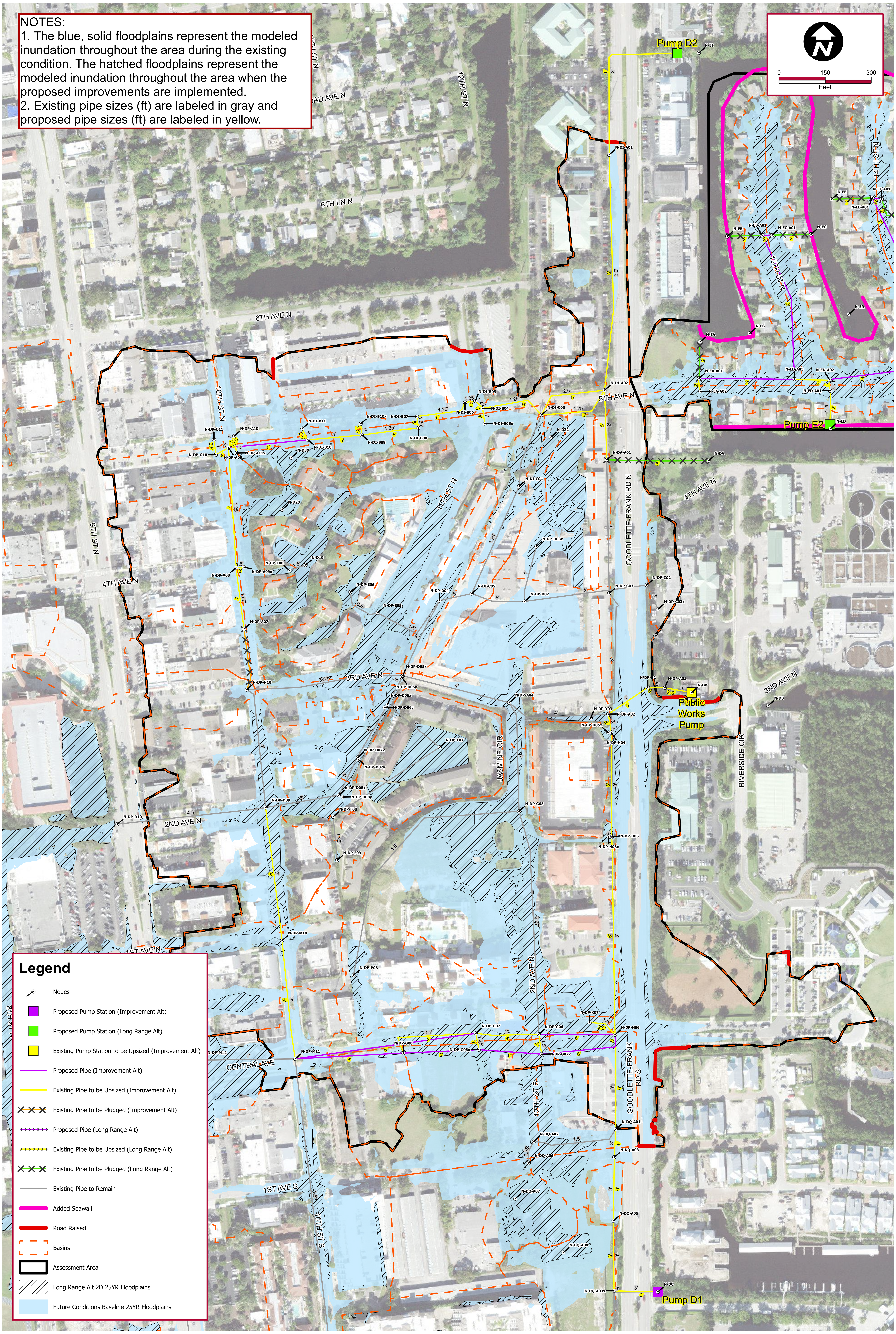

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LONG RANGE ALT 2D
FUTURE TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
25 YEAR MODEL RESULTS

FIGURE
05-2D-25

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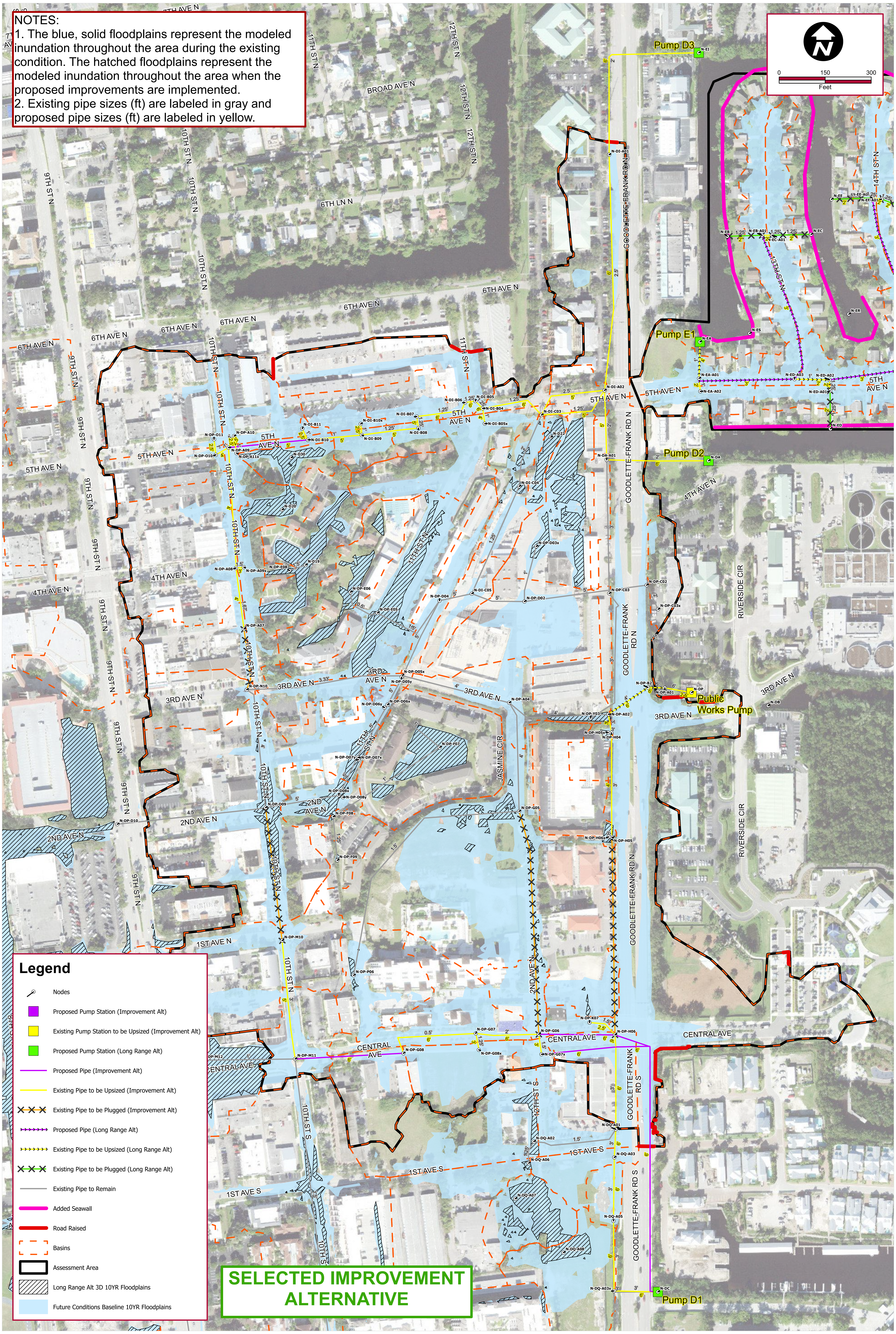

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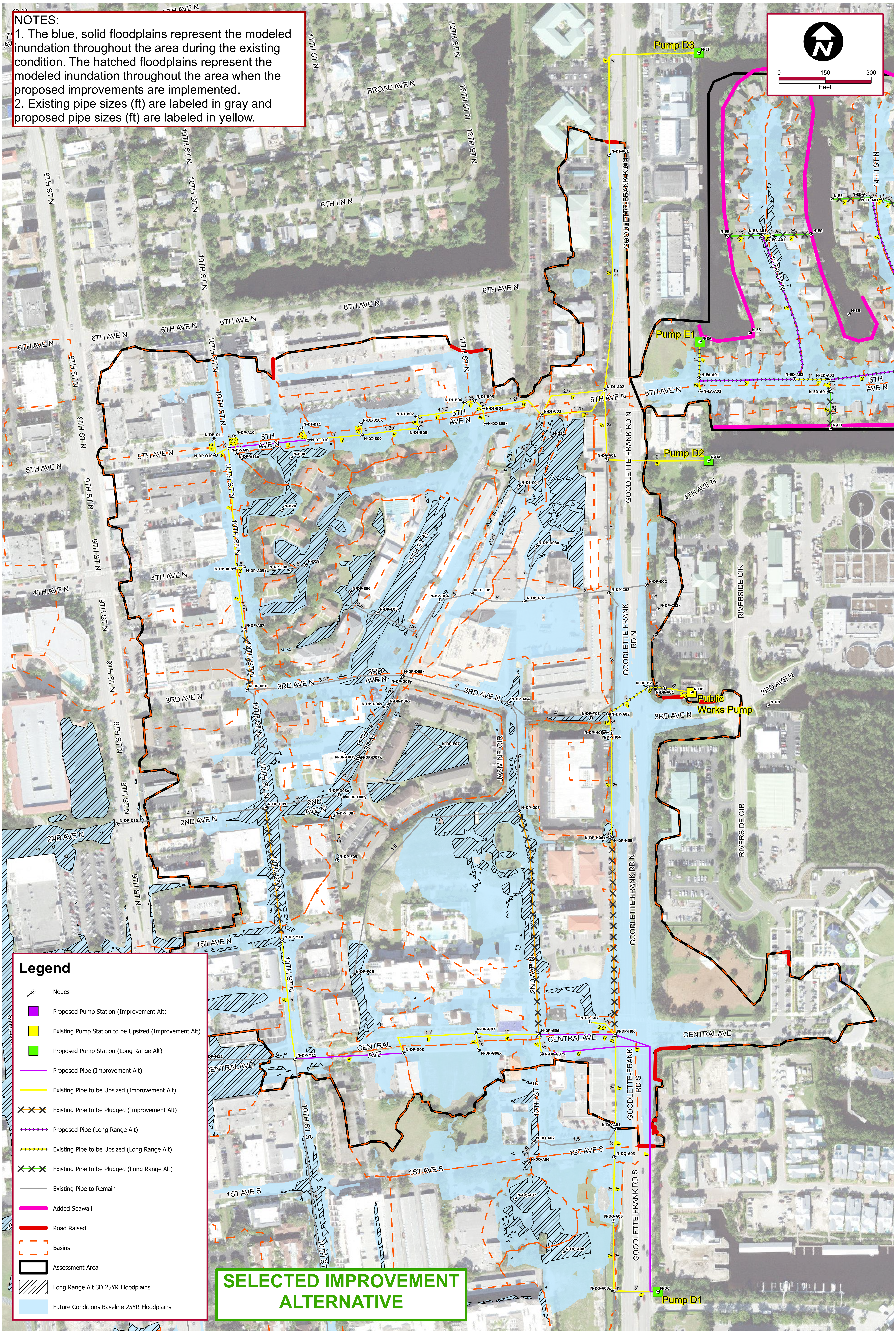
LONG RANGE ALT 3D FUTURE TAILWATER UPSIZED TRUNKLINES & ADDED PUMPS 10 YEAR MODEL RESULTS

FIGURE
05-3D-10



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0 150 300
Feet

Legend

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- Existing Pump Station to be Upsized (Improvement Alt)
- Proposed Pump Station (Long Range Alt)
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Proposed Pipe (Long Range Alt)
- Existing Pipe to be Upsized (Long Range Alt)
- Existing Pipe to be Plugged (Long Range Alt)
- Existing Pipe to Remain
- Added Seawall
- Road Raised
- Basins
- Assessment Area
- Long Range Alt 3D 25YR Floodplains
- Future Conditions Baseline 25YR Floodplains

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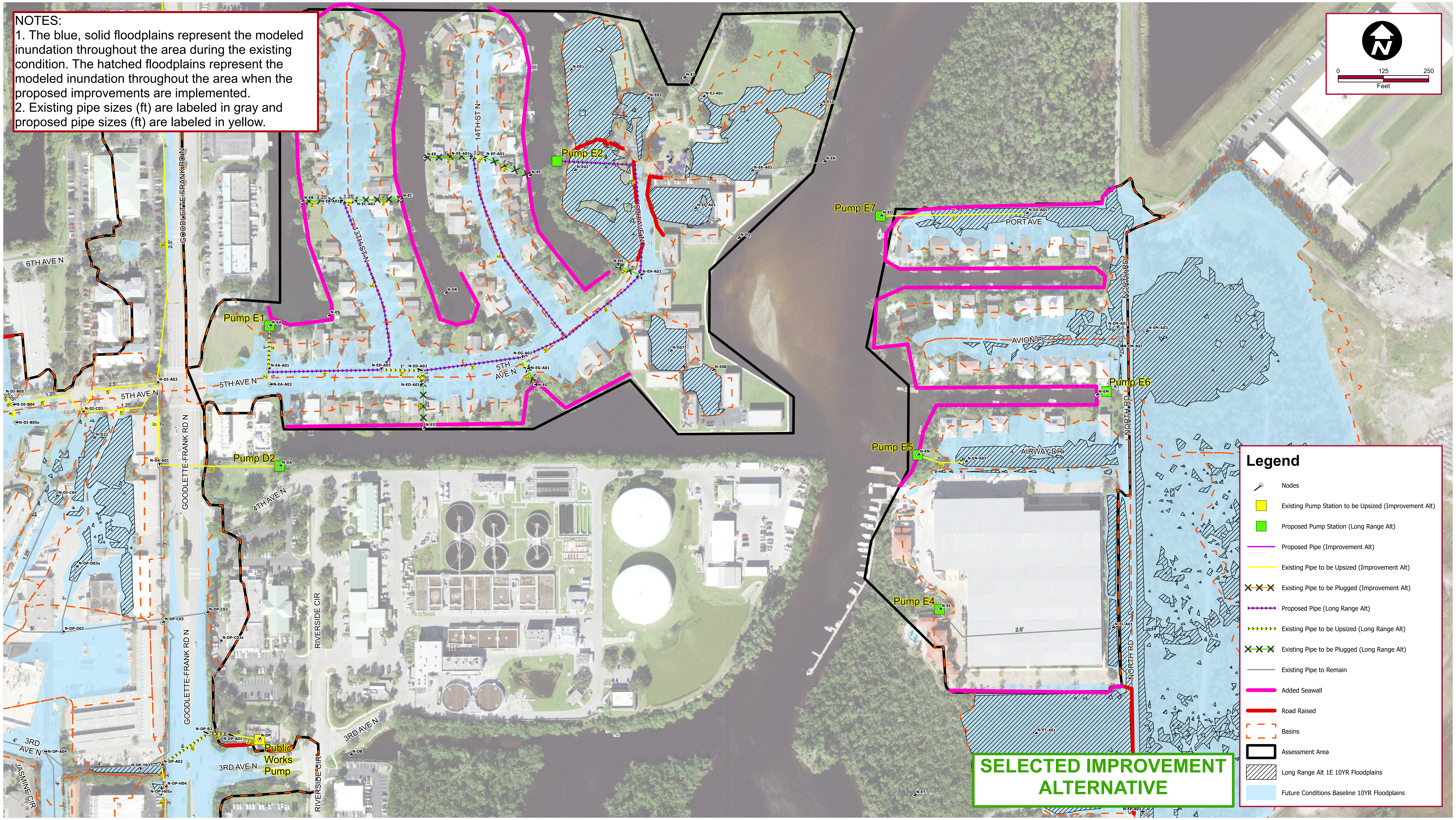
LONG RANGE ALT 3D FUTURE TAILWATER UPSIZED TRUNKLINES & ADDED PUMPS 25 YEAR MODEL RESULTS

FIGURE
05-3D-25



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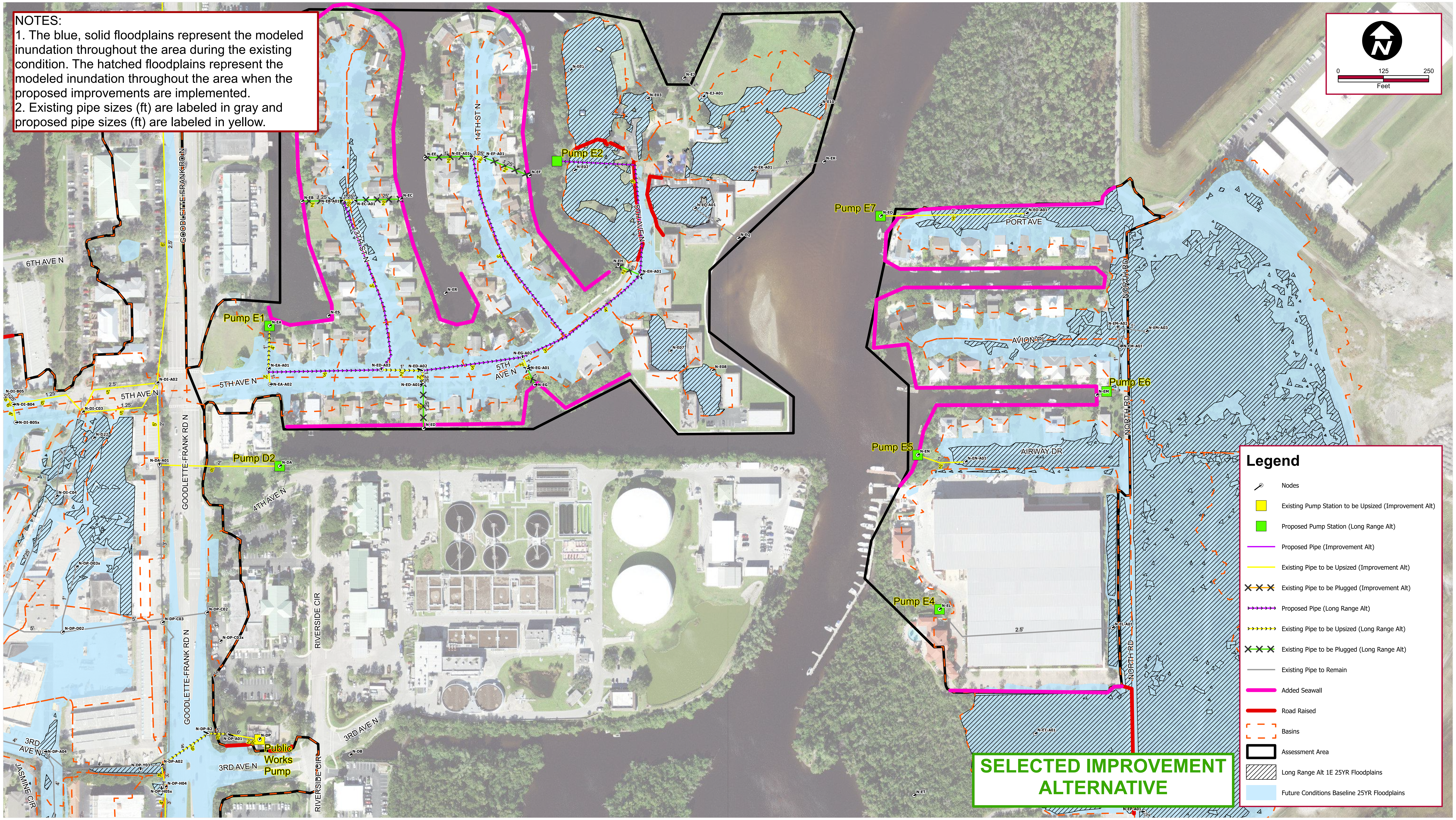
LONG RANGE ALT 1E FUTURE TAILWATER UPSIZED TRUNKLINES & ADDED PUMPS 10 YEAR MODEL RESULTS

FIGURE 05-1E-10



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LONG RANGE ALT 1E FUTURE TAILWATER UPSIZED TRUNKLINES & ADDED PUMPS 25 YEAR MODEL RESULTS

FIGURE

05-1E-25

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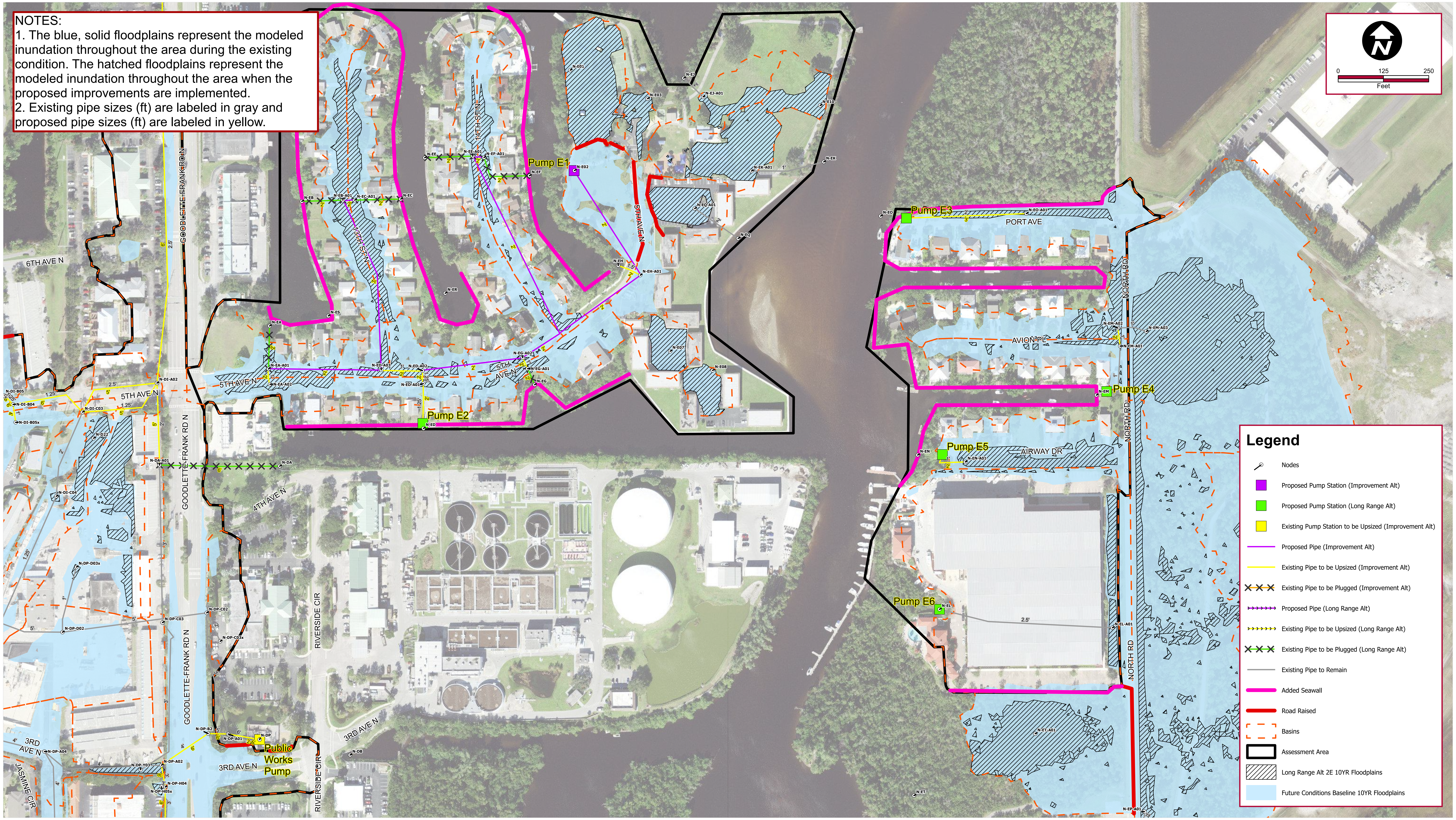

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LONG RANGE ALT 2E
FUTURE TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
10 YEAR MODEL RESULTS

FIGURE
05-2E-10

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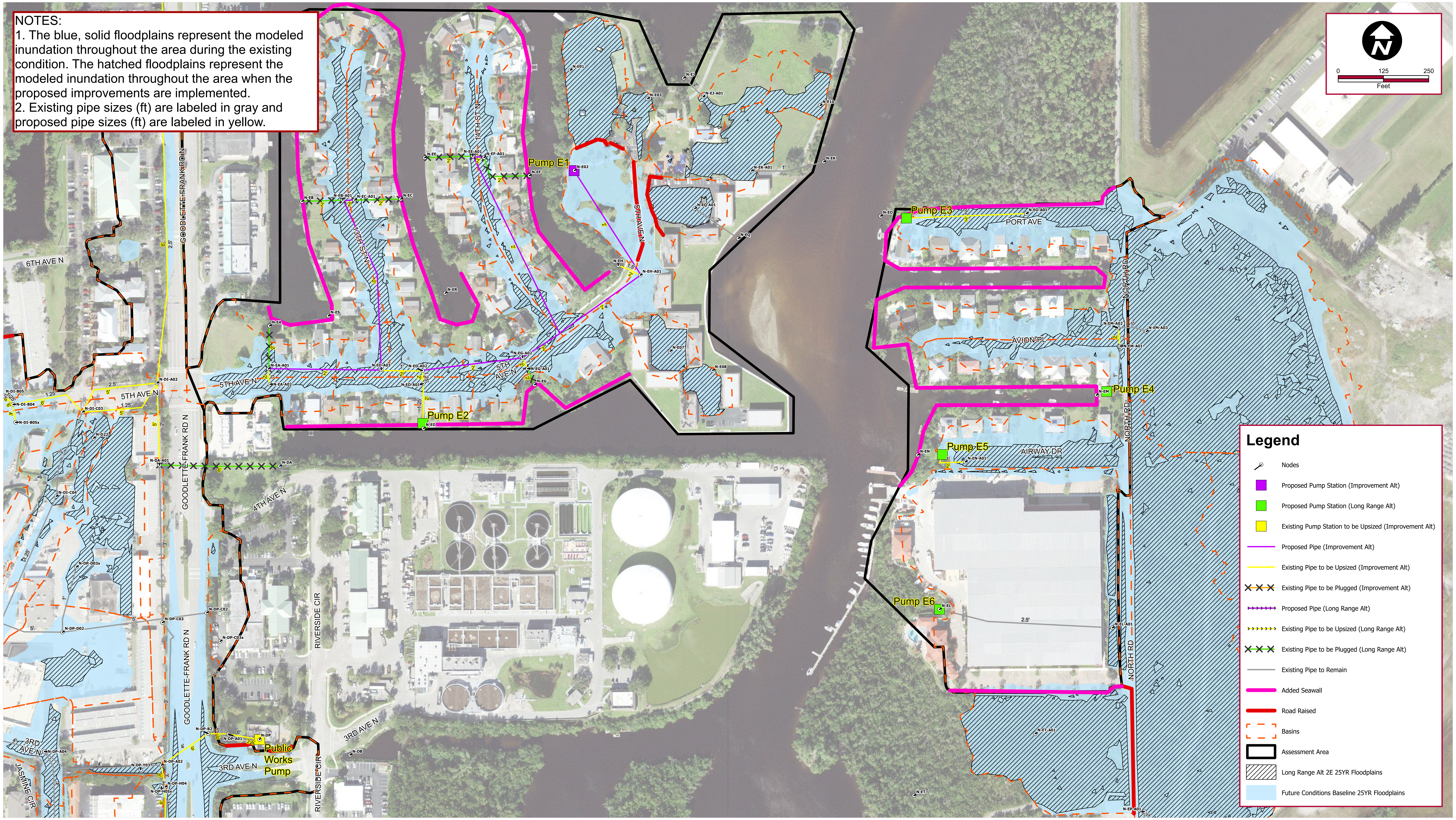

Legend

- Nodes
- Proposed Pump Station (Improvement Alt)
- Proposed Pump Station (Long Range Alt)
- Existing Pump Station to be Upsized (Improvement Alt)
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
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- Existing Pipe to Remain
- Added Seawall
- Road Raised
- Basins
- Assessment Area
- Long Range Alt 2E 25YR Floodplains
- Future Conditions Baseline 25YR Floodplains

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LONG RANGE ALT 2E
FUTURE TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
25 YEAR MODEL RESULTS

FIGURE
05-2E-25

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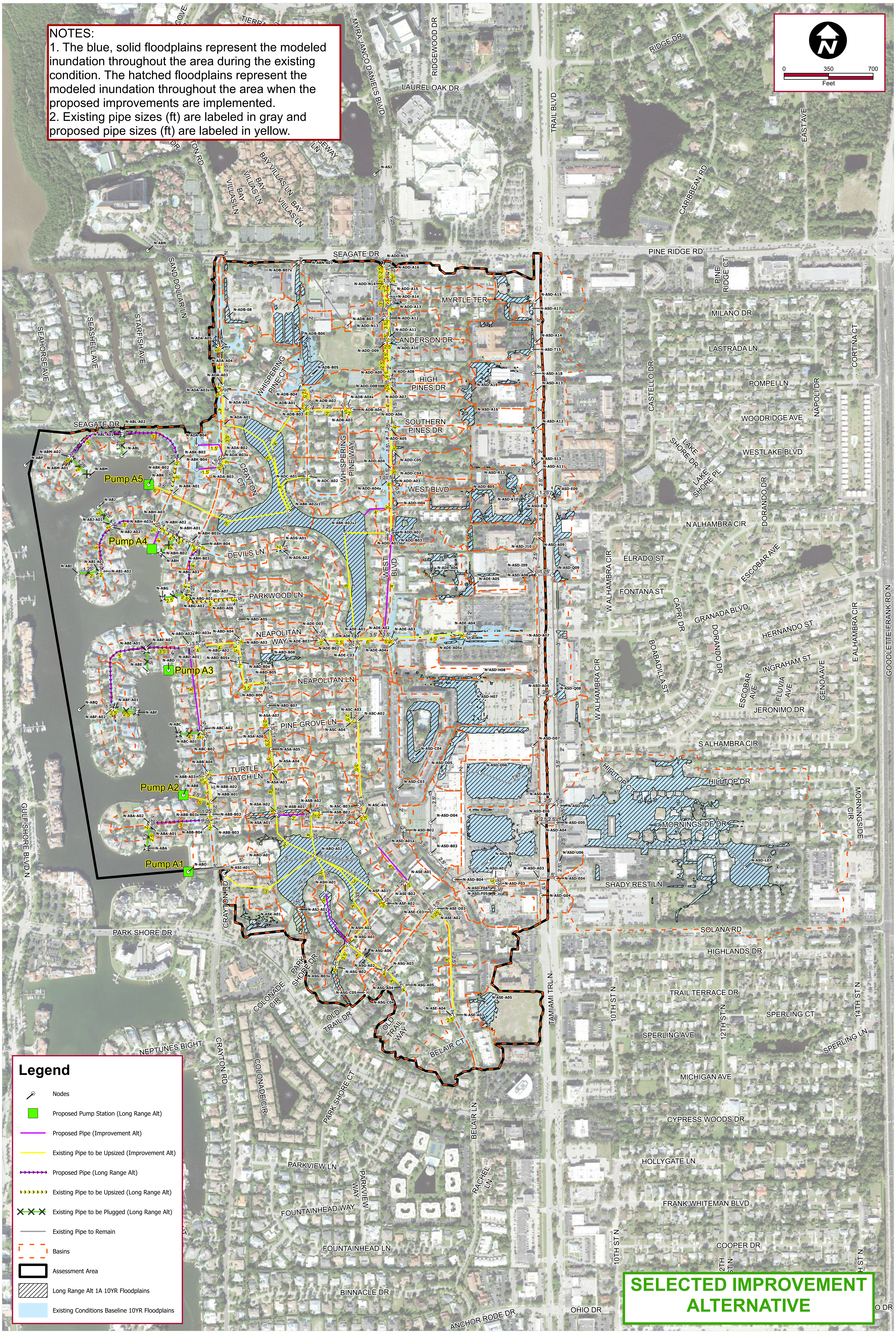
Long-Range Resilient Alternatives with Existing Condition Tailwater



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LONG RANGE ALT 1A
EXISTING TAILWATER
UPSIZED TRUNKLINES & ADDED PUMPS
10YR MODEL RESULTS

FIGURE
06-1A-10

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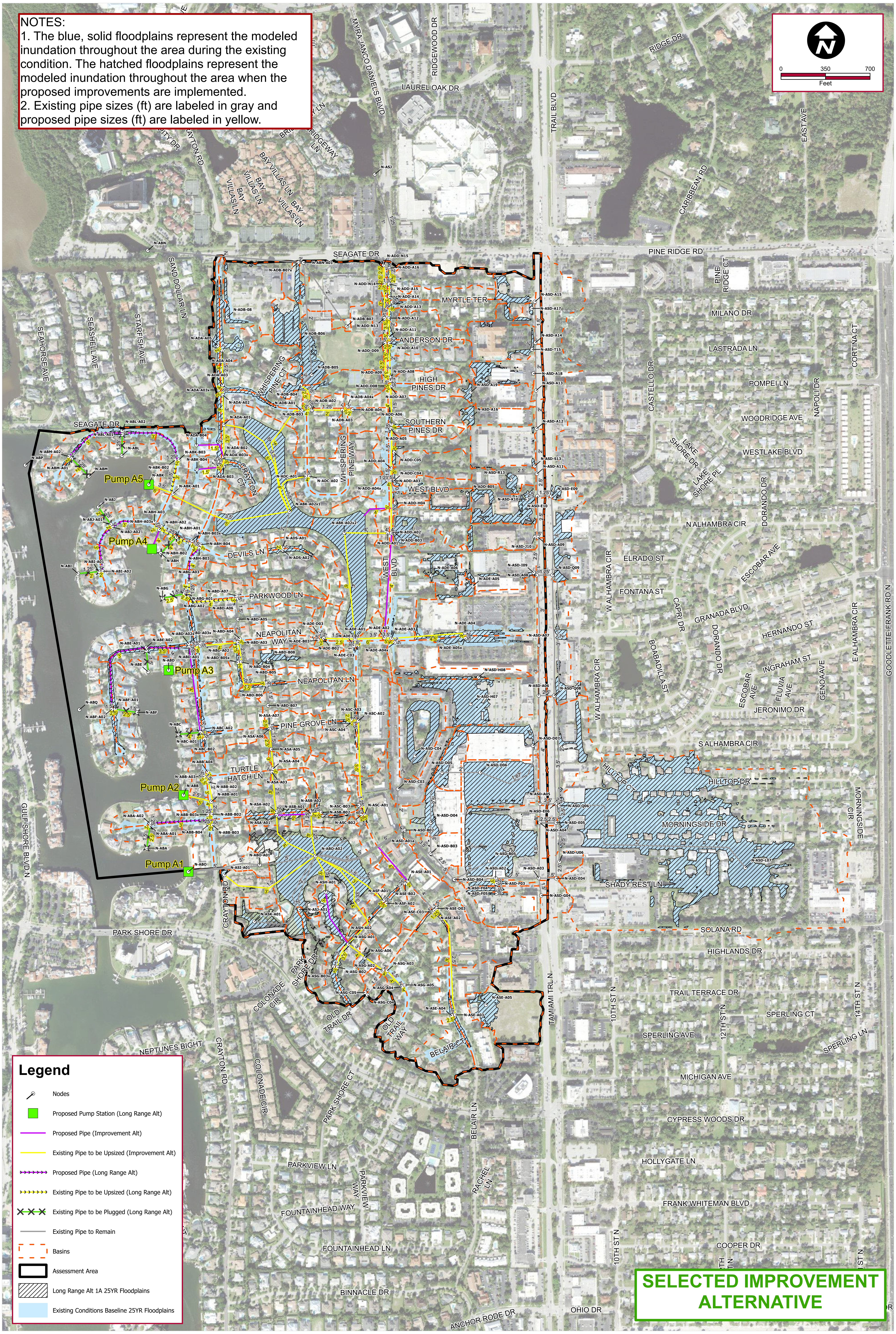

Legend

- Nodes
- Proposed Pump Station (Long Range Alt)
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Proposed Pipe (Long Range Alt)
- Existing Pipe to be Upsized (Long Range Alt)
- Existing Pipe to be Plugged (Long Range Alt)
- Existing Pipe to Remain
- Basins
- Assessment Area
- Long Range Alt 1A 25YR Floodplains
- Existing Conditions Baseline 25YR Floodplains

SELECTED IMPROVEMENT ALTERNATIVE

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LONG RANGE ALT 1A
EXISTING TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
25YR MODEL RESULTS

FIGURE
06-1A-25

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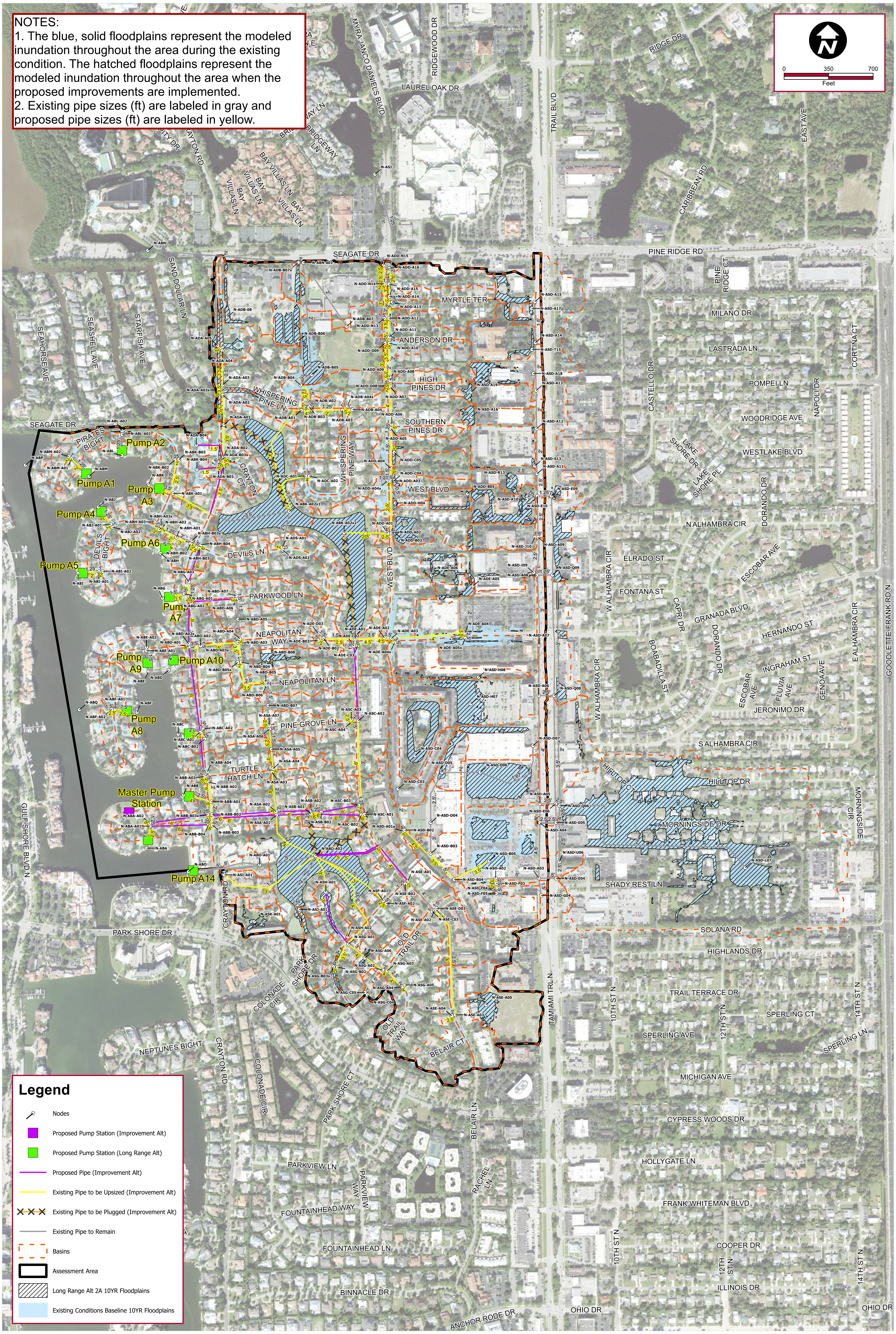

Legend

- Nodes
- Proposed Pump Station (Improvement Alt)
- Proposed Pump Station (Long Range Alt)
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Existing Pipe to Remain
- Basins
- Assessment Area
- Long Range Alt 2A 10YR Floodplains
- Existing Conditions Baseline 10YR Floodplains

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LONG RANGE ALT 2A EXISTING TAILWATER UPSIZED TRUNKLINES & ADDED PUMPS 10YR MODEL RESULTS

FIGURE
06-2A-10

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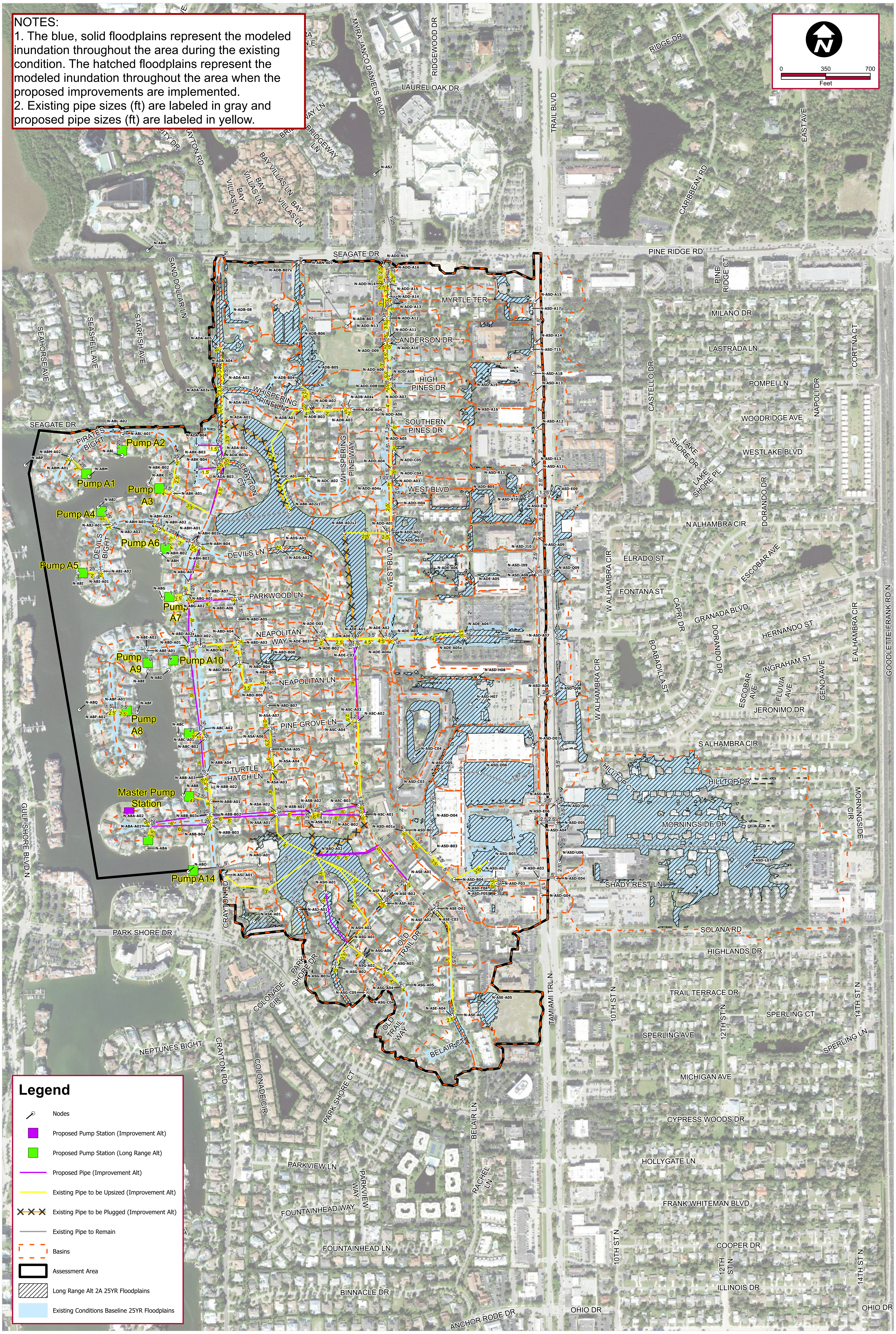

Legend

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- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Existing Pipe to Remain
- Basins
- Assessment Area
- Long Range Alt 2A 25YR Floodplains
- Existing Conditions Baseline 25YR Floodplains

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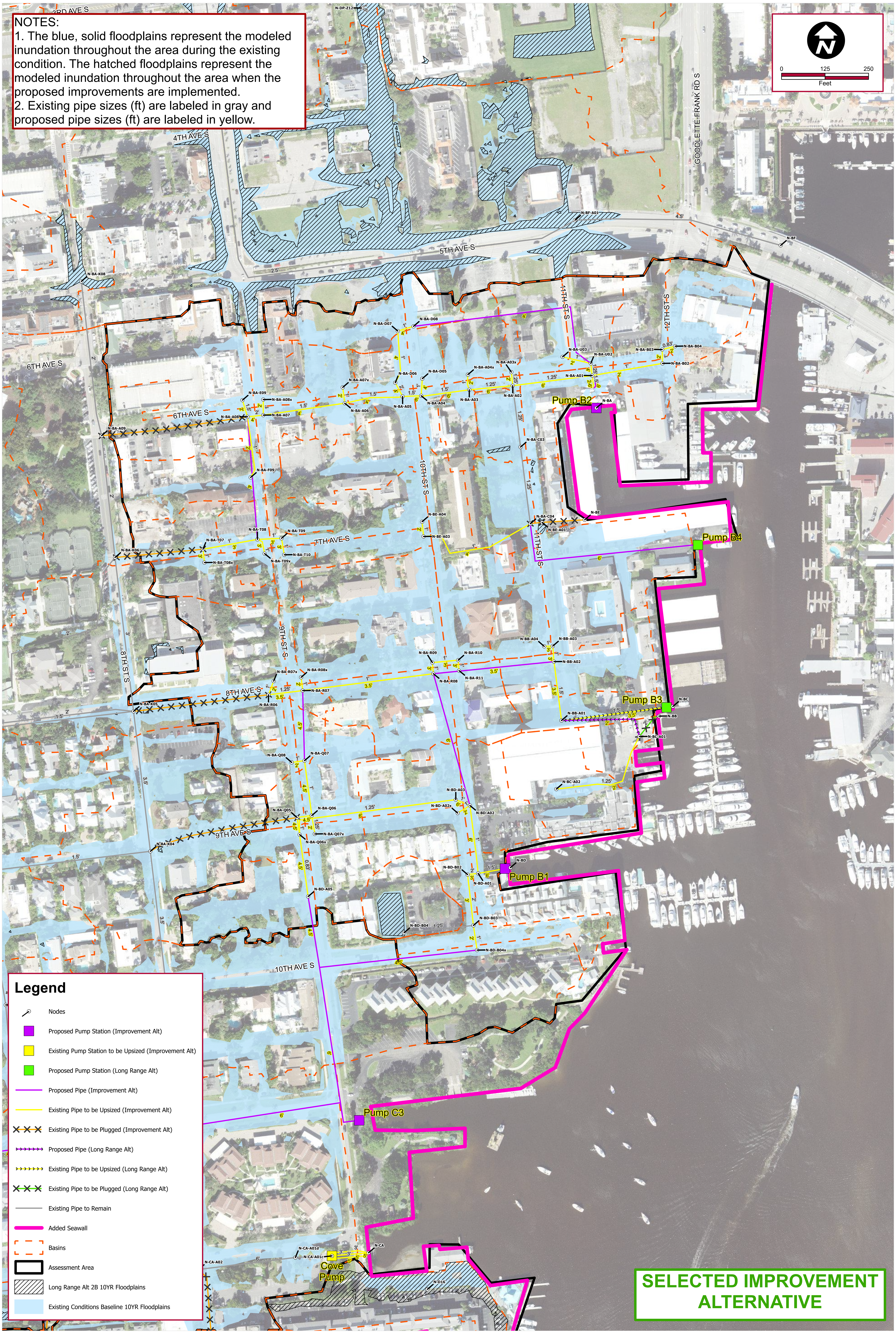
LONG RANGE ALT 2A
EXISTING TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
25YR MODEL RESULTS

FIGURE
06-2A-25



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LONG RANGE ALT 2B
EXISTING TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
10YR MODEL RESULTS

FIGURE
06-2B-10

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition. The hatched floodplains represent the modeled inundation throughout the area when the proposed improvements are implemented.
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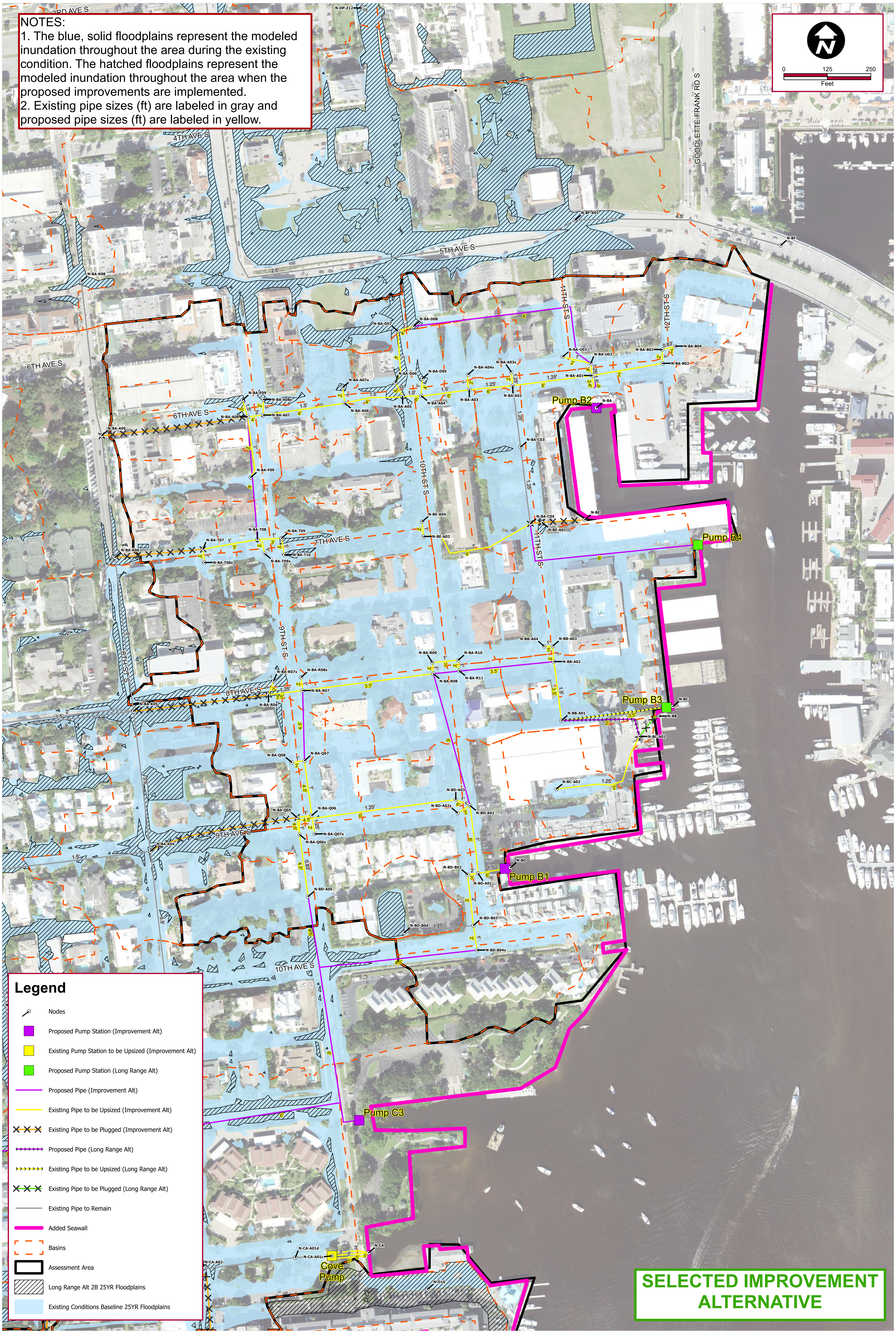

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- Existing Pump Station to be Upsized (Improvement Alt)
- Proposed Pump Station (Long Range Alt)
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Proposed Pipe (Long Range Alt)
- Existing Pipe to be Upsized (Long Range Alt)
- Existing Pipe to be Plugged (Long Range Alt)
- Existing Pipe to Remain
- Added Seawall
- Basins
- Assessment Area
- Long Range Alt 2B 25YR Floodplains
- Existing Conditions Baseline 25YR Floodplains

SELECTED IMPROVEMENT ALTERNATIVE

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\06 Long Range Alts with Existing Tailwater\Long_Range_Alts_EC\Long_Range_Alts_EC.aprx - 11/30/2023 1:55 PM - Henry.Albright

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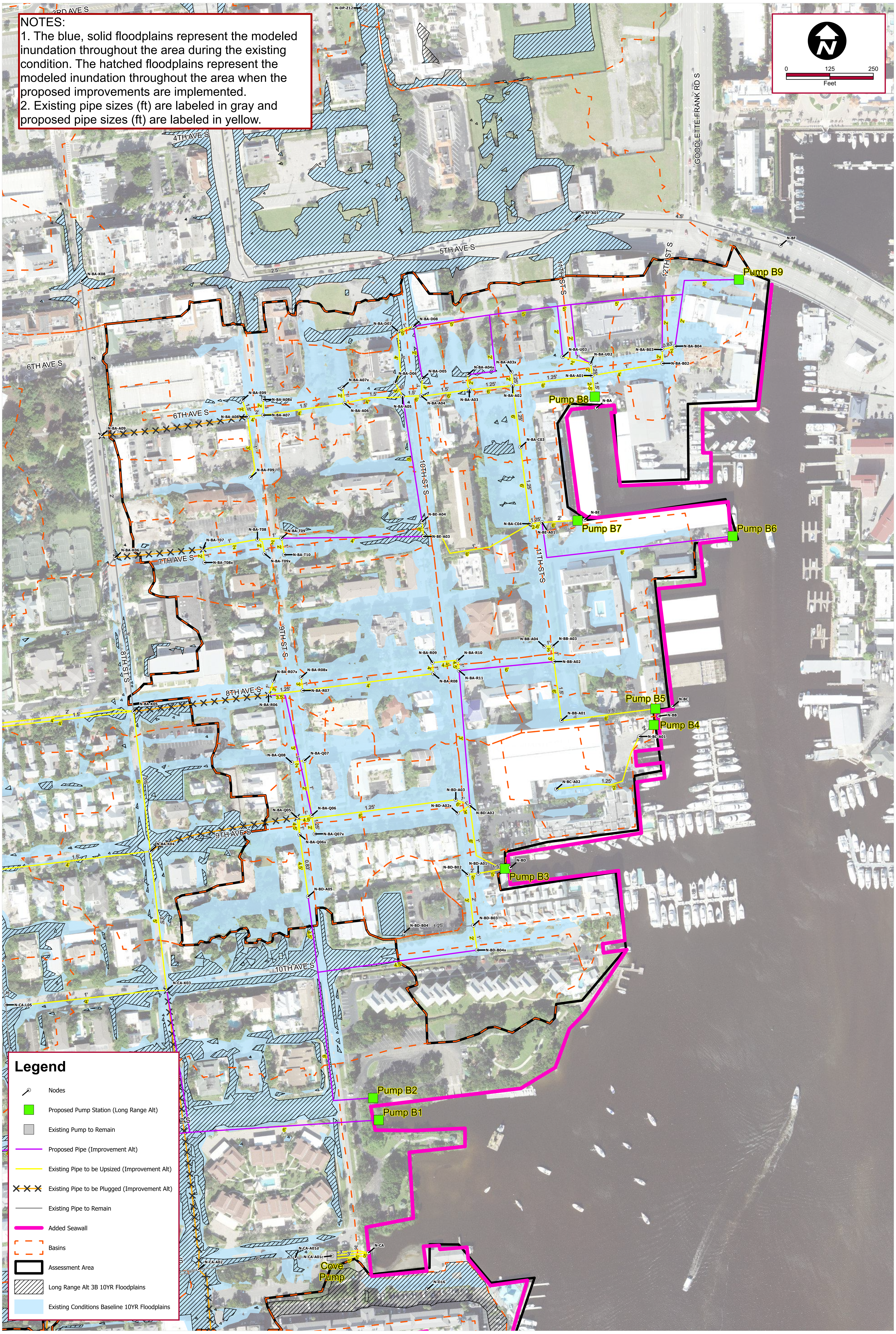
CITY OF NAPLES FLORIDA

LONG RANGE ALT 2B
EXISTING TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
25YR MODEL RESULTS

FIGURE
06-2B-25



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LONG RANGE ALT 3B
EXISTING TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
10YR MODEL RESULTS

FIGURE
06-3B-10

NOTES:
1. The blue, solid floodplains represent the modeled inundation throughout the area during the existing condition. The hatched floodplains represent the modeled inundation throughout the area when the proposed improvements are implemented.
2. Existing pipe sizes (ft) are labeled in gray and proposed pipe sizes (ft) are labeled in yellow.

Legend

- Nodes
- Proposed Pump Station (Long Range Alt)
- Existing Pump to Remain
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Existing Pipe to Remain
- Added Seawall
- Basins
- Assessment Area
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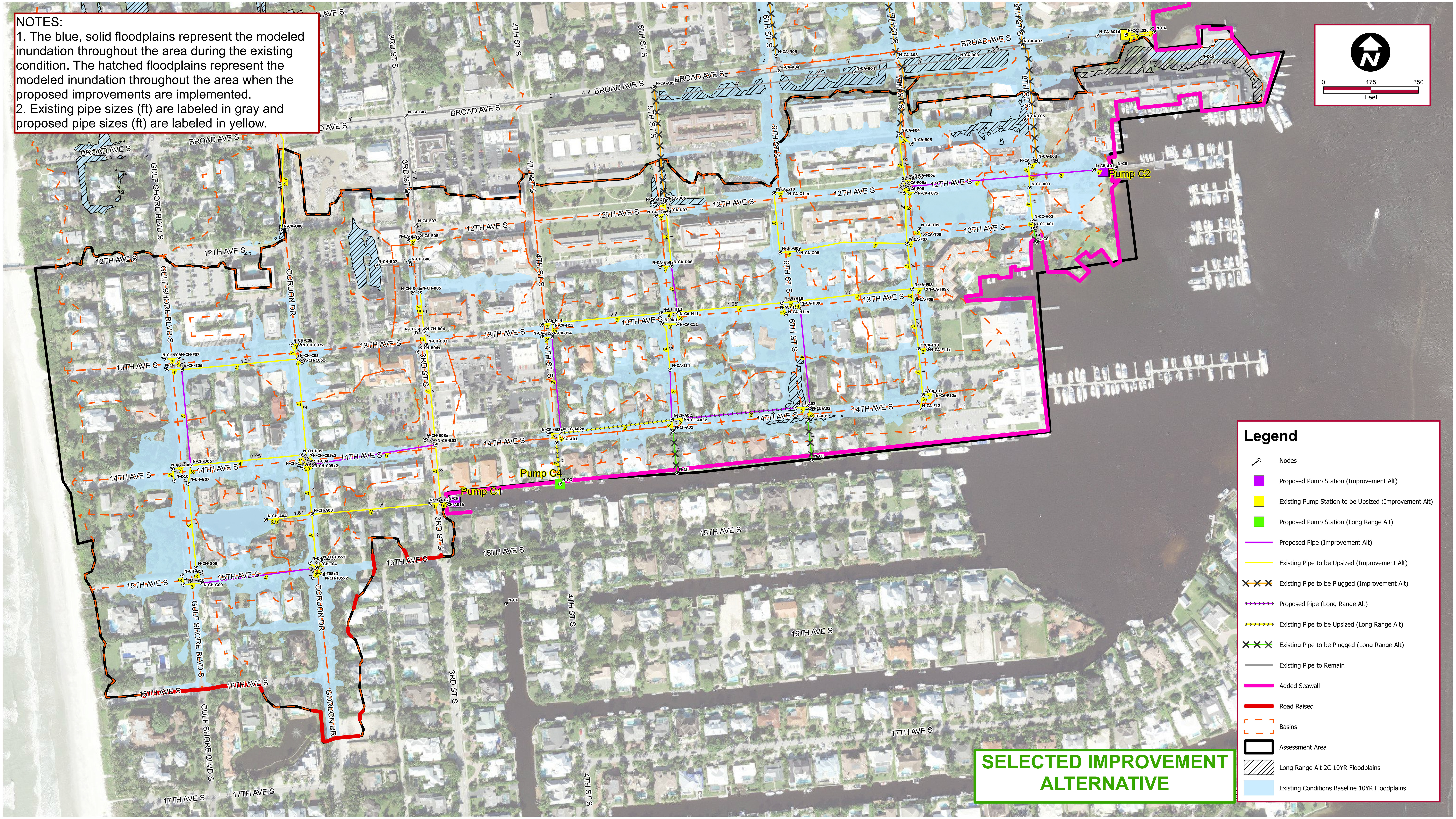
EXISTING TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
25YR MODEL RESULTS

FIGURE
06-3B-25

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\06 Long Range Alts with Existing Tailwater\Long_Range_Alts_EC\Long_Range_Alts_EC.aprx - 11/30/2023 1:51 PM - Henry Albright



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LONG RANGE ALT 2C
EXISTING TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
10YR MODEL RESULTS

FIGURE

06-2C-10

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\06 Long Range Alts with Existing Tailwater\Long_Range_Alts_EC\Long_Range_Alts_EC.aprx - 11/30/2023 1:57 PM - Henry.Albright

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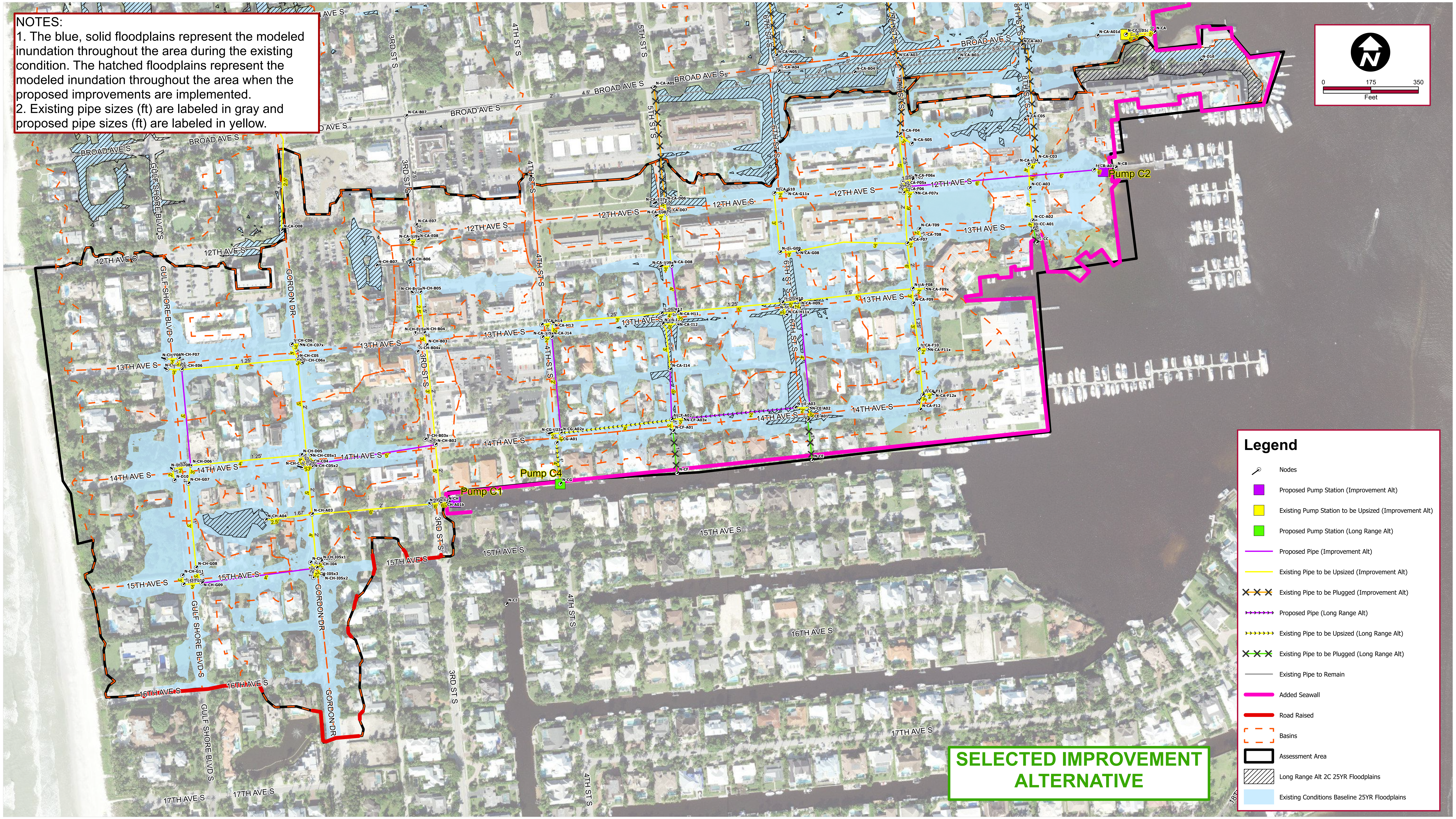

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EXISTING TAILWATER
UPSIZED TRUNKLINES &
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25YR MODEL RESULTS

FIGURE
06-2C-25

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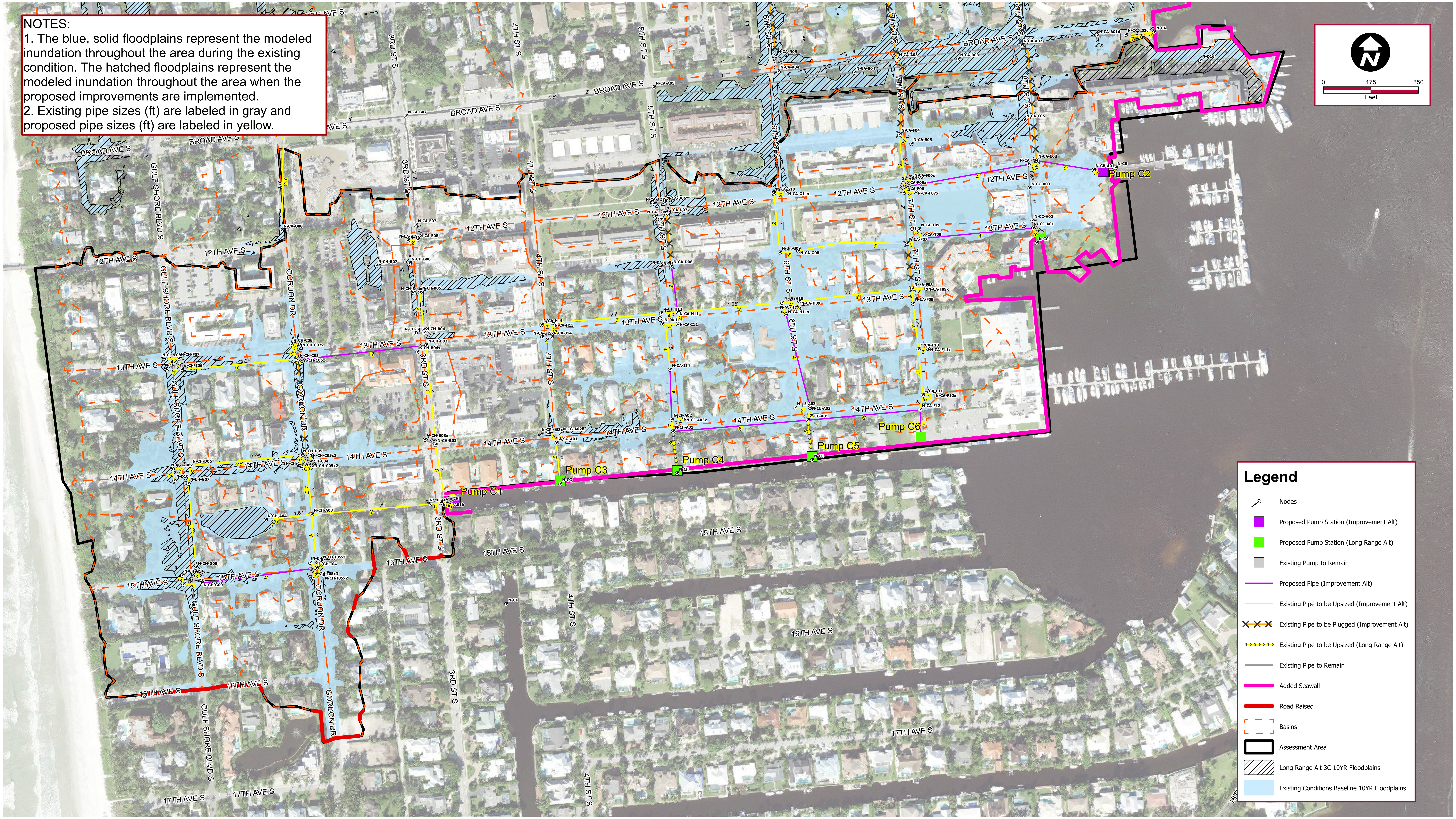

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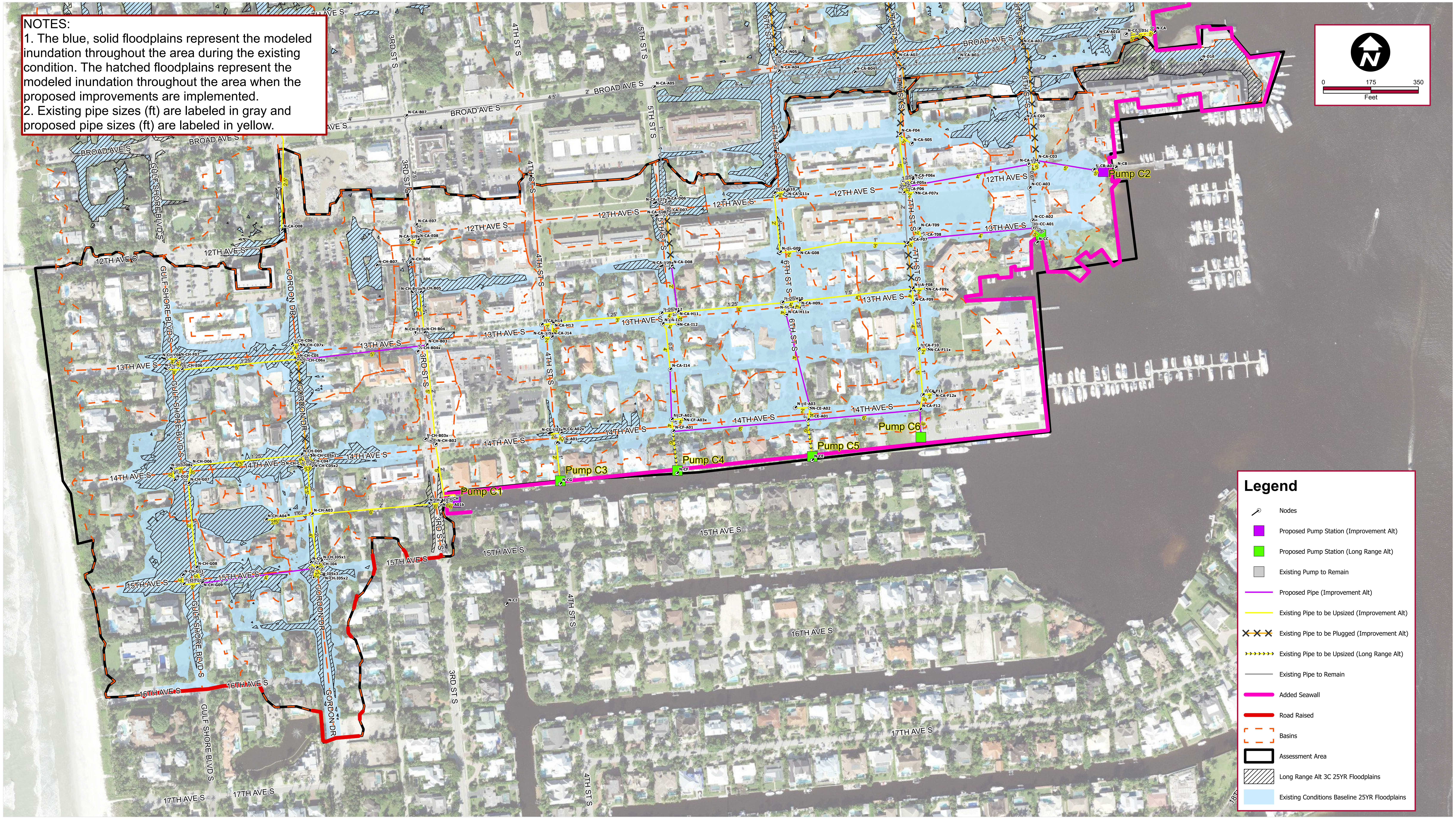
LONG RANGE ALT 3C
EXISTING TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
10YR MODEL RESULTS

FIGURE

06-3C-10



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LONG RANGE ALT 3C EXISTING TAILWATER UPSIZED TRUNKLINES & ADDED PUMPS 25YR MODEL RESULTS

FIGURE

06-3C-25

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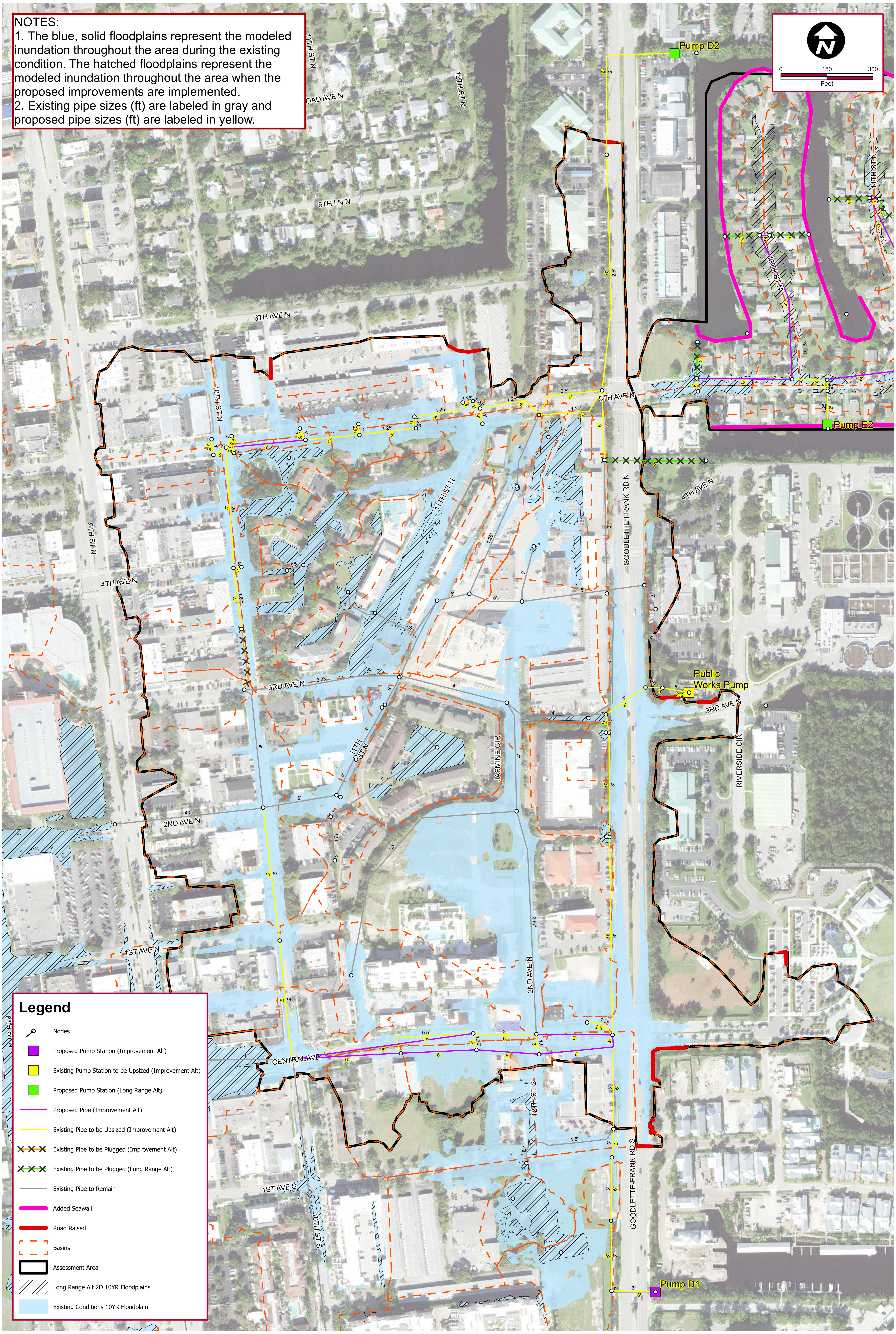

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LONG RANGE ALT 2D
EXISTING TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
10YR MODEL RESULTS

FIGURE
06-2D-10

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023 09 21\06 Long Range Alts with Existing Tailwater\Long_Range_Alts_EC\Long_Range_Alts_EC.aprx - 11/30/2023 1:54 PM - Henry Albright

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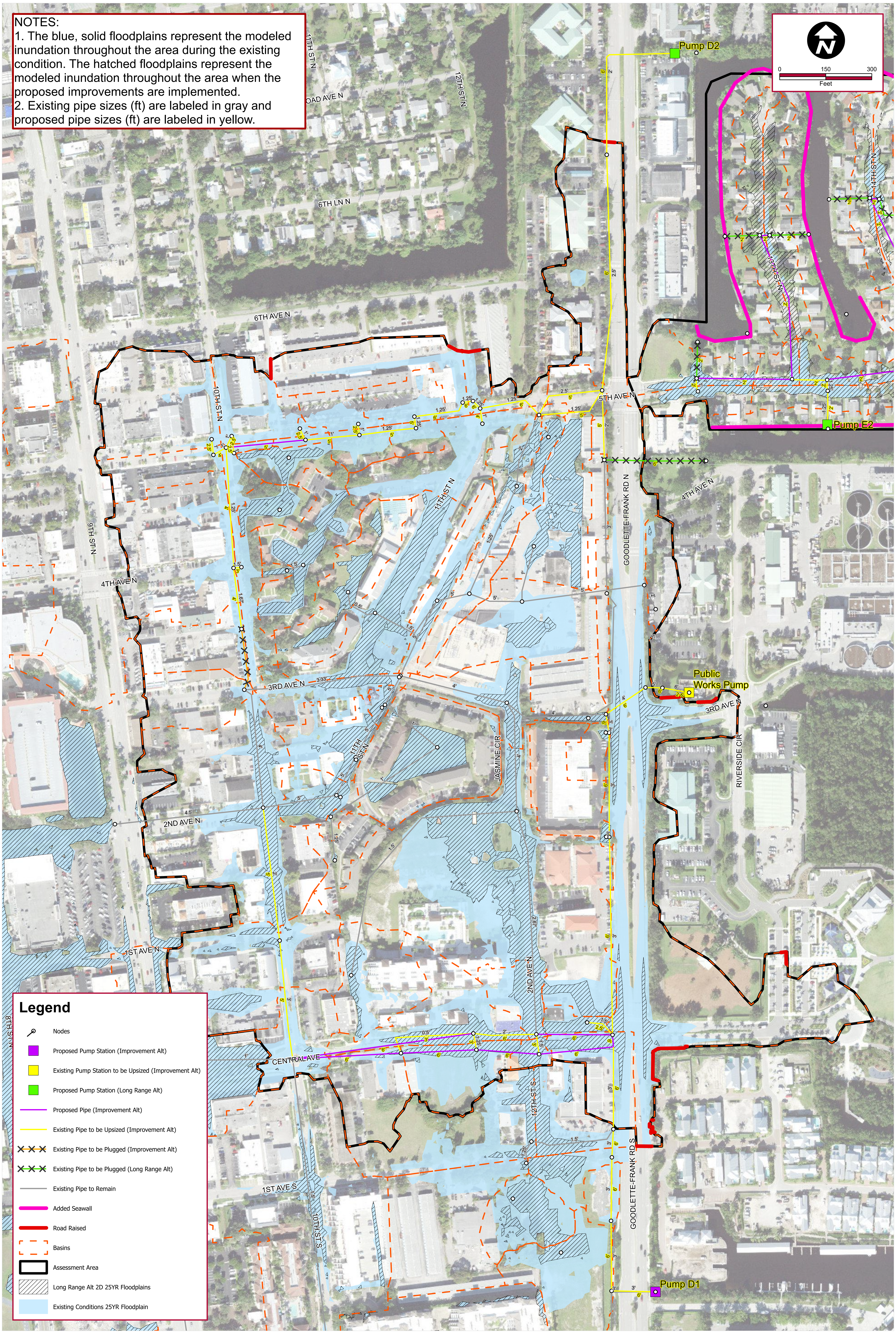

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LONG RANGE ALT 2D
EXISTING TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
25YR MODEL RESULTS

FIGURE
06-2D-25

NOTES:
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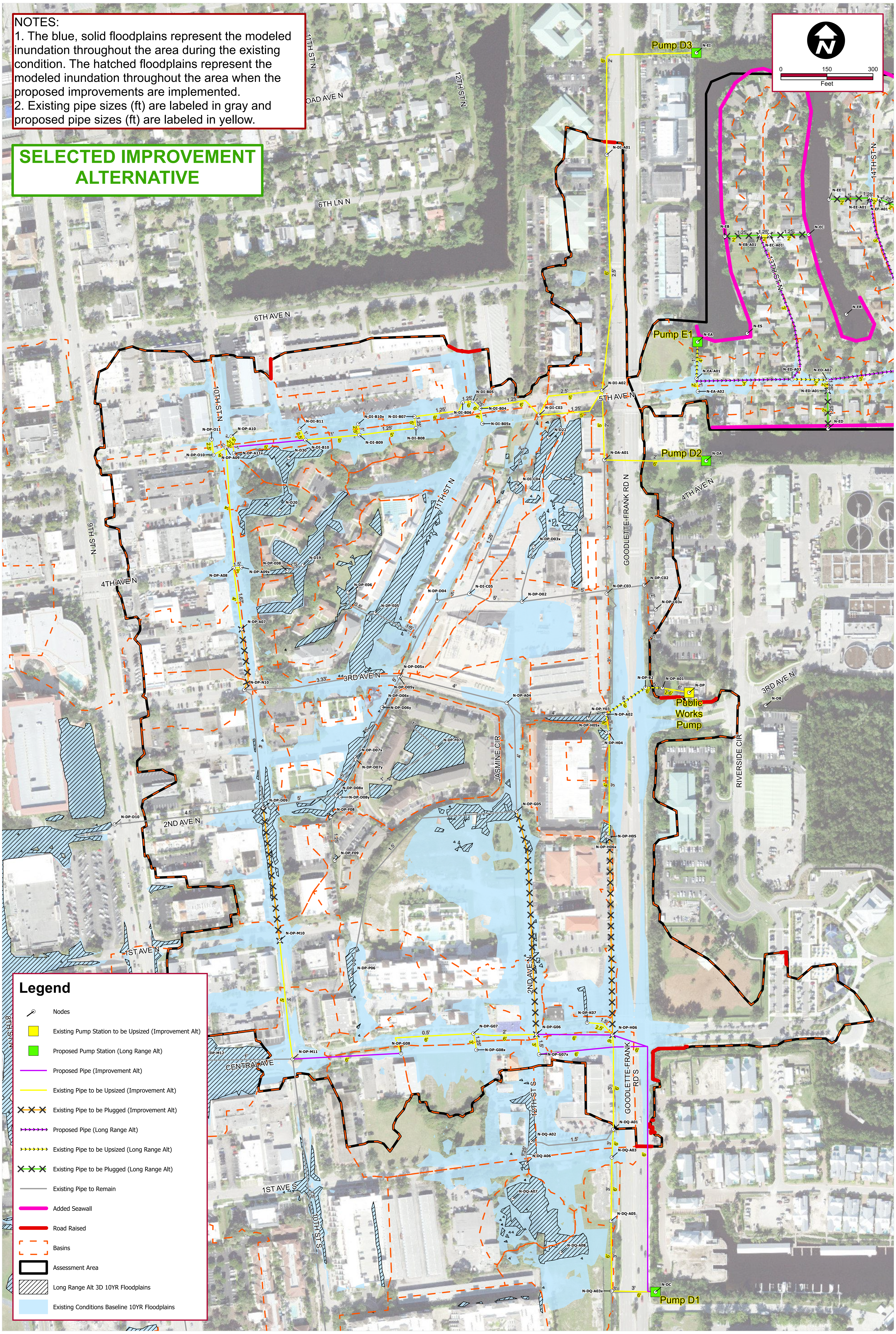
SELECTED IMPROVEMENT ALTERNATIVE



Legend

- Nodes
- Existing Pump Station to be Upsized (Improvement Alt)
- Proposed Pump Station (Long Range Alt)
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Proposed Pipe (Long Range Alt)
- Existing Pipe to be Upsized (Long Range Alt)
- Existing Pipe to be Plugged (Long Range Alt)
- Existing Pipe to Remain
- Added Seawall
- Road Raised
- Basins
- Assessment Area
- Long Range Alt 3D 10YR Floodplains
- Existing Conditions Baseline 10YR Floodplains

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LONG RANGE ALT 3D
EXISTING TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
10YR MODEL RESULTS

FIGURE
06-3D-10

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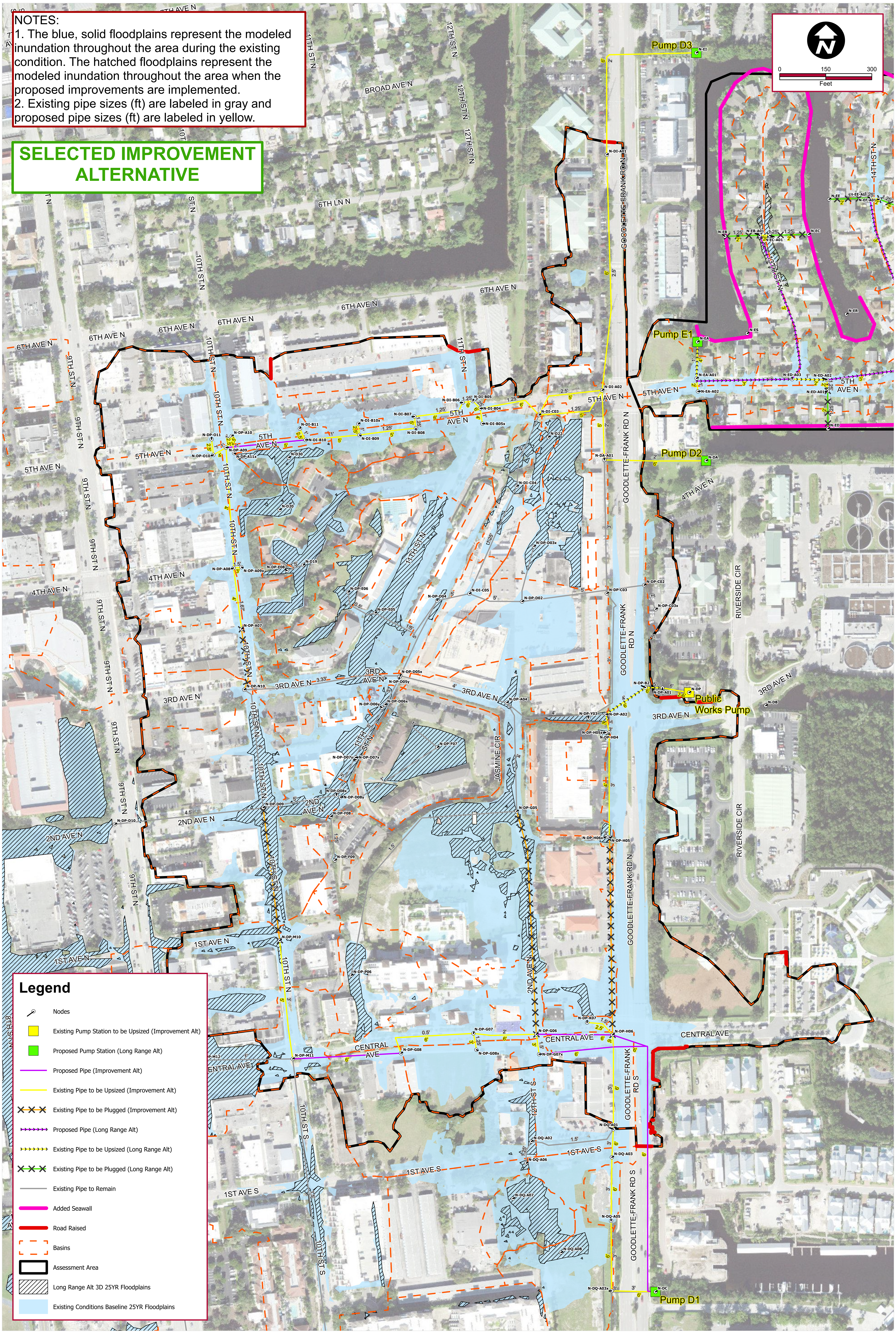

Legend

- Nodes
- Existing Pump Station to be Upsized (Improvement Alt)
- Proposed Pump Station (Long Range Alt)
- Proposed Pipe (Improvement Alt)
- Existing Pipe to be Upsized (Improvement Alt)
- Existing Pipe to be Plugged (Improvement Alt)
- Proposed Pipe (Long Range Alt)
- Existing Pipe to be Upsized (Long Range Alt)
- Existing Pipe to be Plugged (Long Range Alt)
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- Added Seawall
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- Assessment Area
- Long Range Alt 3D 25YR Floodplains
- Existing Conditions Baseline 25YR Floodplains

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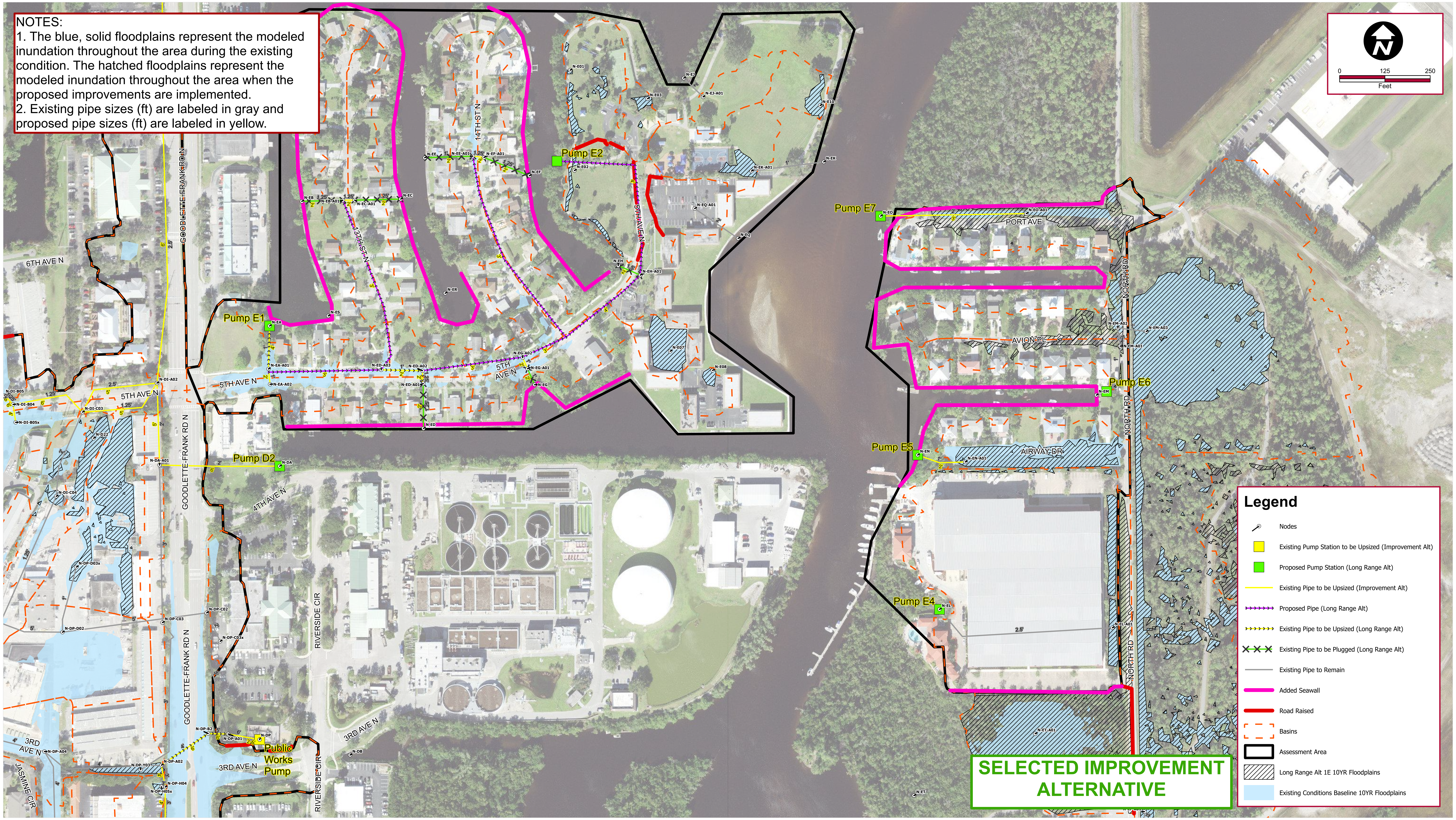
LONG RANGE ALT 3D
EXISTING TAILWATER
UPSIZED TRUNKLINES & ADDED PUMPS
25YR MODEL RESULTS

FIGURE
06-3D-25



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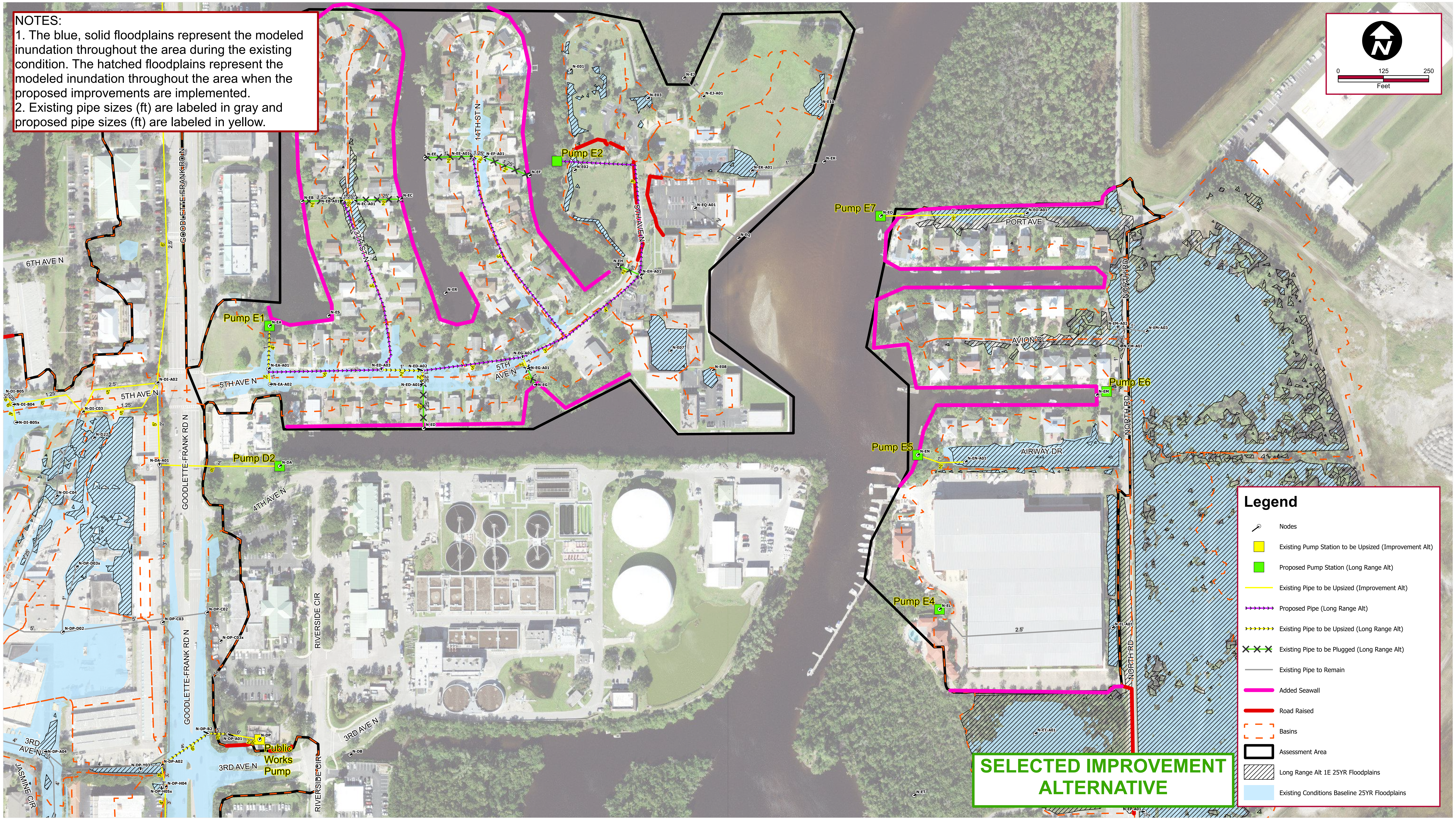
LONG RANGE ALT 1E EXISTING TAILWATER UPSIZED TRUNKLINES & ADDED PUMPS 10YR MODEL RESULTS

FIGURE

06-1E-10



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LONG RANGE ALT 1E
EXISTING TAILWATER
UPSIZED TRUNKLINES &
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25YR MODEL RESULTS

FIGURE

06-1E-25

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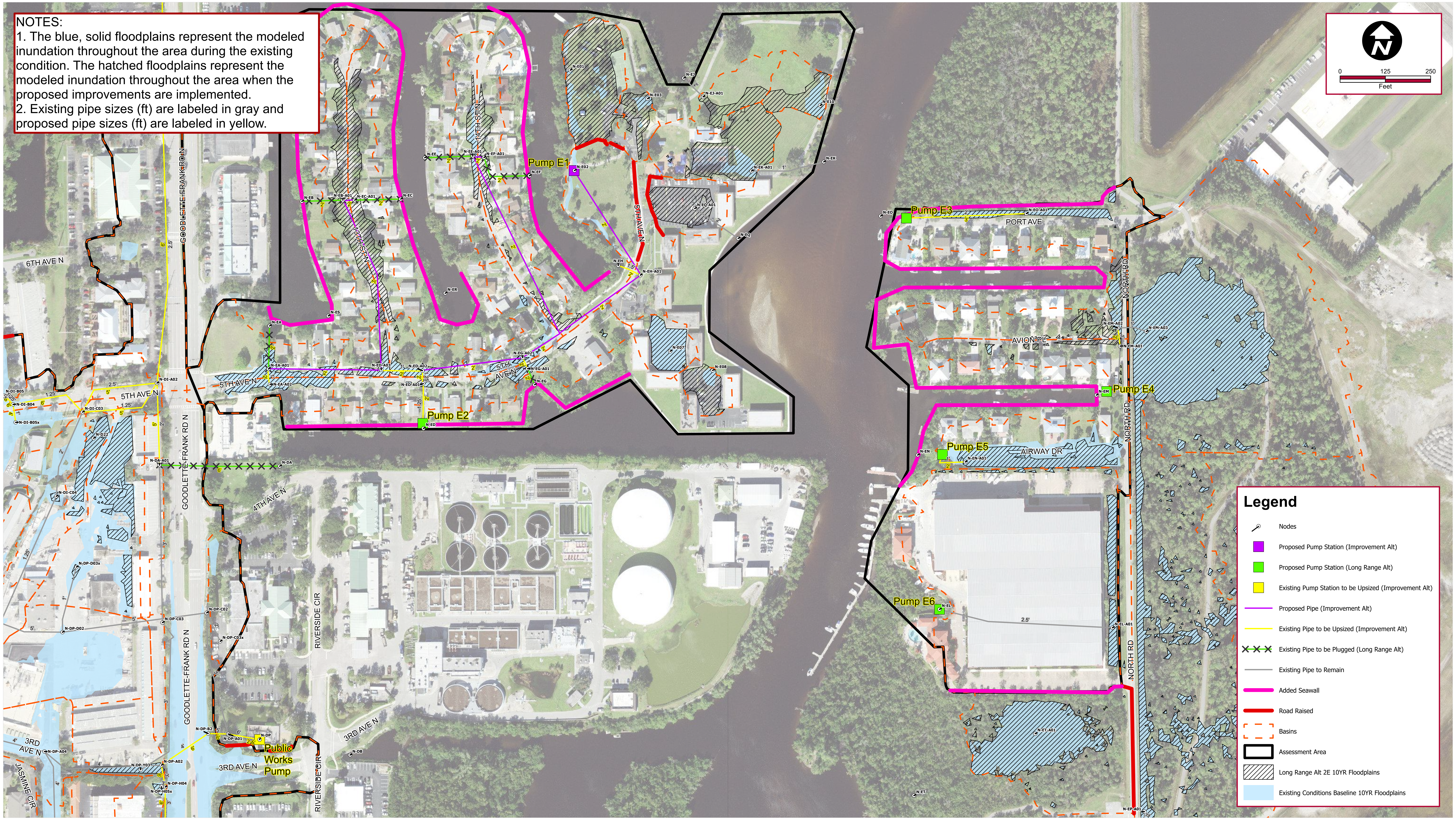

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LONG RANGE ALT 2E EXISTING TAILWATER UPSIZED TRUNKLINES & ADDED PUMPS 10YR MODEL RESULTS

FIGURE

06-2E-10

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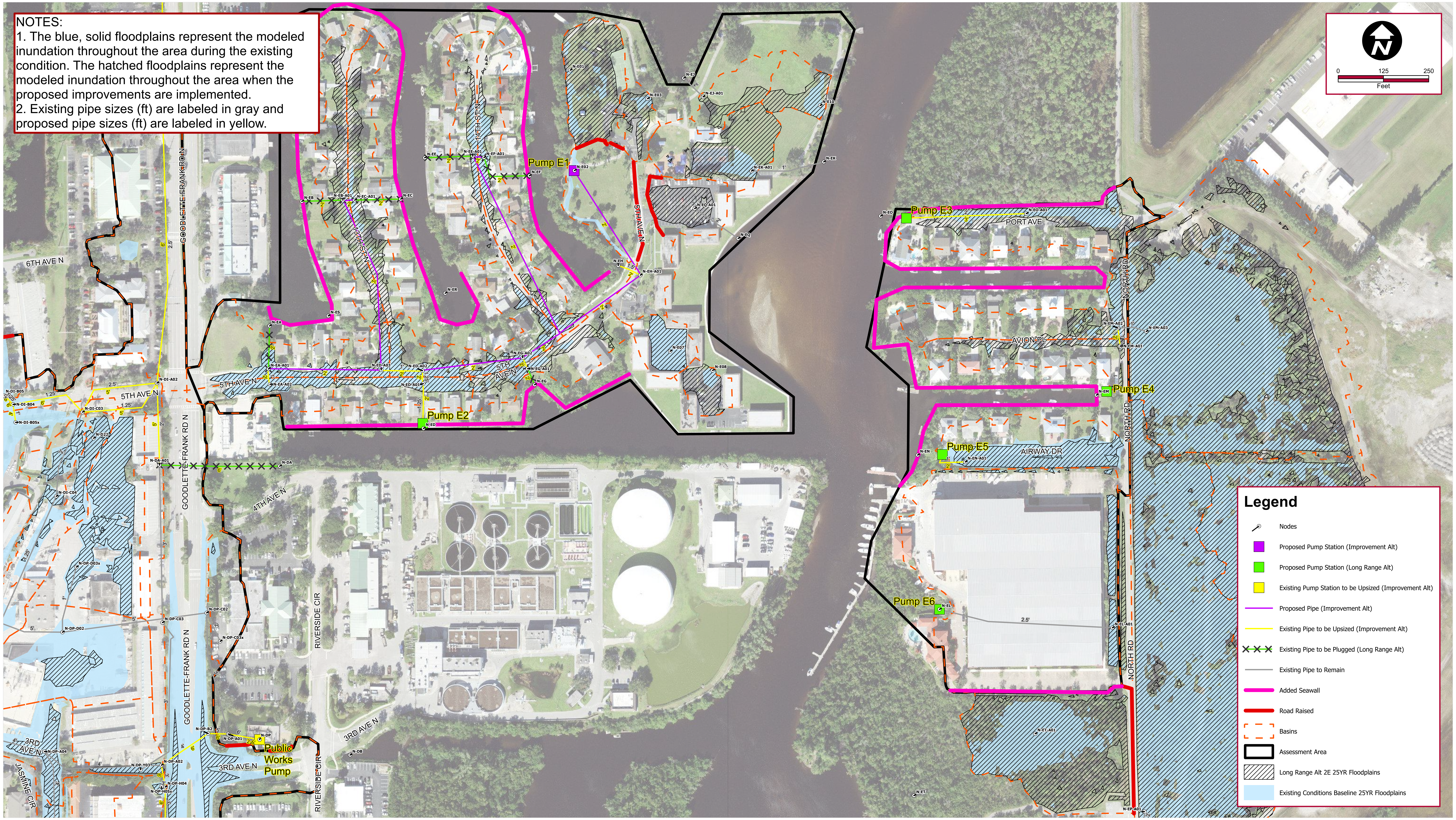

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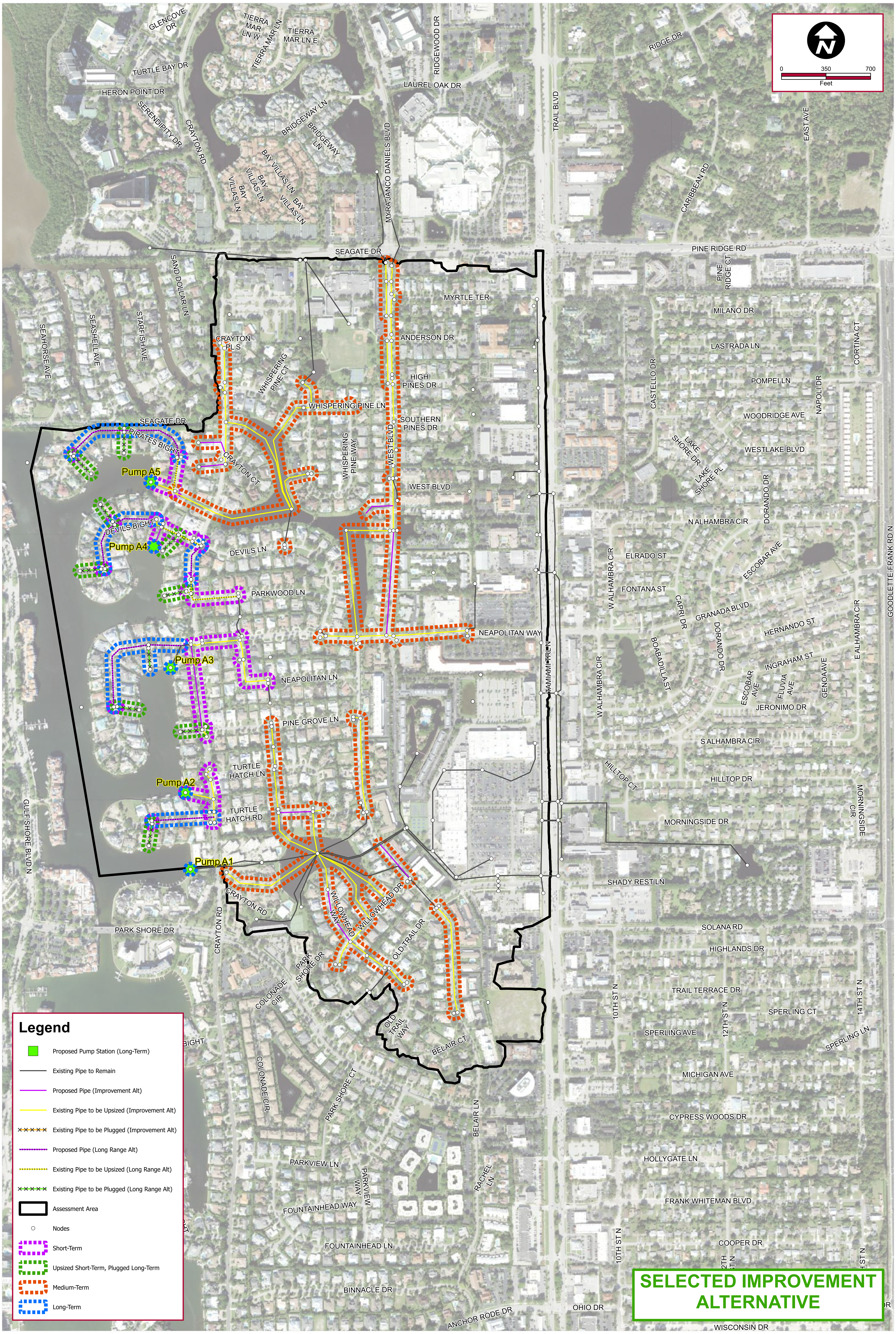
EXISTING TAILWATER
UPSIZED TRUNKLINES &
ADDED PUMPS
25YR MODEL RESULTS

FIGURE 06-2E-25

CIP Phasing Maps



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CIP RECOMMENDATIONS MAP
ASSESSMENT AREA A

FIGURE
7-3-A

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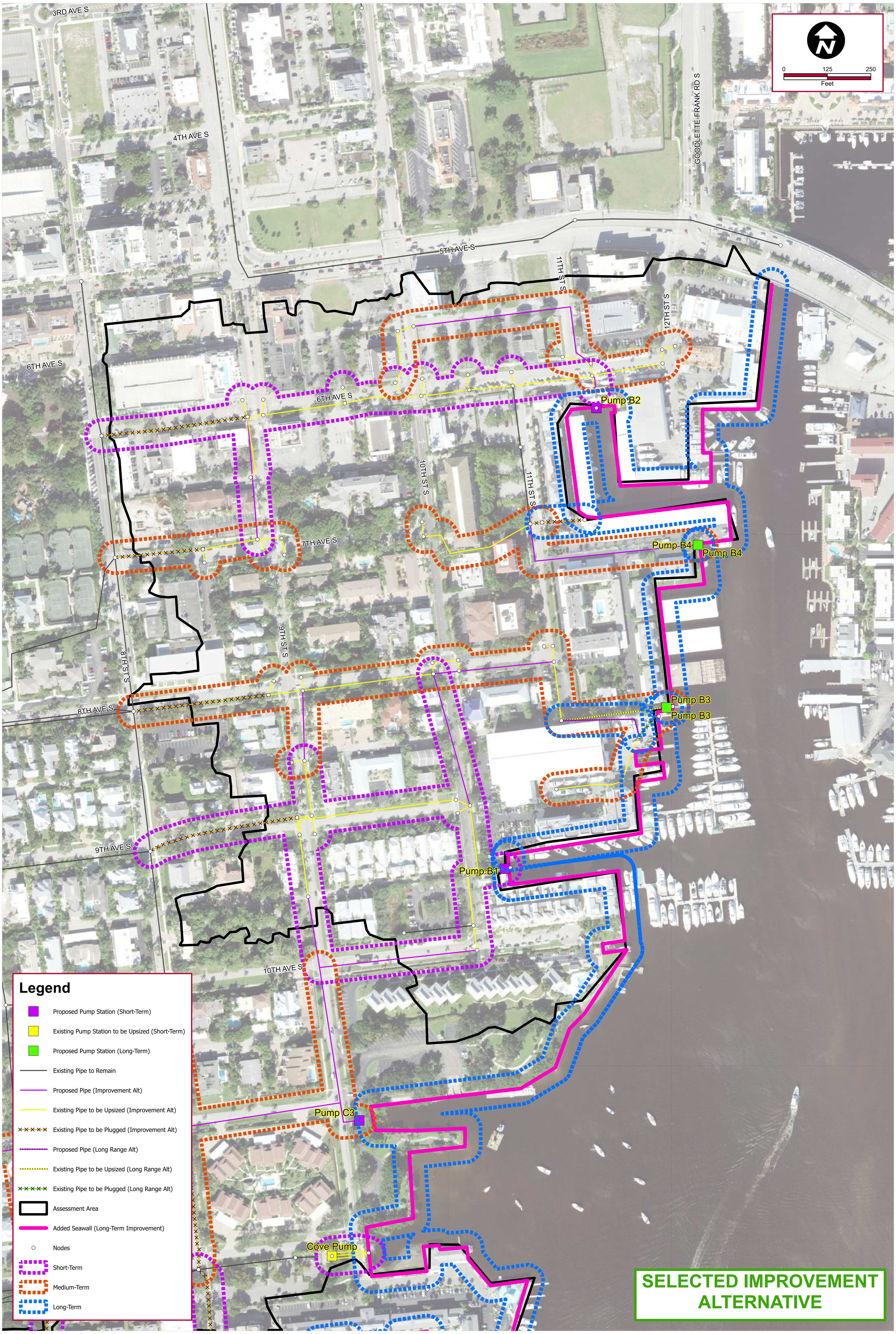

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CIP RECOMMENDATIONS MAP
ASSESSMENT AREA B

FIGURE
7-3-B

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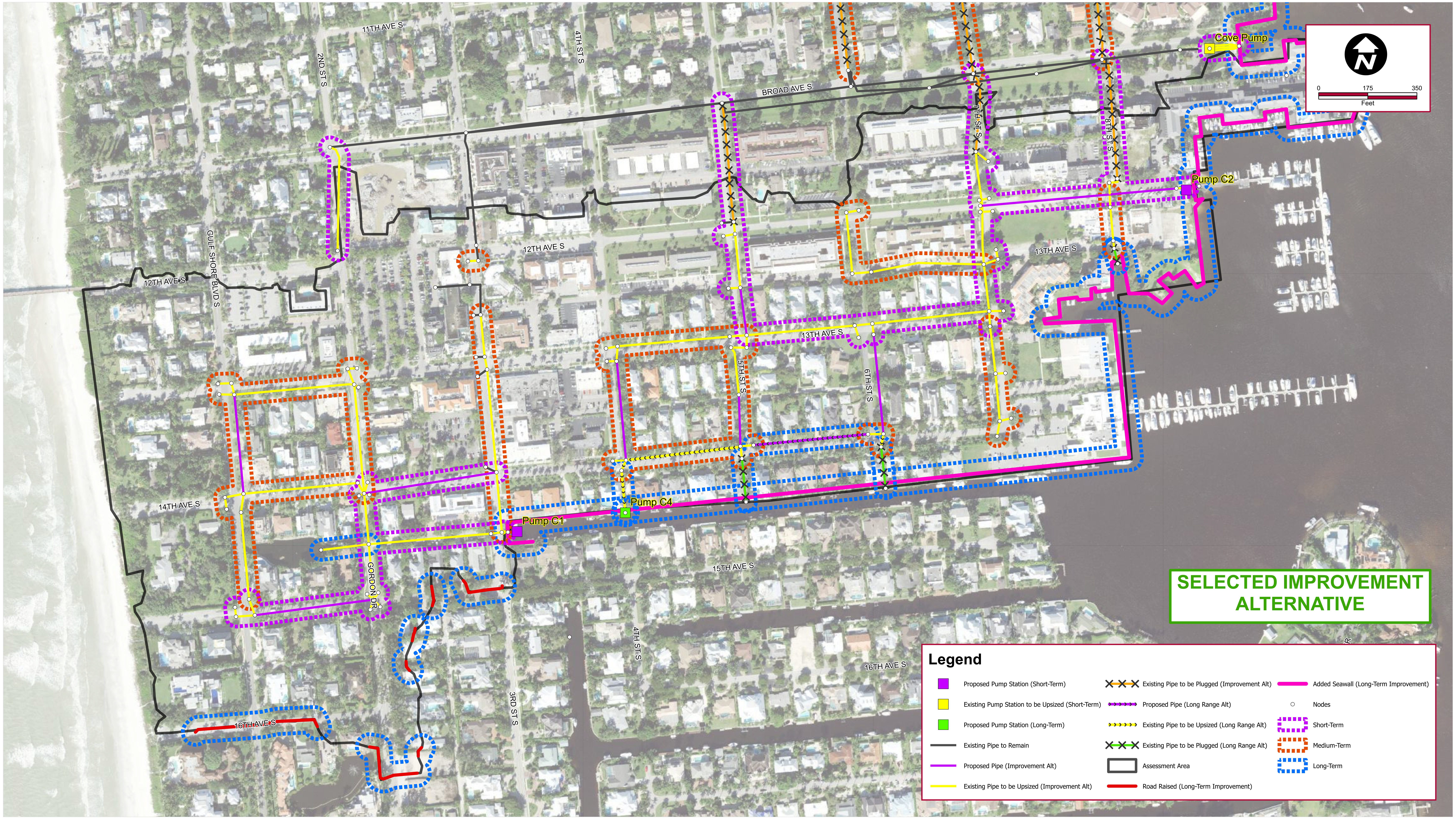

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CIP RECOMMENDATIONS MAP
ASSESSMENT AREA C

FIGURE
7-3-C

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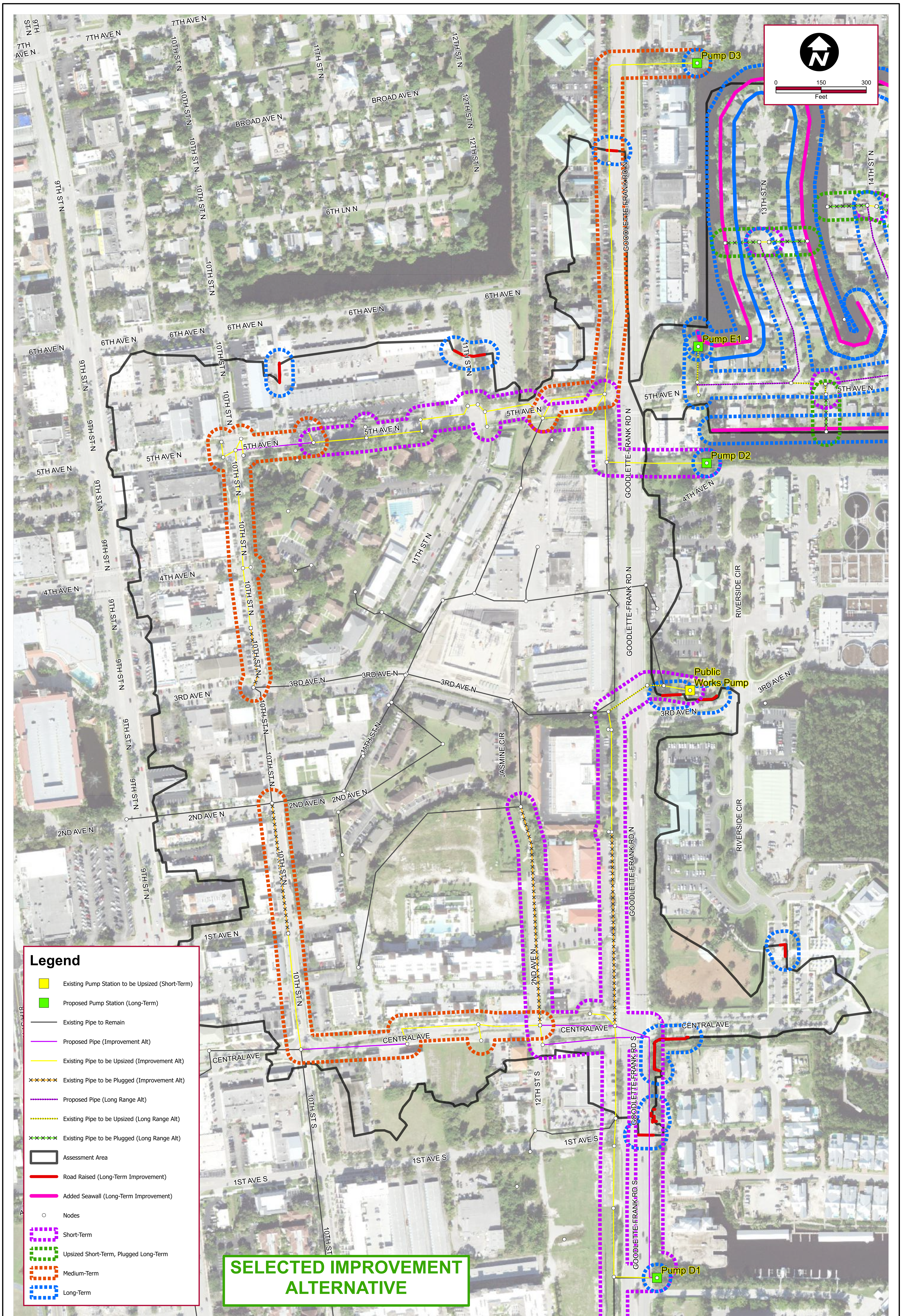


No.	REVISIONS	DATE	BY

Kimley»Horn

1514 BROADWAY, SUITE 301, FORT MYERS, FL 33901
PHONE: 239-271-2650 FAX: 941-379-4352
WWW.KIMLEY-HORN.COM REGISTRY No. 35106

KHA PROJECT 048320007
DATE JANUARY 2024
SCALE AS SHOWN
DESIGNED BY KHA
DRAWN BY KHA
CHECKED BY KHA

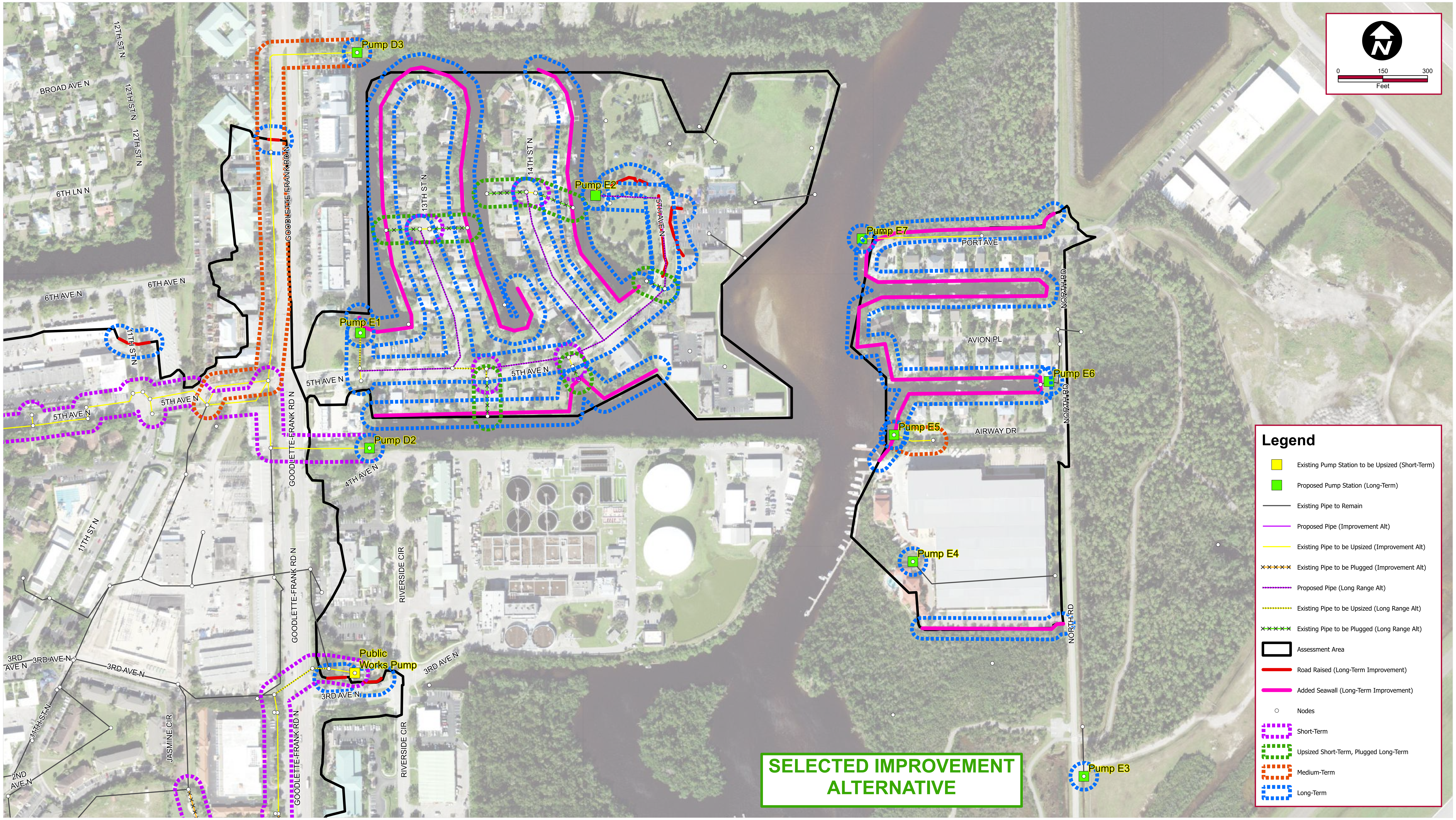
BASINS ASSESSMENT
PREPARED FOR
CITY OF NAPLES

CITY OF NAPLES FLORIDA

CIP RECOMMENDATIONS MAP
ASSESSMENT AREA D

FIGURE
7-3-D

K:\FTM_GIS_Project\048320007_Naples_Basin_Assessment\aprx_FINAL MAPS FOR REPORT 2023.09.21\CIP Phasing\CIP_Phasing.aprx - 1/8/2024 6:21 PM - lilybyrne



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NAPLES BASINS ASSESSMENT

PREPARED FOR

CITY OF NAPLES

CITY OF NAPLES FLORIDA

CIP RECOMMENDATIONS MAP ASSESSMENT AREA E

FIGURE 7-3-E

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Engineer’s Opinion of Probable Costs

Kimley»Horn

ITEM	DESCRIPTION	ESTIMATED QUANTITY		UNIT PRICE	AMOUNT
ENGINEER'S OPINION OF PROBABLE COST Assessment Area A - Selected Alternatives January 2024					
EARTHWORK-CLEAR-GRUB-GRADE					
1	Reconstruction of Disturbed Area (Non-Road)	11681	SY	$ 12.00	$ 140,172.00
2	Reconstruction of Disturbed Area (Paved Road)	17520	SY	$ 45.00	$ 788,400.00
				TOTAL	**$ 928,572.00**
STORM WATER					
3	15" RCP	23	LF	$ 245.00	$ 5,635.00
4	18" RCP	491	LF	$ 150.00	$ 73,650.00
5	24" RCP	2194	LF	$ 170.00	$ 372,980.00
6	30" RCP	3205	LF	$ 240.00	$ 769,200.00
7	36" RCP	2810	LF	$ 310.00	$ 871,100.00
8	42" RCP	2253	LF	$ 390.00	$ 878,670.00
9	48" RCP	7458	LF	$ 450.00	$ 3,356,100.00
10	54" RCP	579	LF	$ 500.00	$ 289,500.00
11	60" RCP	1877	LF	$ 600.00	$ 1,126,200.00
12	72" RCP	260	LF	$ 800.00	$ 208,000.00
13	FDOT Type 5 Curb Inlet	114	EA	$ 10,000.00	$ 1,140,000.00
14	FDOT Type D Inlet	11	EA	$ 9,000.00	$ 99,000.00
15	Manhole	41	EA	$ 8,000.00	$ 328,000.00
				TOTAL	**$ 9,518,035.00**
				SUBTOTAL	**$ 10,446,607.00**
MISCELLANEOUS					
16	Erosion Control and Dewatering (20% Subtotal)	1	LS	$ 2,089,321.40	$ 2,089,321.40
17	Geotechnical and Survey (5% Subtotal)	1	LS	$ 522,330.35	$ 522,330.35
18	Maintenance of Traffic (5% Subtotal)	1	LS	$ 522,330.35	$ 522,330.35
19	Demolition and Site Preparation (10% Subtotal)	1	LS	$ 1,044,660.70	$ 1,044,660.70
20	Mobilization and Demobilization (10% Subtotal)	1	LS	$ 1,044,660.70	$ 1,044,660.70
21	Headwalls and Mitered Ends for Pipes (2% Subtotal)	1	LS	$ 208,932.14	$ 208,932.14
				TOTAL	**$ 5,432,235.64**

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ENGINEER'S OPINION OF PROBABLE COST Assessment Area A - Selected Alternatives January 2024							
ITEM	**DESCRIPTION**	**ESTIMATED QUANTITY**		**UNIT PRICE**		**AMOUNT**	
EASEMENT ACQUISITION							
22	Parcel 16050280000	1	EA	$	129,564.00	$	129,564.00
23	Parcel 16050240008	1	EA	$	43,188.00	$	43,188.00
24	Parcel 16058120007	1	EA	$	185,952.00	$	185,952.00
25	Parcel 16060240001	1	EA	$	79,032.00	$	79,032.00
26	Parcel 16060200009	1	EA	$	79,032.00	$	79,032.00
27	Parcel 16060160000	1	EA	$	86,094.00	$	86,094.00
28	Parcel 16060120008	1	EA	$	86,094.00	$	86,094.00
					TOTAL	**$**	**688,956.00**
					SUBTOTAL WITH MISCELLANEOUS AND LAND ACQUISTION	**$**	**16,567,798.64**
					20% CONTINGENCY	**$**	**3,313,559.73**
					TOTAL CONSTRUCTION COST	**$**	**19,881,358.37**

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ENGINEER'S OPINION OF PROBABLE COST Assessment Area B - Selected Alternatives January 2024					
ITEM	**DESCRIPTION**	**ESTIMATED QUANTITY**		**UNIT PRICE**	**AMOUNT**
EARTHWORK-CLEAR-GRUB-GRADE					
1	Reconstruction of Disturbed Area (Non-Road)	1848	SY	$ 12.00	$ 22,176.00
2	Reconstruction of Disturbed Area (Paved Road)	16616	SY	$ 45.00	$ 747,720.00
				TOTAL	**$ 769,896.00**
STORM WATER					
3	Plugging/Disconnecting Pipe	2916	LF	$ 500.00	$ 1,458,000.00
4	24" RCP	2194	LF	$ 170.00	$ 372,980.00
5	36" RCP	752	LF	$ 240.00	$ 180,480.00
6	42" RCP	996	LF	$ 390.00	$ 388,440.00
7	48" RCP	1066	LF	$ 450.00	$ 479,700.00
8	54" RCP	2176	LF	$ 500.00	$ 1,088,000.00
9	72" RCP	4338	LF	$ 800.00	$ 3,470,400.00
10	FDOT Type 5 Curb Inlet	12	EA	$ 10,000.00	$ 120,000.00
11	FDOT Type D Inlet	61	EA	$ 9,000.00	$ 549,000.00
12	Manhole	12	EA	$ 8,000.00	$ 96,000.00
13	Pump Station (3 Phase Power Available)	2	EA	$ 9,200,000.00	$ 18,400,000.00
				TOTAL	**$ 26,603,000.00**
				SUBTOTAL	**$ 27,372,896.00**
MISCELLANEOUS					
14	Erosion Control and Dewatering (20% Subtotal)	1	LS	$ 5,474,579.20	$ 5,474,579.20
15	Geotechnical and Survey (5% Subtotal)	1	LS	$ 1,368,644.80	$ 1,368,644.80
16	Maintenance of Traffic (5% Subtotal)	1	LS	$ 1,368,644.80	$ 1,368,644.80
17	Demolition and Site Preparation (10% Subtotal)	1	LS	$ 2,737,289.60	$ 2,737,289.60
18	Mobilization and Demobilization (10% Subtotal)	1	LS	$ 2,737,289.60	$ 2,737,289.60
19	Headwalls and Mitered Ends for Pipes (2% Subtotal)	1	LS	$ 547,457.92	$ 547,457.92
				SUBTOTAL WITH MISCELLANEOUS	**$ 41,606,801.92**
				20% CONTINGENCY	**$ 8,321,360.38**
				TOTAL CONSTRUCTION COST	**$ 49,928,162.30**

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ENGINEER'S OPINION OF PROBABLE COST
Assessment Area C - Selected Alternatives
January 2024

ITEM	DESCRIPTION	ESTIMATED QUANTITY		UNIT PRICE	AMOUNT
EARTHWORK-CLEAR-GRUB-GRADE					
1	Reconstruction of Disturbed Area (Non-Road)	5316	SY	$ 12.00	$ 63,792.00
2	Reconstruction of Disturbed Area (Paved Road)	12400	SY	$ 45.00	$ 558,000.00
				TOTAL	**$ 621,792.00**
STORM WATER					
3	Plugging/Disconnecting Pipe	1133	LF	$ 500.00	$ 566,500.00
4	12" RCP	43	LF	$ 365.00	$ 15,695.00
5	24" RCP	1614	LF	$ 170.00	$ 274,380.00
6	30" RCP	1113	LF	$ 240.00	$ 267,120.00
7	36" RCP	3877	LF	$ 310.00	$ 1,201,870.00
8	48" RCP	2372	LF	$ 450.00	$ 1,067,400.00
9	54" RCP	44	LF	$ 500.00	$ 22,000.00
10	60" RCP	2326	LF	$ 600.00	$ 1,395,600.00
11	72" RCP	1513	LF	$ 800.00	$ 1,210,400.00
12	FDOT Type 5 Curb Inlet	11	EA	$ 10,000.00	$ 110,000.00
13	FDOT Type D Inlet	66	EA	$ 9,000.00	$ 594,000.00
14	Manhole	15	EA	$ 8,000.00	$ 120,000.00
15	Pump Station (3 Phase Power Available)	2	EA	$ 9,200,000.00	$ 18,400,000.00
16	Pump Station (3 Phase Power Unavailable)	2	EA	$ 10,400,000.00	$ 20,800,000.00
				TOTAL	**$ 46,044,965.00**
				SUBTOTAL	**$ 46,666,757.00**
MISCELLANEOUS					
1	Erosion Control and Dewatering (20% Subtotal)	1	LS	$ 9,333,351.40	$ 9,333,351.40
2	Geotechnical and Survey (5% Subtotal)	1	LS	$ 2,333,337.85	$ 2,333,337.85
3	Maintenance of Traffic (5% Subtotal)	1	LS	$ 2,333,337.85	$ 2,333,337.85
4	Demolition and Site Preparation (10% Subtotal)	1	LS	$ 4,666,675.70	$ 4,666,675.70
5	Mobilization and Demobilization (10% Subtotal)	1	LS	$ 4,666,675.70	$ 4,666,675.70
6	Headwalls and Mitered Ends for Pipes (2% Subtotal)	1	LS	$ 933,335.14	$ 933,335.14
				SUBTOTAL WITH MISCELLANEOUS	**$ 70,933,470.64**
				20% CONTINGENCY	**$ 14,186,694.13**
				TOTAL CONSTRUCTION COST	**$ 85,120,164.77**

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ENGINEER'S OPINION OF PROBABLE COST Assessment Area D - Selected Alternatives January 2024								
ITEM	DESCRIPTION	ESTIMATED QUANTITY		UNIT PRICE		AMOUNT		
EARTHWORK-CLEAR-GRUB-GRADE								
1	Reconstruction of Disturbed Area (Non-Road)	1609	SY	$	12.00	$	19,308.00	
2	Reconstruction of Disturbed Area (Paved Road)	14470	SY	$	45.00	$	651,150.00	
					TOTAL	**$**	**670,458.00**	
STORM WATER								
3	Plugging/Disconnecting Pipe	2008	LF	$	500.00	$	1,004,000.00	
4	30" RCP	3205	LF	$	240.00	$	769,200.00	
5	36" RCP	144	LF	$	310.00	$	44,640.00	
6	48" RCP	1088	LF	$	450.00	$	489,600.00	
7	60" RCP	1721	LF	$	600.00	$	1,032,600.00	
8	72" RCP	5306	LF	$	800.00	$	4,244,800.00	
9	FDOT Type 5 Curb Inlet	31	EA	$	10,000.00	$	310,000.00	
10	FDOT Type D Inlet	8	EA	$	9,000.00	$	72,000.00	
11	Manhole	16	EA	$	8,000.00	$	128,000.00	
12	Pump Station (3 Phase Power Available)	1	EA	$	9,200,000.00	$	9,200,000.00	
					TOTAL	**$**	**17,294,840.00**	
					SUBTOTAL	**$**	**17,965,298.00**	
MISCELLANEOUS								
1	Erosion Control and Dewatering (20% Subtotal)	1	LS	$	3,593,059.60	$	3,593,059.60	
2	Geotechnical and Survey (5% Subtotal)	1	LS	$	898,264.90	$	898,264.90	
3	Maintenance of Traffic (5% Subtotal)	1	LS	$	898,264.90	$	898,264.90	
4	Demolition and Site Preparation (10% Subtotal)	1	LS	$	1,796,529.80	$	1,796,529.80	
5	Mobilization and Demobilization (10% Subtotal)	1	LS	$	1,796,529.80	$	1,796,529.80	
6	Headwalls and Mitered Ends for Pipes (2% Subtotal)	1	LS	$	359,305.96	$	359,305.96	
					SUBTOTAL WITH MISCELLANEOUS	**$**	**27,307,252.96**	
					20% CONTINGENCY	**$**	**5,461,450.59**	
					TOTAL CONSTRUCTION COST	**$**	**32,768,703.55**	

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ENGINEER'S OPINION OF PROBABLE COST Assessment Area E - Selected Alternatives January 2024					
ITEM	**DESCRIPTION**	**ESTIMATED QUANTITY**		**UNIT PRICE**	**AMOUNT**
EARTHWORK-CLEAR-GRUB-GRADE					
1	Reconstruction of Disturbed Area (Non-Road)	1174	SY	$ 12.00	$ 14,088.00
2	Reconstruction of Disturbed Area (Paved Road)	503	SY	$ 45.00	$ 22,635.00
				TOTAL	**$ 36,723.00**
STORM WATER					
3	24" RCP	1104	LF	$ 170.00	$ 187,680.00
4	36" RCP	405	LF	$ 310.00	$ 125,550.00
5	FDOT Type D Inlet	13	EA	$ 9,000.00	$ 117,000.00
				TOTAL	**$ 430,230.00**
				SUBTOTAL	**$ 466,953.00**
MISCELLANEOUS					
1	Erosion Control and Dewatering (20% Subtotal)	1	LS	$ 93,390.60	$ 93,390.60
2	Geotechnical and Survey (5% Subtotal)	1	LS	$ 23,347.65	$ 23,347.65
3	Maintenance of Traffic (5% Subtotal)	1	LS	$ 23,347.65	$ 23,347.65
4	Demolition and Site Preparation (10% Subtotal)	1	LS	$ 46,695.30	$ 46,695.30
5	Mobilization and Demobilization (10% Subtotal)	1	LS	$ 46,695.30	$ 46,695.30
6	Headwalls and Mitered Ends for Pipes (2% Subtotal)	1	LS	$ 9,339.06	$ 9,339.06
				SUBTOTAL WITH MISCELLANEOUS	**$ 709,768.56**
				20% CONTINGENCY	**$ 141,953.71**
				TOTAL CONSTRUCTION COST	**$ 851,722.27**

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ENGINEER'S OPINION OF PROBABLE COST Assessment Area A - Selected Long Range Alternatives January 2024					
ITEM	**DESCRIPTION**	**ESTIMATED QUANTITY**		**UNIT PRICE**	**AMOUNT**
EARTHWORK-CLEAR-GRUB-GRADE					
1	Reconstruction of Disturbed Area (Non-Road)	3200	SY	$ 12.00	$ 38,400.00
2	Reconstruction of Disturbed Area (Paved Road)	4800	SY	$ 45.00	$ 216,000.00
				TOTAL	**$ 254,400.00**
STORM WATER					
3	Plugging/Disconnecting Pipe	1730	LF	$ 500.00	$ 865,000.00
4	Pipe to be Placed	4710	LF	$ 380.00	$ 1,789,800.00
5	Structures (Inlets/Manholes)	30	EA	$ 9,000.00	$ 270,000.00
6	Pump Station (A1 - 240 cfs) - 3 Phase Power Unavailable	1	EA	$ 10,400,000.00	$ 10,400,000.00
7	Pump Station (A2 - 120 cfs) - 3 Phase Power Unavailable	1	EA	$ 8,680,000.00	$ 8,680,000.00
8	Pump Station (A3 - 250 cfs) - 3 Phase Power Unavailable	1	EA	$ 10,400,000.00	$ 10,400,000.00
9	Pump Station (A4 - 190 cfs) - 3 Phase Power Unavailable	1	EA	$ 10,400,000.00	$ 10,400,000.00
10	Pump Station (A5 - 190 cfs) - 3 Phase Power Unavailable	1	EA	$ 10,400,000.00	$ 10,400,000.00
				TOTAL	**$ 53,204,800.00**
				SUBTOTAL	**$ 53,459,000.00**
MISCELLANEOUS					
1	Erosion Control and Dewatering (20% Subtotal)	1	LS	$ 10,692,000.00	$ 10,692,000.00
2	Geotechnical and Survey (5% Subtotal)	1	LS	$ 2,673,000.00	$ 2,673,000.00
3	Maintenance of Traffic (5% Subtotal)	1	LS	$ 2,673,000.00	$ 2,673,000.00
4	Demolition and Site Preparation (10% Subtotal)	1	LS	$ 5,346,000.00	$ 5,346,000.00
5	Mobilization and Demobilization (10% Subtotal)	1	LS	$ 5,346,000.00	$ 5,346,000.00
6	Headwalls and Mitered Ends for Pipes (2% Subtotal)	1	LS	$ 1,069,000.00	$ 1,069,000.00
				SUBTOTAL WITH MISCELLANEOUS	**$ 81,258,000.00**
				20% CONTINGENCY	**$ 16,251,600.00**
				TOTAL CONSTRUCTION COST	**$ 97,510,000.00**

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ENGINEER'S OPINION OF PROBABLE COST Assessment Area B - Selected Long Range Alternatives January 2024							
ITEM	DESCRIPTION	ESTIMATED QUANTITY		UNIT PRICE		AMOUNT	
EARTHWORK-CLEAR-GRUB-GRADE							
1	Reconstruction of Disturbed Area (Non-Road)	1900	SY	$	12.00	$	22,800.00
2	Reconstruction of Disturbed Area (Paved Road)	16600	SY	$	45.00	$	747,000.00
3	Roads Raised	80	LF	$	150.00	$	12,000.00
4	Commerical Seawalls Added	6060	LF	$	4,000.00	$	24,240,000.00
					TOTAL	**$**	**25,021,800.00**
STORM WATER							
5	Plugging/Disconnecting Pipe	90	LF	$	500.00	$	45,000.00
6	Pipe to be Placed	410	LF	$	520.00	$	213,200.00
7	Structures (Inlets/Manholes)	5	EA	$	9,000.00	$	45,000.00
8	Pump Station (B3 - 25 cfs)	1	EA	$	3,080,000.00	$	3,080,000.00
9	Pump Station (B4 - 50 cfs)	1	EA	$	3,080,000.00	$	3,080,000.00
					TOTAL	**$**	**6,463,200.00**
					SUBTOTAL	**$**	**31,485,000.00**
MISCELLANEOUS							
1	Erosion Control and Dewatering (20% Subtotal)	1	LS	$	6,297,000.00	$	6,297,000.00
2	Geotechnical and Survey (5% Subtotal)	1	LS	$	1,574,000.00	$	1,574,000.00
3	Maintenance of Traffic (5% Subtotal)	1	LS	$	1,574,000.00	$	1,574,000.00
4	Demolition and Site Preparation (10% Subtotal)	1	LS	$	3,149,000.00	$	3,149,000.00
5	Mobilization and Demobilization (10% Subtotal)	1	LS	$	3,149,000.00	$	3,149,000.00
6	Headwalls and Mitered Ends for Pipes (2% Subtotal)	1	LS	$	630,000.00	$	630,000.00
					TOTAL	**$**	**16,373,000.00**
EASEMENT ACQUISITION							
1	Parcel 14051500008	1	EA	$	301,000.00	$	301,000.00
					TOTAL	**$**	**301,000.00**
					SUBTOTAL WITH MISCELLANEOUS AND LAND ACQUISTION	**$**	**48,159,000.00**
					20% CONTINGENCY	**$**	**9,631,800.00**
					TOTAL CONSTRUCTION COST	**$**	**57,791,000.00**

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ENGINEER'S OPINION OF PROBABLE COST Assessment Area C - Selected Long Range Alternatives January 2024							
ITEM	DESCRIPTION	ESTIMATED QUANTITY		UNIT PRICE		AMOUNT	
EARTHWORK-CLEAR-GRUB-GRADE							
1	Reconstruction of Disturbed Area (Non-Road)	5300	SY	$	12.00	$	63,600.00
2	Reconstruction of Disturbed Area (Paved Road)	12400	SY	$	45.00	$	558,000.00
3	Roads Raised	1070	LF	$	150.00	$	160,500.00
4	Residential Seawalls Added	4600	LF	$	2,000.00	$	9,200,000.00
5	Commerical Seawalls Added	1800	LF	$	4,000.00	$	7,200,000.00
					TOTAL	**$**	**17,182,100.00**
STORM WATER							
6	Plugging/Disconnecting Pipe	360	LF	$	500.00	$	180,000.00
7	Pipe to be Placed	1060	LF	$	425.00	$	450,500.00
8	Structures (Inlets/Manholes)	10	EA	$	9,000.00	$	90,000.00
9	Pump Station (C4 -75 cfs)	1	EA	$	6,140,000.00	$	6,140,000.00
					TOTAL	**$**	**6,860,500.00**
					SUBTOTAL	**$**	**24,043,000.00**
MISCELLANEOUS							
1	Erosion Control and Dewatering (20% Subtotal)	1	LS	$	4,809,000.00	$	4,809,000.00
2	Geotechnical and Survey (5% Subtotal)	1	LS	$	1,202,000.00	$	1,202,000.00
3	Maintenance of Traffic (5% Subtotal)	1	LS	$	1,202,000.00	$	1,202,000.00
4	Demolition and Site Preparation (10% Subtotal)	1	LS	$	2,404,000.00	$	2,404,000.00
5	Mobilization and Demobilization (10% Subtotal)	1	LS	$	2,404,000.00	$	2,404,000.00
6	Headwalls and Mitered Ends for Pipes (2% Subtotal)	1	LS	$	481,000.00	$	481,000.00
					SUBTOTAL WITH MISCELLANEOUS	**$**	**36,545,000.00**
					20% CONTINGENCY	**$**	**7,309,000.00**
					TOTAL CONSTRUCTION COST	**$**	**43,854,000.00**

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Kimley»Horn

ITEM	DESCRIPTION	ESTIMATED QUANTITY		UNIT PRICE	AMOUNT
ENGINEER'S OPINION OF PROBABLE COST Assessment Area D - Selected Long Range Alternatives January 2024					
EARTHWORK-CLEAR-GRUB-GRADE					
1	Reconstruction of Disturbed Area (Non-Road)	200	SY	$ 12.00	$ 2,400.00
2	Reconstruction of Disturbed Area (Paved Road)	200	SY	$ 45.00	$ 9,000.00
3	Roads Raised	700	LF	$ 150.00	$ 105,000.00
				TOTAL	**$ 116,400.00**
STORM WATER					
4	Pipe to be Placed	210	LF	$ 575.00	$ 120,750.00
5	Structures (Inlets/Manholes)	5	EA	$ 9,000.00	$ 45,000.00
6	Pump Station (D1 - 400 cfs)	1	EA	$ 15,340,000.00	$ 15,340,000.00
7	Pump Station (D2 - 100 cfs)	1	EA	$ 7,680,000.00	$ 7,680,000.00
8	Pump Station (D3 - 100 cfs)	1	EA	$ 7,680,000.00	$ 7,680,000.00
				TOTAL	**$ 30,865,750.00**
				SUBTOTAL	**$ 30,982,000.00**
MISCELLANEOUS					
1	Erosion Control and Dewatering (20% Subtotal)	1	LS	$ 6,196,000.00	$ 6,196,000.00
2	Geotechnical and Survey (5% Subtotal)	1	LS	$ 1,549,000.00	$ 1,549,000.00
3	Maintenance of Traffic (5% Subtotal)	1	LS	$ 1,549,000.00	$ 1,549,000.00
4	Demolition and Site Preparation (10% Subtotal)	1	LS	$ 3,098,000.00	$ 3,098,000.00
5	Mobilization and Demobilization (10% Subtotal)	1	LS	$ 3,098,000.00	$ 3,098,000.00
6	Headwalls and Mitered Ends for Pipes (2% Subtotal)	1	LS	$ 620,000.00	$ 620,000.00
				SUBTOTAL WITH MISCELLANEOUS	**$ 47,092,000.00**
				20% CONTINGENCY	**$ 9,418,400.00**
				TOTAL CONSTRUCTION COST	**$ 56,510,000.00**

Disclaimer: The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

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ENGINEER'S OPINION OF PROBABLE COST Assessment Area E - Selected Long Range Alternatives January 2024								
ITEM	**DESCRIPTION**	**ESTIMATED QUANTITY**		**UNIT PRICE**		**AMOUNT**		
EARTHWORK-CLEAR-GRUB-GRADE								
1	Reconstruction of Disturbed Area (Non-Road)	1200	SY	$	12.00	$	14,400.00	
2	Reconstruction of Disturbed Area (Paved Road)	500	SY	$	45.00	$	22,500.00	
3	Roads Raised	1190	LF	$	150.00	$	178,500.00	
4	Residential Seawalls Added	9350	LF	$	2,000.00	$	18,700,000.00	
					TOTAL	**$**	**18,915,400.00**	
STORM WATER								
5	Plugging/Disconnecting Pipe	780	LF	$	500.00	$	390,000.00	
6	Pipe to be Placed	2630	LF	$	210.00	$	552,300.00	
7	Structures (Inlets/Manholes)	15	EA	$	9,000.00	$	135,000.00	
8	Pump Station (E1 - 30 cfs)	1	EA	$	3,080,000.00	$	3,080,000.00	
9	Pump Station (E2 - 100 cfs)	1	EA	$	7,680,000.00	$	7,680,000.00	
10	Pump Station (E3 - 20 cfs) - 3 Phase Power Unavailable	1	EA	$	3,480,000.00	$	3,480,000.00	
11	Pump Station (E4 - 20 cfs)	1	EA	$	3,080,000.00	$	3,080,000.00	
12	Pump Station (E5 - 25 cfs)	1	EA	$	3,080,000.00	$	3,080,000.00	
13	Pump Station (E6 - 10 cfs)	1	EA	$	3,080,000.00	$	3,080,000.00	
14	Pump Station (E7 - 10 cfs)	1	EA	$	3,080,000.00	$	3,080,000.00	
					TOTAL	**$**	**27,637,300.00**	
					SUBTOTAL	**$**	**46,553,000.00**	
MISCELLANEOUS								
1	Erosion Control and Dewatering (20% Subtotal)	1	LS	$	9,311,000.00	$	9,311,000.00	
2	Geotechnical and Survey (5% Subtotal)	1	LS	$	2,328,000.00	$	2,328,000.00	
3	Maintenance of Traffic (5% Subtotal)	1	LS	$	2,328,000.00	$	2,328,000.00	
4	Demolition and Site Preparation (10% Subtotal)	1	LS	$	4,655,000.00	$	4,655,000.00	
5	Mobilization and Demobilization (10% Subtotal)	1	LS	$	4,655,000.00	$	4,655,000.00	
6	Headwalls and Mitered Ends for Pipes (2% Subtotal)	1	LS	$	931,000.00	$	931,000.00	
					SUBTOTAL WITH MISCELLANEOUS	**$**	**70,761,000.00**	
					20% CONTINGENCY	**$**	**14,152,200.00**	
					TOTAL CONSTRUCTION COST	**$**	**84,913,000.00**	

Disclaimer: The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Decision Support Matrix

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Decision Support Matrix: Assessment Area A

Alternative	LOS Criteria	Scale of Project Costs	Flexibility to Phase Projects	Water Quality Benefits	Operation and Maintenance Considerations	Future Conditions Considerations
Alternative 1A: Upsizing infrastructure without pump station, pump stations added in future conditions	Substantial modeled flood reduction in asssessment area. Modeled flooding remains in low lying areas where stages are equalized with lakes.	Thousands of linear ft of piping required for project. Work within easements or new easements required for some proposed pipes	Can phase projects out as individual improvements both upstream and downstream of existing lakes. Pump stations can be added long-term	None	Continue current operation and maintenance, reevaluate operation of lake control structures as	Additional Pumps will needed to be added along Crayron Road and at Lakes
Alternative 2A: Master pump station, additional pump stations added in future conditions	Substantial modeled flood reduction in asssessment area. Modeled flooding remains in low lying areas where stages are equalized with lakes.	Thousands of linear ft of piping required for project. Work within easements or new easements required for some proposed pipes. Significant additonal infrastructure changes associated with pump station	Limited flexibility, phasing should prioritize master pump station and upstream infrastructure	Pumps can house diversion tanks to provide some water quality benefit, but less water will be treated by existing ponds	New pumps will need continuous maintenance	Additional Pumps will needed to be added along Crayron Road and at Lakes
No improvements	Current flooding problems persist. Areas failing to meet LOS goals will continue to do so. In future LOS issues will expand	No Cost	N/A	None	Continue current operation and maintenance	Flooding will worsen in Future Conditions

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Decision Support Matrix: Assessment Area B

Alternative	LOS Criteria	Scale of Project Costs	Flexibility to Phase Projects	Water Quality Benefits	Operation and Maintenance Considerations	Future Conditions Considerations
Alternative 2B: Proposed pump stations with new infrastructure and altered connections	Almost complete modeled flood reduction in assessment area. Remaining modeled flooding in areas connected to offsite area at 5th Ave S (US-41)	Thousands of linear ft of piping required for project. Pump stations are proposed. Some coordinaton with private landowners needed.	Infrastructure closest to outfall should be prioritied, then projects upstream of outfalls can be phased accordingly. Individual pumps can be phased and prioritized as needed	Pumps will house diversion tanks to provide some water quality benefit	New pumps will need continuous maintenance	Some additional pumps and associated improvements may need to be added, seawalls are proposed
Alternative 3B: New infrastructure and altered connections, no pumps	Substantial modeled flood reduction in assessment area. Flooding remains on sections of 8th Ave S and a small section of 9th St S.	Thousands of linear ft of piping required for project. Extensive coordinaton with private landowners needed due to additional gravity improvements.	Infrastructure closest to outfall should be prioritied, then projects upstream of outfalls can be phased accordingly. Individual pumps can be phased and prioritized as needed	None	Continue current maintenance	Several additional pumps and associated improvements may needed to be added, seawalls are proposed
No Improvements	Current flooding problems persist. Areas failing to meet LOS will continue to do so. In future LOS issues will expand	No Cost	N/A	None	Continue current maintenance	Flooding will worsen in Future Conditions

Decision Support Matrix: Assessment Area C

Alternative	LOS Criteria	Scale of Project Costs	Flexibility to Phase Projects	Water Quality Benefits	Operation and Maintenance Considerations	Future Conditions Considerations
Alternative 2C: Pump stations serve entire area, disconnect from existing pump stations	Almost complete modeled flood reduction within assessment area	Thousands of linear ft of piping required for project. Easements required for proposed several pipes and pump stations.	Pumps be phased and prioritized as needed. Infrastructure closest to outfall should be prioritied, then projects upstream of outfalls can be phased accordingly.	Pumps will house diversion tanks to provide some water quality benefit	New pumps will need continuous maintenance	An additional pump station and seawalls are proposed.
Alternative 3C: Mix of pumps and increased gravity outfalls, disconnect from existing pump stations	Considerable flood reduction throughout assessment area. Remaining flooding located at low-loying intersections or commercial areas where it is not feasible to upsize infrastructure.	Thousands of linear ft of piping required for project. Easements required for proposed several pipes and pump stations.	Pump projects should be prioritized before gravity improvements.	Pumps will house diversion tanks to provide some water quality benefit. Large amounts of untreated stormwater will remain	New pumps will need continuous maintenance	Additional pump stations and swawalls are proposed.
No Improvements	Current flooding problems persist. Areas failing to meet LOS will continue to do so. In future LOS issues will expand	No Cost	N/A	None	Continue current maintenance	Flooding will worsen in Future Conditions

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Decision Support Matrix: Assessment Area D						
Alternative	LOS Criteria	Scale of Project Costs	Flexibility to Phase Projects	Water Quality Benefits	Operation and Maintenance Considerations	Future Conditions Considerations
Alternative 2D: Maximize connection to proposed pump station at Goodlette-Frank and upsized Public Works Pump	Substantial modeled flood reduction across assessment area. Modeled flood reduction is limited at Central Ave and 10th St N is limited due to offsite flows	Thousands of linear ft of piping required for project, upsied pump station and proposed pump station	Limited flexibility to phase projects as 5th Ave drainage will still be connected to Public Works Pump and FPL system	Pumps will house diversion tanks to provide some water quality benefit. Some untreated stormwater will remain until all areas are treated by pumps	New pumps will need continuous maintenance	Remaining gravity connections mat need to be plugge
Alternative 3D: Upsized gravity systems serving 5th Ave and Central Ave	Substantial modeled flood reduction across assessment area. Modeled flood reduction is limited at Central Ave and 10th St N is limited due to offsite flows	Thousands of linear ft of piping required for project and upsied pump station	Flexibility to phase projects as areas will be served by separate systems. Pumps can be installed to current gravity outfalls in future conditions as needed	None	Upsized Public Works Pump may need new maintenance	Proposed upsized gravity outfalls can be converted to pump stations with limited additional infrastructure improvements. Roads are proposed to be raised
No Improvements	Current flooding problems persist. Areas failing to meet LOS will continue to do so. In future LOS issues will expand	No Cost	N/A	None	Continue current maintenance	Flooding will worsen in Future Conditions

Decision Support Matrix: Assessment Area E

Alternative	LOS Criteria	Scale of Project Costs	Flexibility to Phase Projects	Water Quality Benefits	Operation and Maintenance Considerations	Future Conditions Considerations
Alternative 1E (Upsize pipes)	Widespread modeled flood reduction along roads within assessment area.	Pipe improvements limited to areas of existing infrastructure	Flexibility to phase projects based on which individual improvements are prioritized	Pumps will house diversion tanks to provide some water quality benefit	New pumps will need continuous maintenance	Additional pump stations and pipe improvements are proposed along with seawalls and road raising
Alternative 2E (Upsize pipes and add new gravity connections to pump station)	Widespread modeled flood reduction along roads within assessment area.	Thousands of linear ft of piping required for project and proposed pump station	Limited flexibility due to interconnected improvements	Pumps will house diversion tanks to provide some water quality benefit	New pumps will need continuous maintenance	Additional pump stations are proposed along with seawalls and road raising
No Improvements	Current flooding problems persist. Areas failing to meet LOS will continue to do so. In future LOS issues will expand	No Cost	N/A	None	Continue current maintenance	Flooding will worsen in Future Conditions

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APPENDIX A DATA COLLECTION

Data Collection Log

City of Naples Basin Assessments
Data Collection Log

Name	Description	Source	Date Downloaded or Received	Source Date
Naples Soil Data	Spatial and tabular data of the soils in the project area	NRCS	9/28/2021	9/16/2019
Hydrologic Soil Group	Hydrologic soil groups for the soils in the project area	NRCS	9/28/2021	9/16/2019
LULC	Land use and land cover for Naples	FDEP	9/21/2021	1/31/2017
Naples DEM	Four tiles from the 2018 Southwest FL LiDAR dataset were mosaiced. The original was in meters, but it was converted to ft for our use.	NOAA	6/30/2021	2018
ERP	Environmental Resource Permits for Naples	SFWMD	9/22/2021	12/13/2011
Future Land Use	Future land use for the City of Naples	City of Naples	10/15/2021	5/21/2016
Major Basins	Major basins for Naples	City of Naples	8/4/2021	-
Stormwater Infrastructure	Stormwater infrastructure for the subbasins in Naples	City of Naples	10/15/2021	-
Drainage Easement Memo	Memo from the City Clerk providing results of research into the existence of drainage easements in relation to lakes within the City.	City of Naples	12/2/2021	4/13/2010
Lake List	Lake List including information on subdivision, location, ownership, easement access, some owner contact info and any additional information	City of Naples	12/2/2021	-
Golf Course Lake Info	Provides info on the ownership and easements for the lake on the north side of the Naples Beach Club golf course	City of Naples	12/2/2021	2/14/2012
Request for Legal Opinion	Request for legal opinion from the natural resource manager to the city attorney to determine city's authority and rights for authorizing lake dredge and fill projects.	City of Naples	12/2/2021	2/14/2019
Harmful Algal Bloom Emails	Emails among City of Naples people about algal blooms in Spring Lake, Swan Lake and Moorings Bay between Jan 2019 an August 2019	City of Naples	12/2/2021	-
FDMPARK_R	Rainfall data downloaded from DBHydro. This data is in 15 minute increments. Collection began in November 2014 and goes through December 2021.	DBHydro	1/10/2022	-
FDMPARK_R	Rainfall data downloaded from DBHydro. This data is in daily increments. Collection began in November 2014 and goes through December 2021.	DBHydro	1/10/2022	-
COCO3_R	Rainfall data downloaded from DBHydro. This data is in 15 minute increments. Collection began in October 2007 and goes through December 2021.	DBHydro	1/10/2022	-
COCO3_R	Rainfall data downloaded from DBHydro. This data is in daily increments. Collection began in October 2007 and goes through December 2021.	DBHydro	1/10/2022	-
GOLDFS2	Rainfall data downloaded from DBHydro. This data is in 15 minute increments. Collection began in October 2007 and goes through December 2021.	DBHydro	1/10/2022	-
GOLDFS2	Rainfall data downloaded from DBHydro. This data is in daily increments. Collection began in October 2007 and goes through December 2021.	DBHydro	1/10/2022	-
D28_R	Rainfall data downloaded from DBHydro. This data is in daily increments. Collection began in April 2017 and goes through December 2021.	DBHydro	1/10/2022	-
GG3_R	Rainfall data downloaded from DBHydro. This data is in 15 minute increments. Collection began in March 2016 and goes through December 2021.	DBHydro	1/10/2022	-
GG3_R	Rainfall data downloaded from DBHydro. This data is in 15 minute increments. Collection began in May 12 2015 and goes through January 10 2022.	DBHydro	1/10/2022	-
GG3_R	Rainfall data downloaded from DBHydro. This data is in daily increments. Collection began in March 2016 and goes through December 2021.	DBHydro	1/10/2022	-
GG3_R	Rainfall data downloaded from DBHydro. This data is in daily increments. Collection began in May 12 2015 and goes through January 9 2022.	DBHydro	1/10/2022	-
COLGOV_R	Rainfall data downloaded from DBHydro. This data is in 15 minute increments. Collection began in October 2007 and goes through December 2021.	DBHydro	1/10/2022	-
COLGOV_R	Rainfall data downloaded from DBHydro. This data is in daily increments. Collection began in October 2007 and goes through December 2021.	DBHydro	1/10/2022	-
COCO1_R	Rainfall data downloaded from DBHydro. This data is in 15 minute increments. Collection began in October 2007 and goes through December 2021.	DBHydro	1/10/2022	-

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City of Naples Basin Assessments
Data Collection Log

Name	Description	Source	Date Downloaded or Received	Source Date
COCO1_R	Rainfall data downloaded from DBHydro. This data is in daily increments. Collection began in October 2007 and goes through December 2021.	DBHydro	1/10/2022	-
FDOT IDF Curves	FDOT Drainage Manual IDF Curves and rainfall distribution curves. Naples is in Zone 8	FDOT	1/10/2022	-
SFWMD Rainfall Amount and Distribution	SFWMD Rainfall Amount and Distribution from the ERP Applicant's Handbook Volume II	SFWMD	1/10/2022	5/22/2016
Sarasota County Level of Service	Sarasota County Level of Service information	Sarasota County	1/11/2021	-
Lake Dredge and Fill Petitions	Resolutions issued to private owners allowing them to dredge, fill, add rip-rap, etc. to lakes within the City of Naples	City of Naples	1/10/2022	4/17/2013 - 6/5/2019
Lake Management Plan Appendix A	Memo provides supplemental information on a proposed stormwater Lake Management Plan including presentation made to city council	City of Naples	1/10/2022	3/12/2012
Water Quality Trend Plots	Plots include chlorophyll A, copper, DO SAT, enterococci, fecal coliform, total N, total P, TSS	City of Naples	1/10/2022	5/28/2019
Resident Lake Survey	Survey created for the City of Naples Lake Management Plan to collect info from residents about the stormwater lakes bordering/adjacent to their homes.	City of Naples	1/10/2022	-
Resident Lake Survey Responses	Lake Management Survey Plan survey responses	City of Naples	1/10/2022	-
Stormwater Lakes Management Plan Update	Updated stormwater lakes management plan including review of previous management plans, assessment of available data, and identification of data gaps. Update performed by Wood Engineering	City of Naples	1/10/2022	9/6/2019
City of Naples contract with Wood	Legal contract and scope of services with Wood Engineering	City of Naples	1/10/2022	3/15/2019
Basin 4 Stormwater Analysis	Stormwater analysis on Basin 4 to evaluate the current level of service and develop proposed projects to achieve the desired level of service. Performed by AECOM	City of Naples	1/10/2022	10/30/2020
CDM Drainage Report	Basin 3 drainage report, proposed alternatives, and cost estimate. The scope of this project included H&H modeling, conceptual alternatives, pump station design, permitting, and services during construction	City of Naples	1/10/2022	2/1/2001
Basin 3 calculations and rainfall	2yr-24hr, 5yr-24hr, and 25-yr 72hr rainfall data, Alt Ultimate model files, and Phase 2 calculations.	City of Naples	1/10/2022	-
Basin 3 Model Review	Draft letter report of City-Modified Improvements for the Basin 3 model. Reviewed by Mike Gregory. Excel sheet of model results	City of Naples	1/10/2022	5/9/2002
Basin 3 Model	Basin 3 Model created by CDM in 2001.	City of Naples	1/10/2022	2001
Basin 3 Drawings	Basin 3 Drainage Improvement Master Plan CAD Files	City of Naples	1/10/2022	5/25/2003
Collier County Parcels	Parcel polygons with parcel ID and some other fields	Collier County	1/24/2022	1/21/2022
Collier County Parcel Info	CSV files downloaded from collier county website, specifically the parcel information.	Collier County	1/24/2022	-
Collier County Stormwater Infrastructure	Storm outlet, inlet, manhole, and pipe locations that Collier County had within the assessment areas.	Collier County	3/10/2022	-
Basin Maps - Flooding & Other	Aerial map of the assessment areas with known flooding areas noted.	City of Naples	3/1/2022	8/26/2020
Building Footprints	Polygons of the building footprints from the Collier County Property Appraiser	Collier County	2/16/2022	-
Finished Floor Elevations	Building certificates with finished flood elevations for the 2000 structures within the project area in Naples	City of Naples Floodplain Coordinator	2/17/2022	2021
Station #92 Cove Stormwater Pump	All the data provided by the City of Naples on Station #92 Cove Stormwater Pump. This includes engineering plans, operating schedule, photos and more.	City of Naples	4/11/2022	-
Tax Assessment	Special tax assessment area information requested by ICF.	City of Naples	4/27/2022	11/2021 and 03/2022

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City of Naples Basin Assessments
Data Collection Log

Name	Description	Source	Date Downloaded or Received	Source Date
FDOT District One - Map B5 Federal Functional Classification/Urban Boundaries - Collier County - Inset 4	FDOT road classification for City of Naples	FDOT	12/9/2022	2010
Swan Lake Survey	Bathymetric survey of Swan Lake	City of Naples	2/10/2023	3/18/2022
Devil's Lake survey	Plot plan of home at 4646 Crayton Rd. This includes data on the structure leaving Devil's Lake	City of Naples	2/10/2023	2/18/2021
Swan Lake Outfall 2022 Hydrograph	Plot of Swan Lake outfall water elevation from data logger	City of Naples	2/15/2023	2022
Swan Lake Outfall 2022 Hydrograph	Raw data and some figures in the sheets.	City of Naples	2/15/2023	2022
Survey Data	Lidar .tiff files of the road surfaces throughout the survey areas and excel files containing drainage structure information.	WGI, Inc.	9/13/2022 - 2/27/2023	-

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Public Meeting Notes

MEETING NOTES
Public Meeting for Study Area A
City of Naples Multi-Basin Stormwater Assessments
February 7, 2023, 4:00 PM
River Park Community Center

Attendees

- City of Naples: Eddie Bliss, Samantha McEnhill, and Bob Middleton
- Kimley-Horn: Kellie Clark and Alyssa Ford
- Members of the Public (sign in sheet attached)

During this meeting, Kimley-Horn presented the information in the attached PowerPoint. This provided an overview of the project, the existing results for Study Area A, and potential improvements. There was then time for the public to ask questions and provide feedback on the model results so far. The resulting map and comments are also attached.

PUBLIC MEETING RESIDENT LIST FOR AREA A

Name	Phone #	Email	Address
William Levin	312-363-9686	Wlean2004@gmail.com	4774 West Blvd 34103
David Brush	317-514-9486	dabrush@gmail.com	720 Anderson Dr 34103
Haux	845-649-7671		832 Myrtle Terrace
Derek Steecgerc	312-888-6215	Derek.steelberg@gmail.com	533 Turtle Hatch Ln 34103
Mark Borell	239-269-5690	mvborellie@aol.com	545 whispery pine court
Jim Laughlin	312-835-6600	James.A.laughlin@gmail.com	4861 W. Blvd. CT
Angelina Turra	239-404-3445	oldnaples@aol.com	
Chuck Wooster	614-560-3689	Cwooster@aol.com	527 Devils Lane
Christine & Dennis Raber	239-571-1726 & 239-253-0936	Christiner@american-farms.com Dmccarthy1019@gmail.com	531 Neapolitan Lane
Doug Nelson	239-398-2939	Nelsondoug@comcast.net	581 Whispering Pine Ln


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Expect More. Experience Better.
City of Naples
Basin Assessments
Public Meeting

Project Overview

- Five areas of interest across the City of Naples are being studied with the goal to reduce the impacts of flooding during storm events (Assessment Areas A-E)
- The five areas chosen were identified as vulnerable to flooding or water quality issues
- Project kicked off on September 22, 2021

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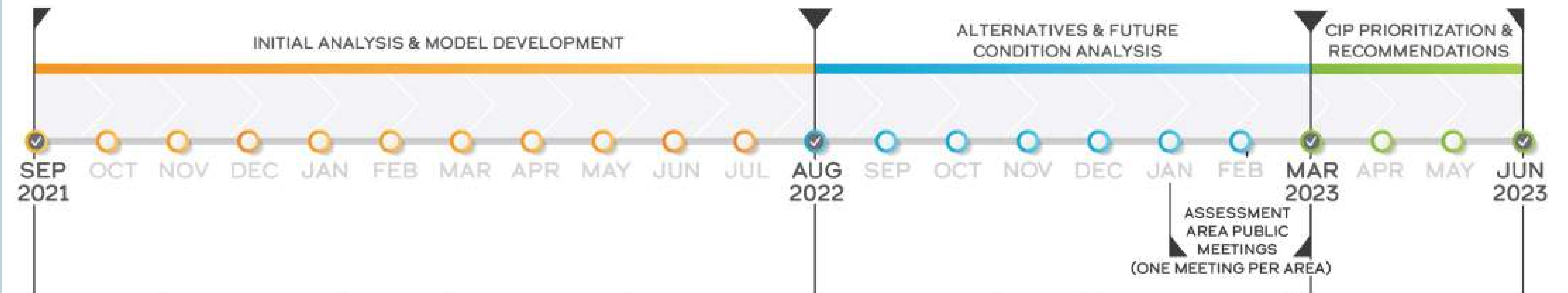
Project Schedule



Developing a stormwater model that will simulate the impacts of rainfall and sea level rise and help determine the extents of flooding

Confirming locations of flooding to determine stormwater infrastructure improvements

Creating a proposed conditions model that simulates the effects of proposed improvements (improvements could include adding new infrastructure or replacing current

Simulating a future conditions scenario to determine how resilient the proposed improvements are taking into account future conditions such as sea level rise

Completing a cost benefit analysis to support recommended improvements to incorporate short term, medium term, and long term (CIP prioritization)

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Project Goals

1. Developing a stormwater model that will simulate the impacts of rainfall and sea level rise and help determine the extents of flooding
2. Protection of and improvement to the City's surface and ground water resources
3. Protection of public and private property
4. Protection and restoration of ecology
5. Planning for wise and strategic stormwater management system investments
6. Planning for sustainability and resiliency relating to anticipated climate change

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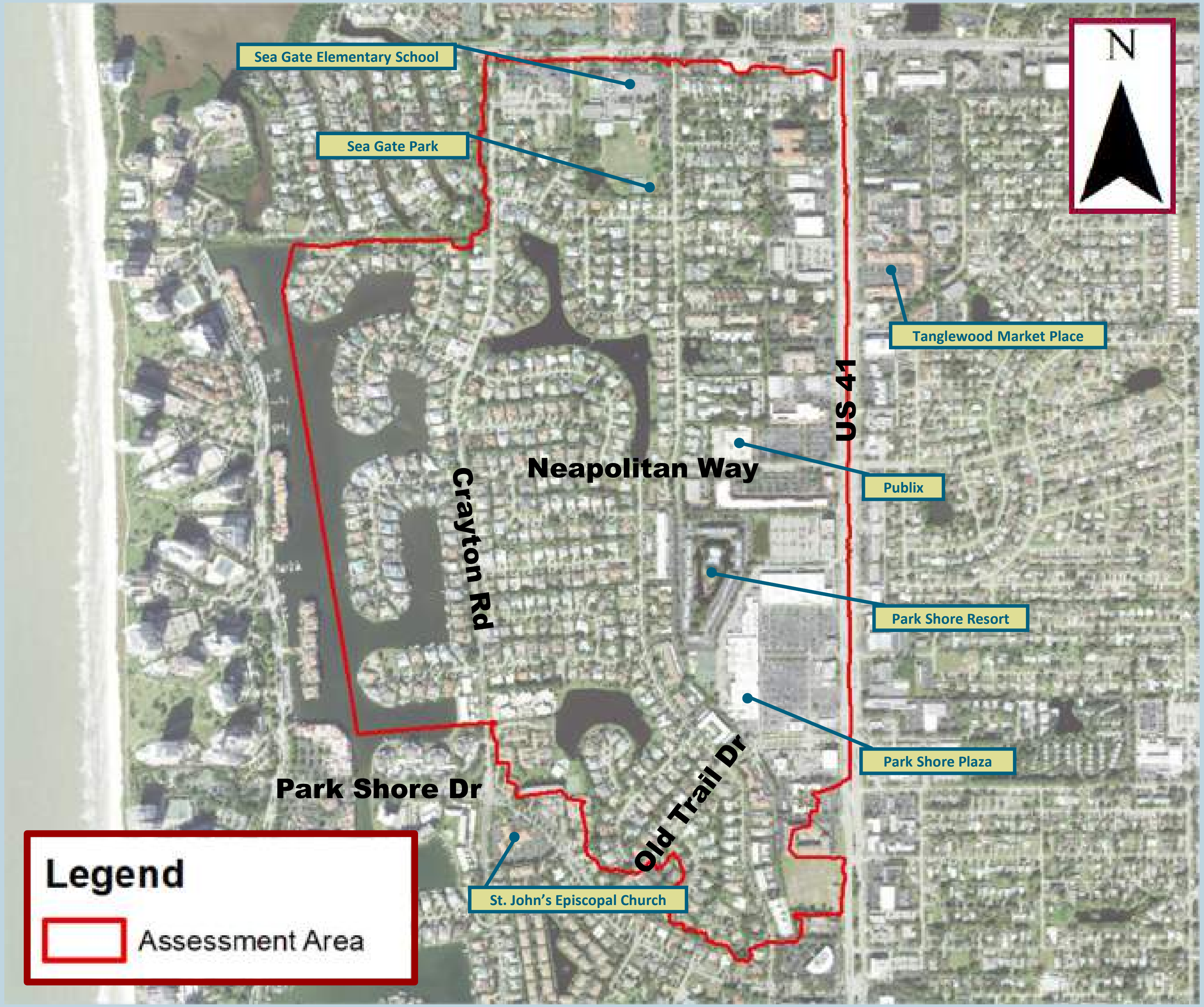
Assessment Area A



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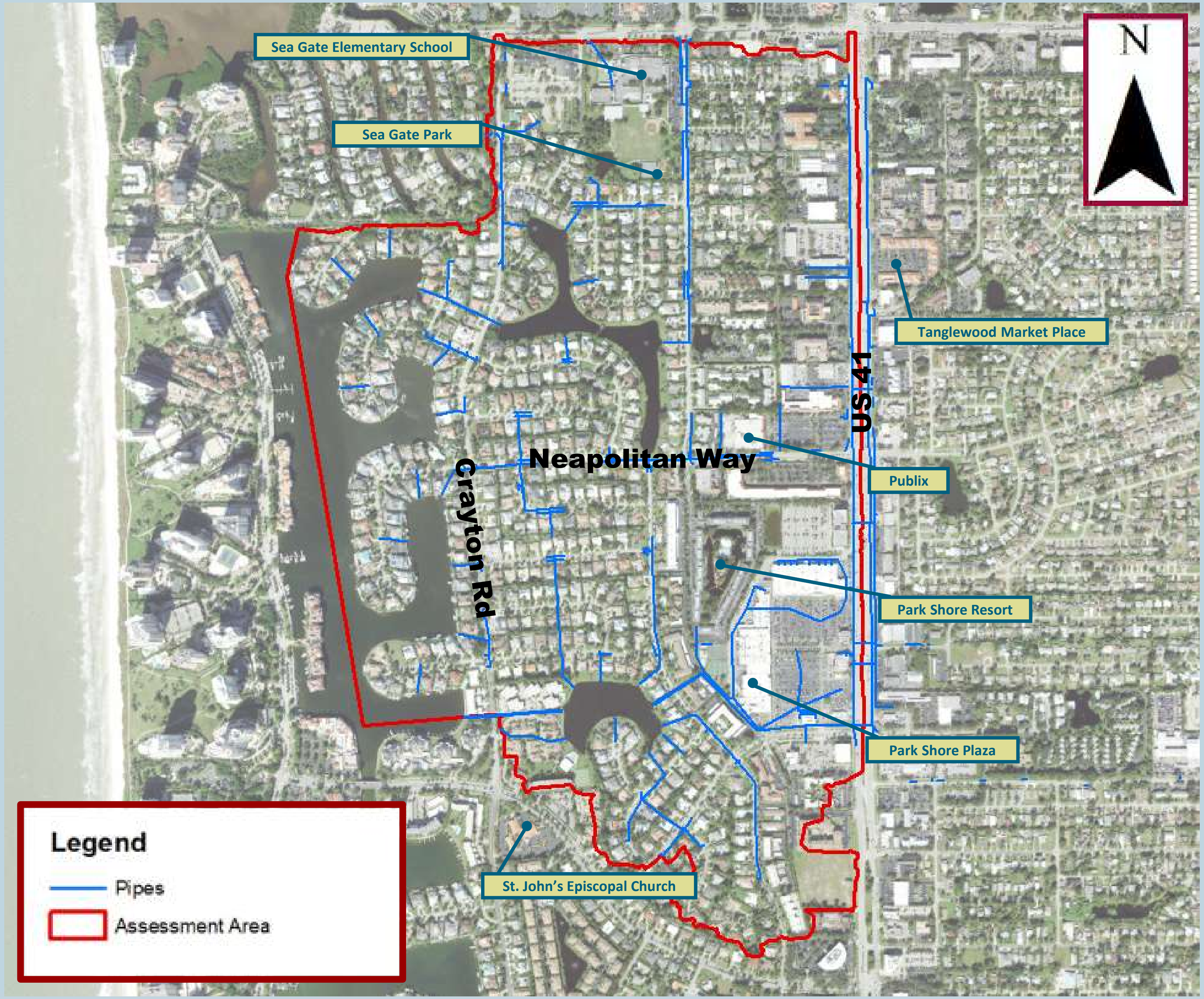
Data Collection



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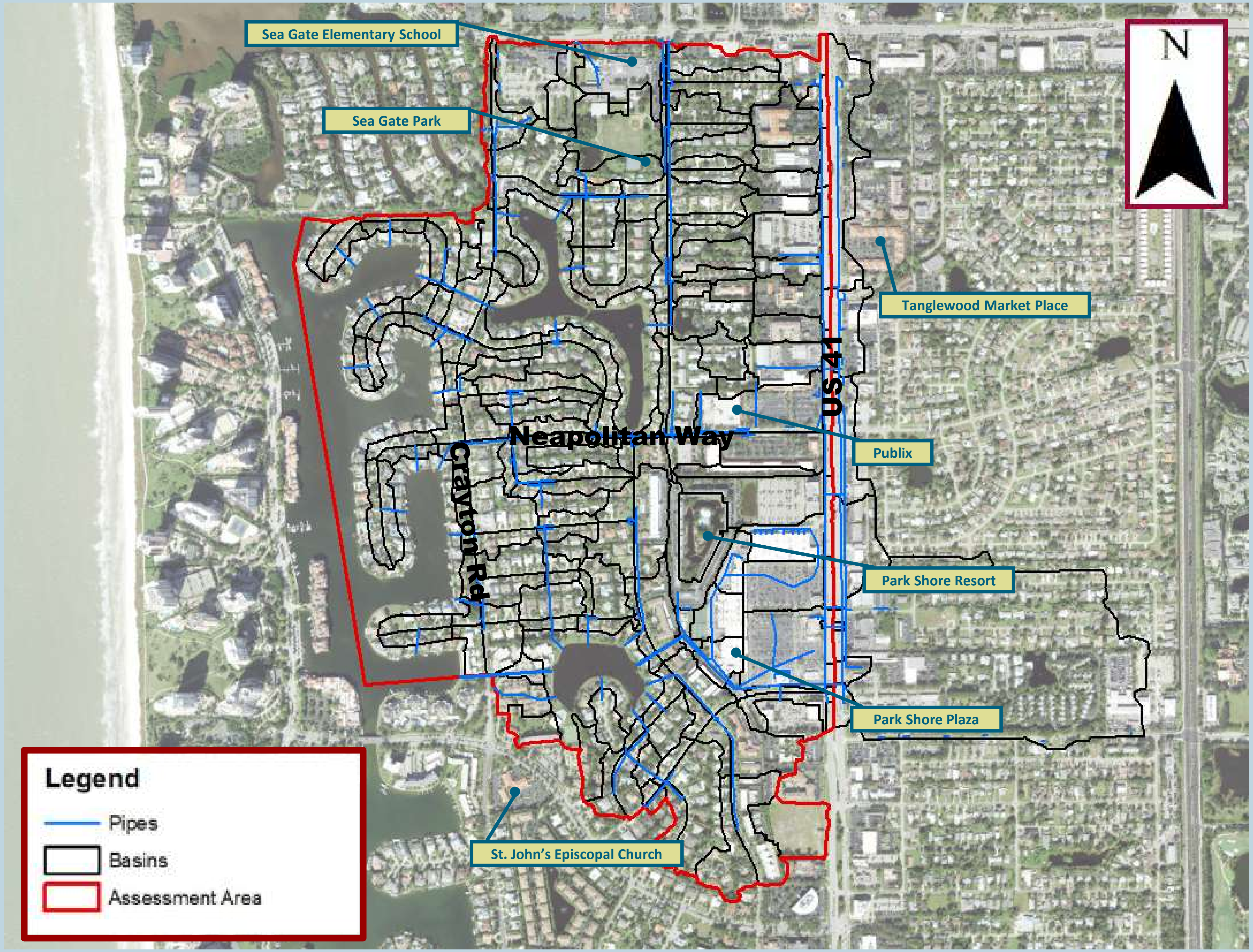
Model Development



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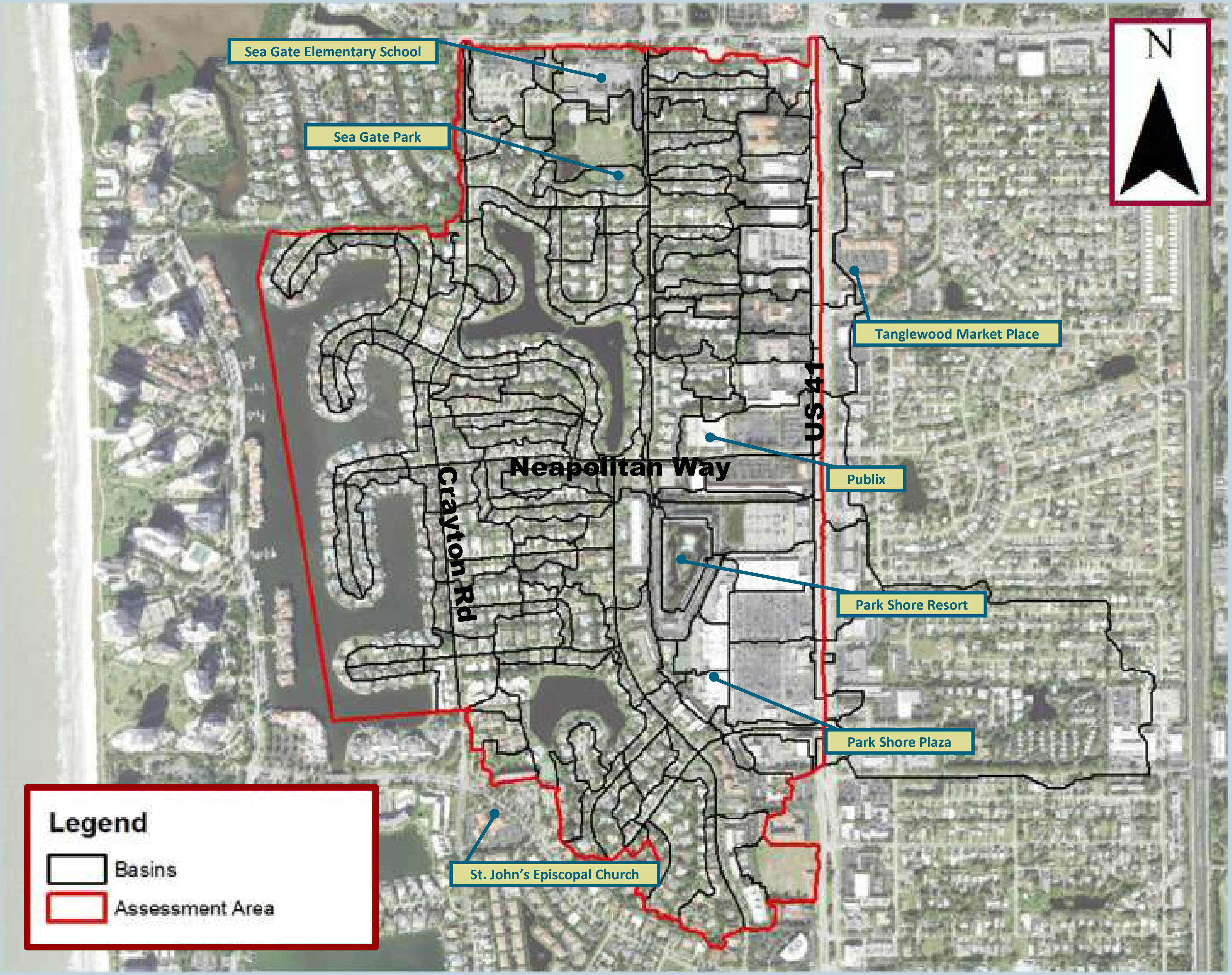
Model Development



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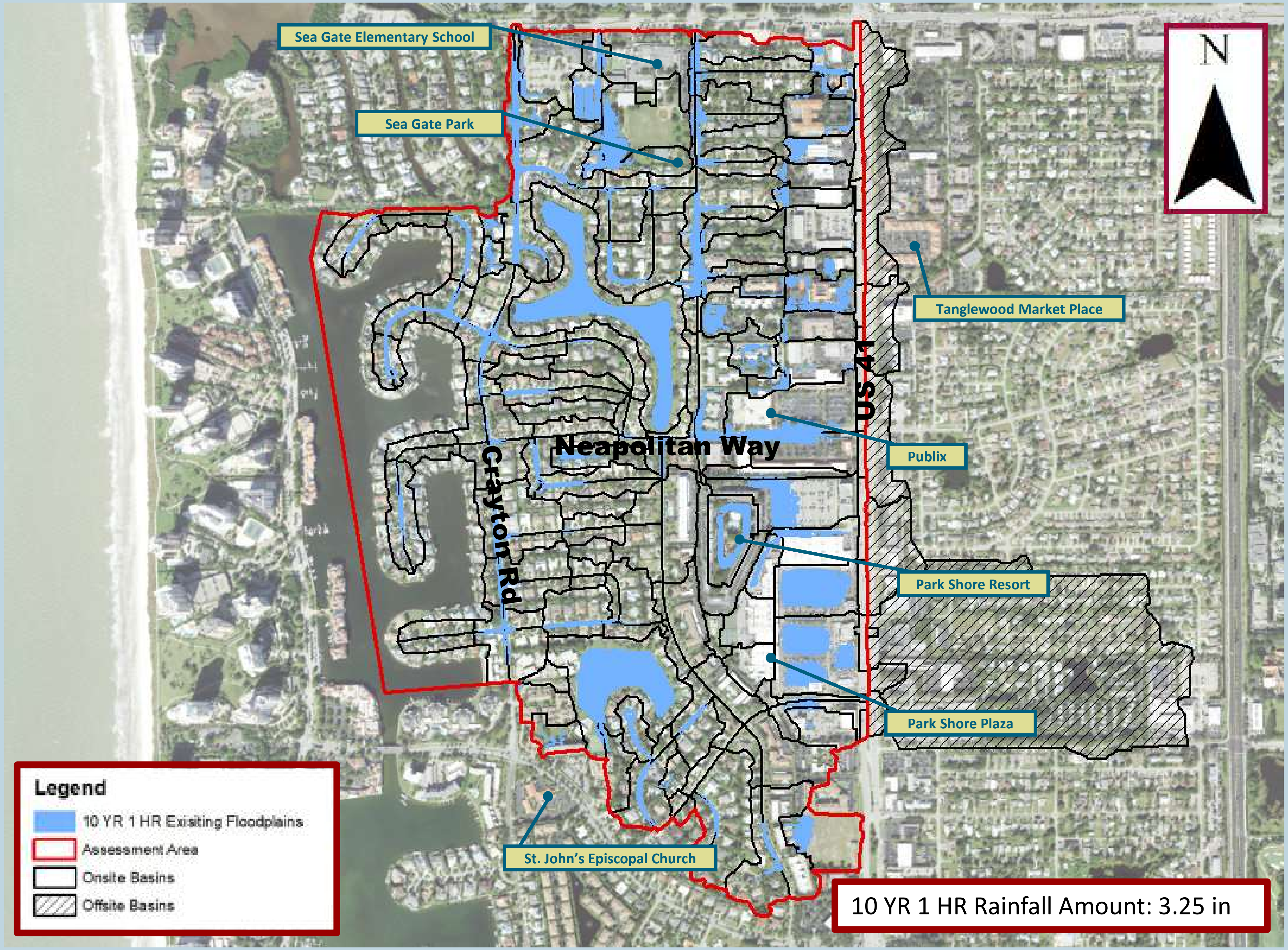
Model Results



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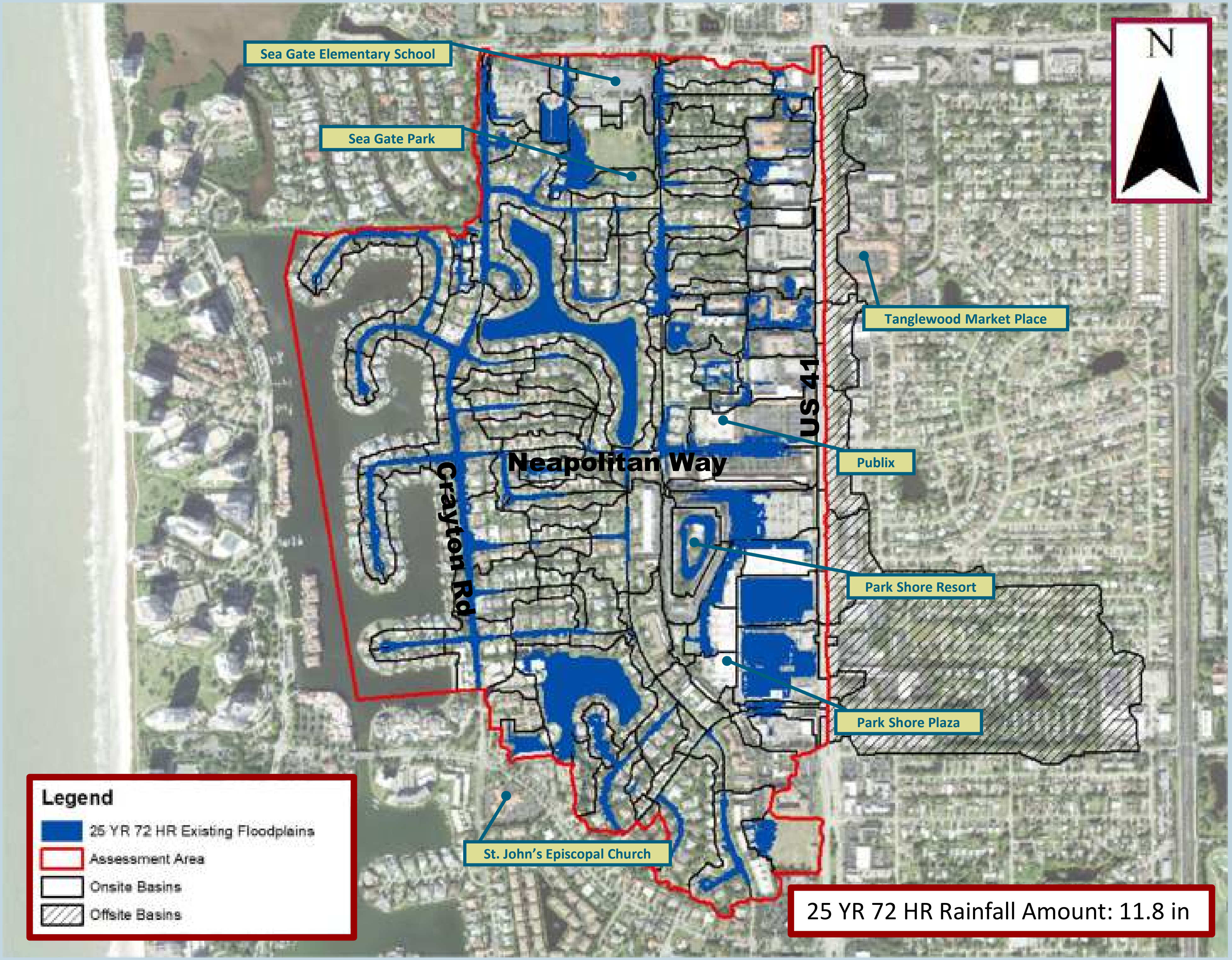
Model Results



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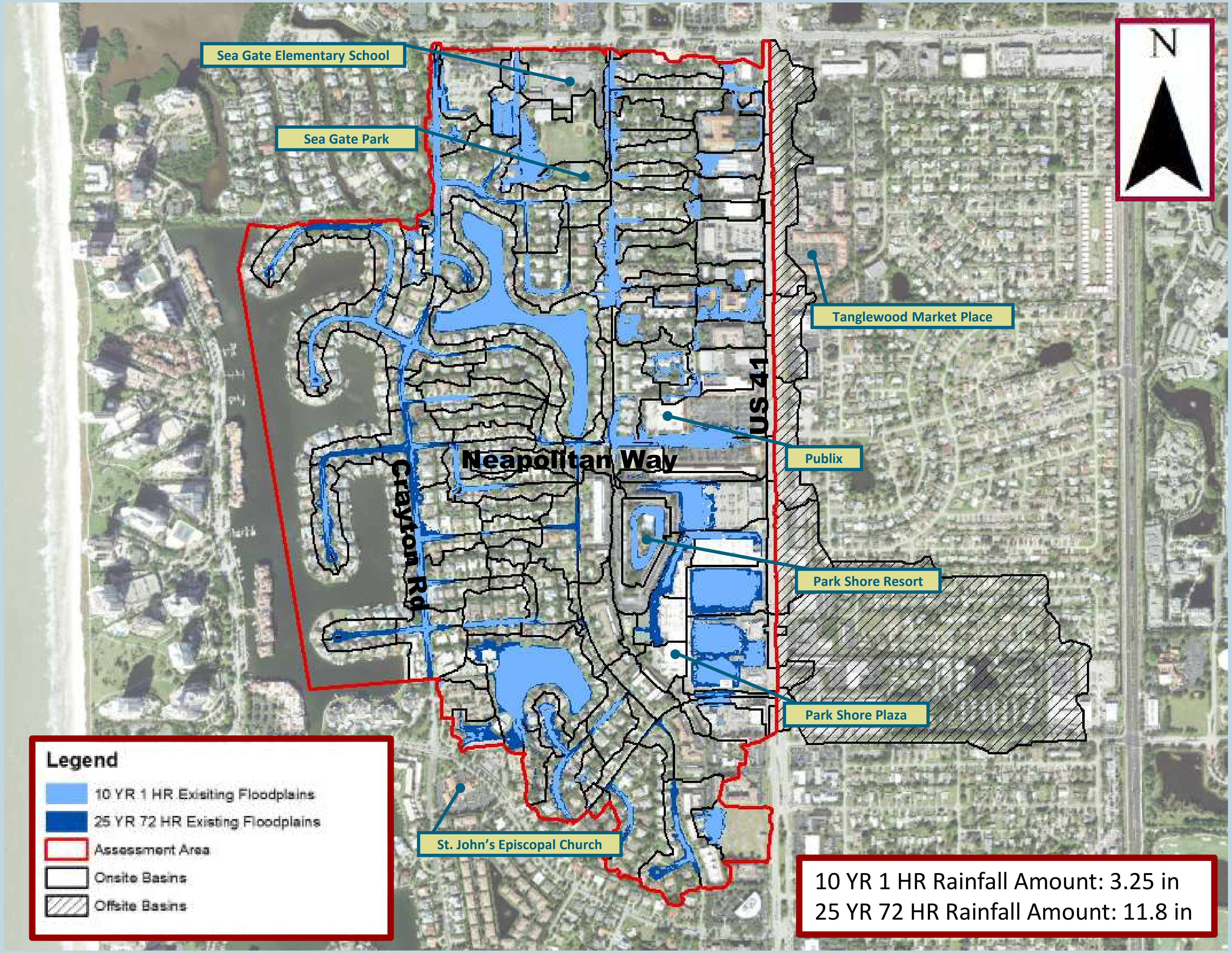
Model Results



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Potential Improvements

Short-term strategies
- Increase pipe sizes
- Add additional pipe runs
- Rerouting pipe networks
- Increase existing pump capacity
- Add new pumps
- Add check valves

Long-term strategies
- All the above strategies
- Raise roads
- Add or raise seawalls

Kimley»Horn

We Welcome Input

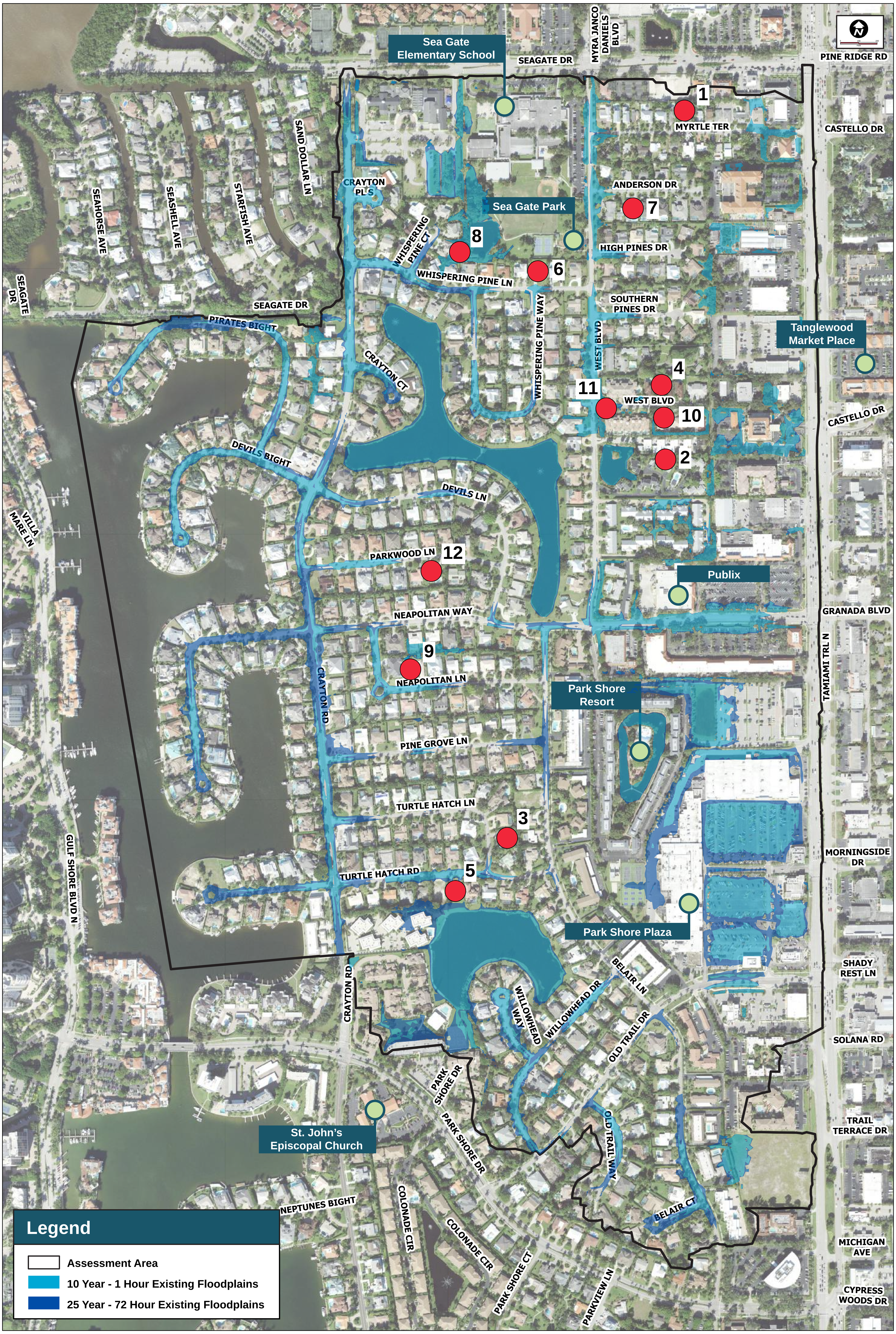
- Feedback on floodplains
- Questions on potential improvement strategies

Kimley»Horn

Please visit us at the booths to provide your input and feedback.

Thank you!

Kimley»Horn



Multi-Basin Stormwater Assessments

Assessment Area A

Kimley»Horn
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PUBLIC COMMENTS COLLECTED DURING PUBLIC MEETING

The comment numbers below correspond with the numbers called out in the attached exhibit.

COMMENT #	COMMENT
1	Road and driveway flooding has been experienced along Myrtle Terrace. There are no stormwater inlets or swales, so every time it rains there is ponding. Another resident said they have not seen any flooding along Myrtle Terrace.
2	There is no flooding at this location.
3	During Hurricane Ian, Swan Lake experienced higher staging than normal. Two feet of flooding occurred in garage structure.
4	There is no flooding at this location during normal rainfall events, and no flooding was experienced during Hurricane Ian.
5	No flooding was observed during normal rainfall events, but during the storm on August 25, 2017 there was some flooding.
6	Improvements were made to Sea Gate Park. Since then, no flooding behind this home has been noted, while backyard flooding was common prior to those improvements. Flooding in the roadway has been seen.
7	There is no road or structure flooding at this location, but the swale does fill with water during a storm.
8	Flooding in the pond has caused inundation in yards.
9	This location experiences standing water in the side yard (0.3') and in the road (0.4') with slime build up along the curb, gutters, and cracks in the pavement. It was discussed this is likely due to the water table elevation during the rainy season.
10	No flooding was observed at this location.
11	This location experiences flooding regularly.
12	This location experiences roadway flooding regularly. Additionally, debris has been reported which prevents the functioning of the drainage systems.

After the meeting, the public's comments were loaded into the public coordination website.

MEETING NOTES
Public Meeting for Study Area B
City of Naples Multi-Basin Stormwater Assessments
February 9, 2023, 3:00 PM
River Park Community Center

Attendees

- City of Naples: Eddie Bliss, Samantha McEnhill, and Bob Middleton
- Kimley-Horn: Kellie Clark and Alyssa Ford
- Members of the Public (sign in sheet attached)

During this meeting, Kimley-Horn presented the information in the attached PowerPoint. This provided an overview of the project, the existing results for Study Area B, and potential improvements. There was then time for the public to ask questions and provide feedback on the model results so far. The resulting map and comments are also attached.

PUBLIC MEETING RESIDENT LIST FOR AREA B

Name	Phone #	Email	Address
Mike Fauzeto	239-404-0230	M.faucett@comcast.net	1001 10th Ave S #215
Val Prince	239-860-8500	Val.prince4@gmail.com	878 5th Ave S
Joel A		arsengoel@aol.com	900 8th Ave South

Kimley»Horn

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City of Naples Basin Assessments

Public Meeting

Project Overview

- Five areas of interest across the City of Naples are being studied with the goal to reduce the impacts of flooding during storm events (Assessment Areas A-E)
- The five areas chosen were identified as vulnerable to flooding or water quality issues
- Project kicked off on September 22, 2021

Kimley»Horn

Project Schedule

Developing a stormwater model that will simulate the impacts of rainfall and sea level rise and help determine the extents of flooding

Confirming locations of flooding to determine stormwater infrastructure improvements

Creating a proposed conditions model that simulates the effects of proposed improvements (improvements could include adding new infrastructure or replacing current

Simulating a future conditions scenario to determine how resilient the proposed improvements are taking into account future conditions such as sea level rise

Completing a cost benefit analysis to support recommended improvements to incorporate short term, medium term, and long term (CIP prioritization)

Kimley»Horn

Project Goals

1. Developing a stormwater model that will simulate the impacts of rainfall and sea level rise and help determine the extents of flooding
2. Protection of and improvement to the City's surface and ground water resources
3. Protection of public and private property
4. Protection and restoration of ecology
5. Planning for wise and strategic stormwater management system investments
6. Planning for sustainability and resiliency relating to anticipated climate change

Kimley»Horn

Assessment Area B

Kimley»Horn

Data Collection

Kimley»Horn

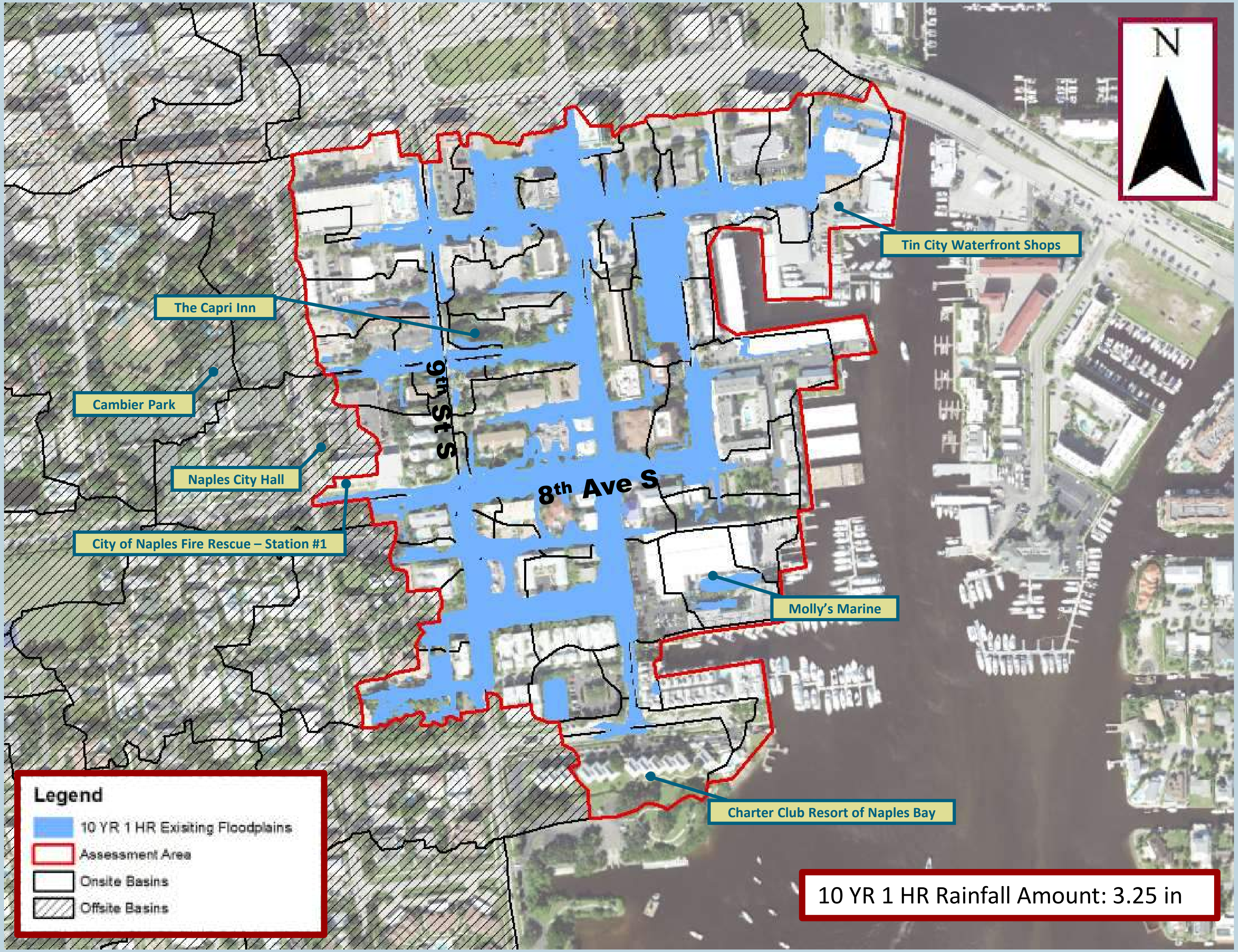
Model Development

Kimley»Horn

Model Development

Kimley»Horn

Model Results

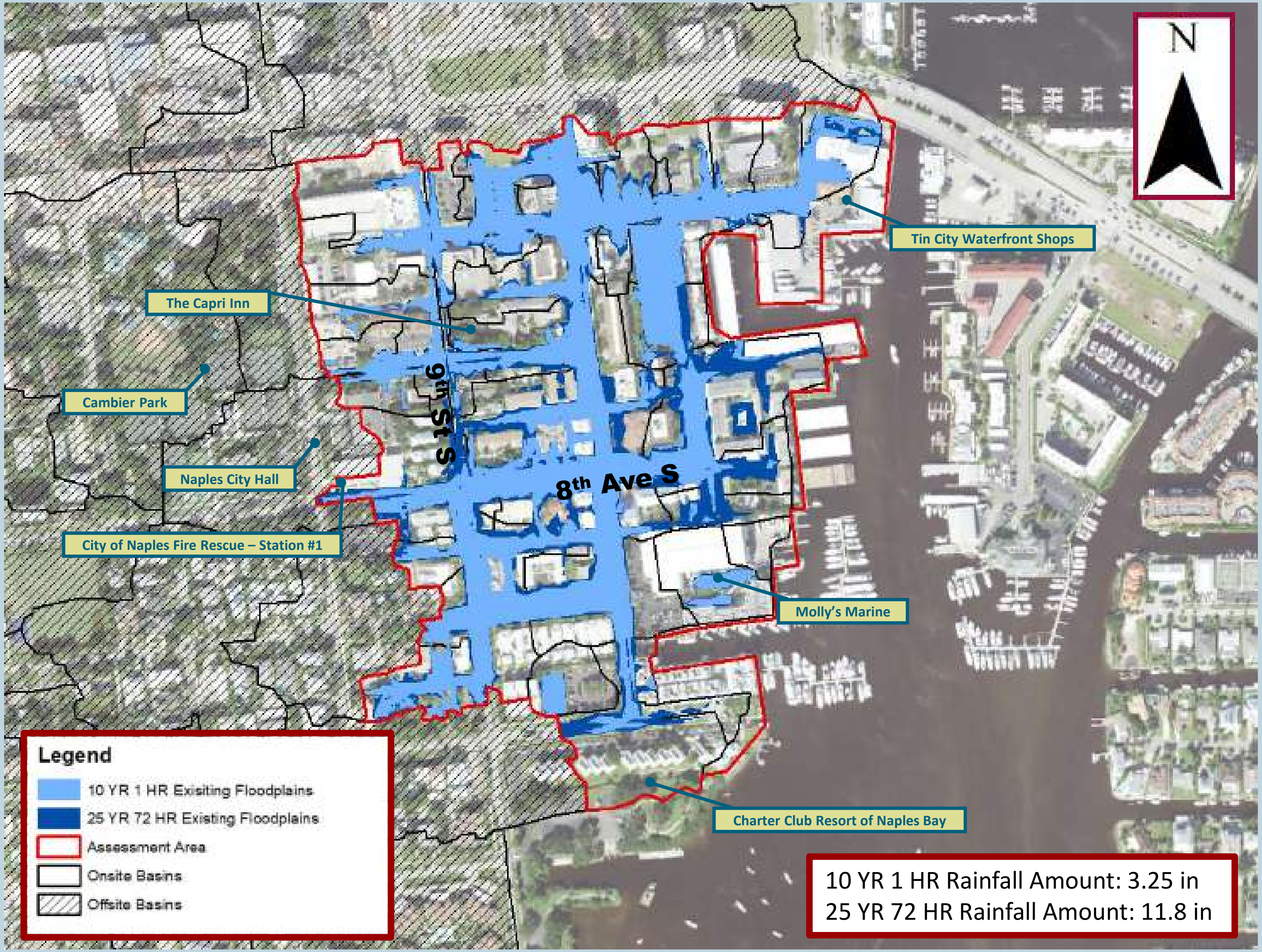


Kimley»Horn

Model Results

Kimley»Horn

Model Results



10 YR 1 HR Rainfall Amount: 3.25 in
25 YR 72 HR Rainfall Amount: 11.8 in

Kimley»Horn

Potential Improvements

Short-term strategies
- Increase pipe sizes
- Add additional pipe runs
- Rerouting pipe networks
- Increase existing pump capacity
- Add new pumps
- Add check valves

Long-term strategies
- All the above strategies
- Raise roads
- Add or raise seawalls

Kimley»Horn

We Welcome Input

- Feedback on floodplains
- Questions on potential improvement strategies

Kimley»Horn

Please visit us at the booths to provide your input and feedback.

Thank you!

Kimley»Horn

Multi-Basin Stormwater Assessments

Assessment Area B

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PUBLIC COMMENTS COLLECTED DURING PUBLIC MEETING

The comment numbers below correspond with the numbers called out in the attached exhibit.

COMMENT #	COMMENT
1	Flooding has been experienced in the alleyway during large storms ranging from 1" to 12".
2	As debris builds up in the drainage system, it causes flooding. This flooding clears quickly once the debris is removed. There has been flooding up to the garage from rainfall events during king tide.
3	The drainage system at this location seems to get backed up during storm events with no visible debris. Flooding has been seen at this location regularly.
4	Flooding has not been observed at this location.

After the meeting, the public's comments were loaded into the public coordination website.

MEETING NOTES
Public Meeting for Study Area C
City of Naples Multi-Basin Stormwater Assessments
March 2, 2023, 3:00 PM
River Park Community Center

Attendees

- City of Naples: Eddie Bliss, Samantha McEnhill, and Bob Middleton
- Kimley-Horn: Kellie Clark and Alyssa Ford
- Members of the Public (sign in sheet attached)

During this meeting, Kimley-Horn presented the information in the attached PowerPoint. This provided an overview of the project, the existing results for Study Area C, and potential improvements. There was then time for the public to ask questions and provide feedback on the model results so far. The resulting map and comments are also attached.

PUBLIC MEETING RESIDENT LIST FOR AREA C

Name	Phone #	Email	Address
John Lamb	309-662-4408	John.s.lamb@gmail.com	636 12th Ave S
Barbara Lamb	309-287-4408	BJLL957@gmail.com	636 12th Ave S
David Healy	630-292-1000	dheely@healybender.com	1325 7th ST S #6c

Kimley»Horn

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City of Naples Basin Studies

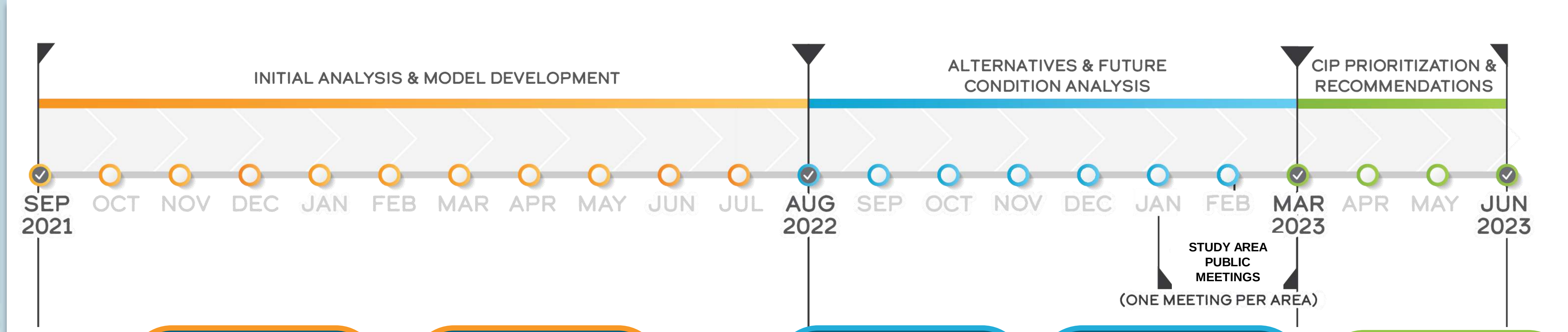
Area C Public Meeting

Project Overview

- Five areas of interest across the City of Naples are being studied with the goal to reduce the impacts of flooding during storm events (Study Areas A-E)
- The five areas chosen were identified as vulnerable to flooding or water quality issues
- Project kicked off on September 22, 2021

Kimley»Horn

Project Schedule



Developing a stormwater model that will simulate the impacts of rainfall and sea level rise and help determine the extents of flooding

Confirming locations of flooding to determine stormwater infrastructure improvements

Creating a proposed conditions model that simulates the effects of proposed improvements (improvements could include adding new infrastructure or replacing current

Simulating a future conditions scenario to determine how resilient the proposed improvements are taking into account future conditions such as sea level rise

Completing a cost benefit analysis to support recommended improvements to incorporate short term, medium term, and long term (CIP prioritization)

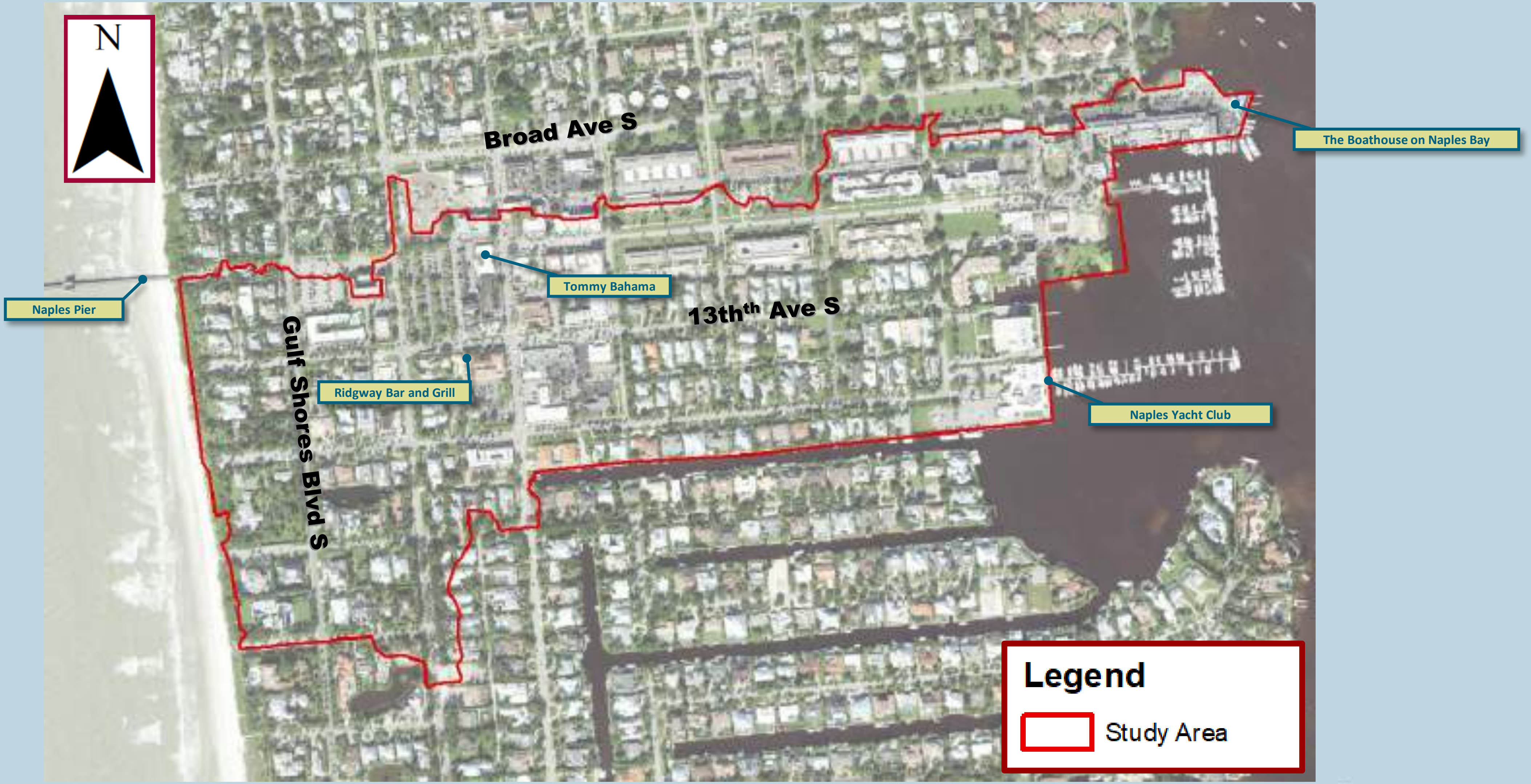
Kimley»Horn

Project Goals

1. Developing a stormwater model that will simulate the impacts of rainfall and sea level rise and help determine the extents of flooding
2. Protection of and improvement to the City's surface and ground water resources
3. Protection of public and private property
4. Protection and restoration of ecology
5. Planning for wise and strategic stormwater management system investments
6. Planning for sustainability and resiliency relating to anticipated climate change

Kimley»Horn

Study Area C

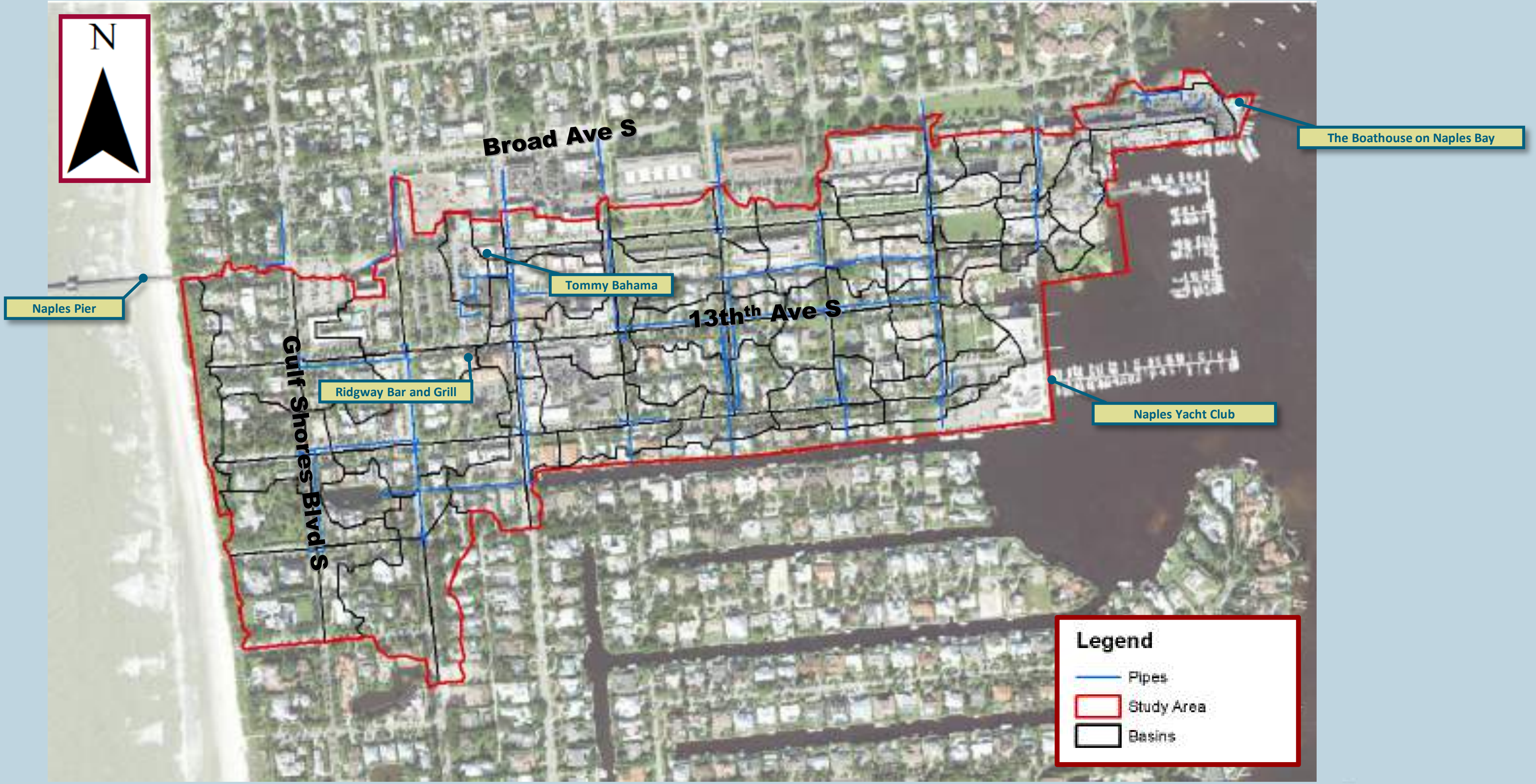


Kimley»Horn

Data Collection

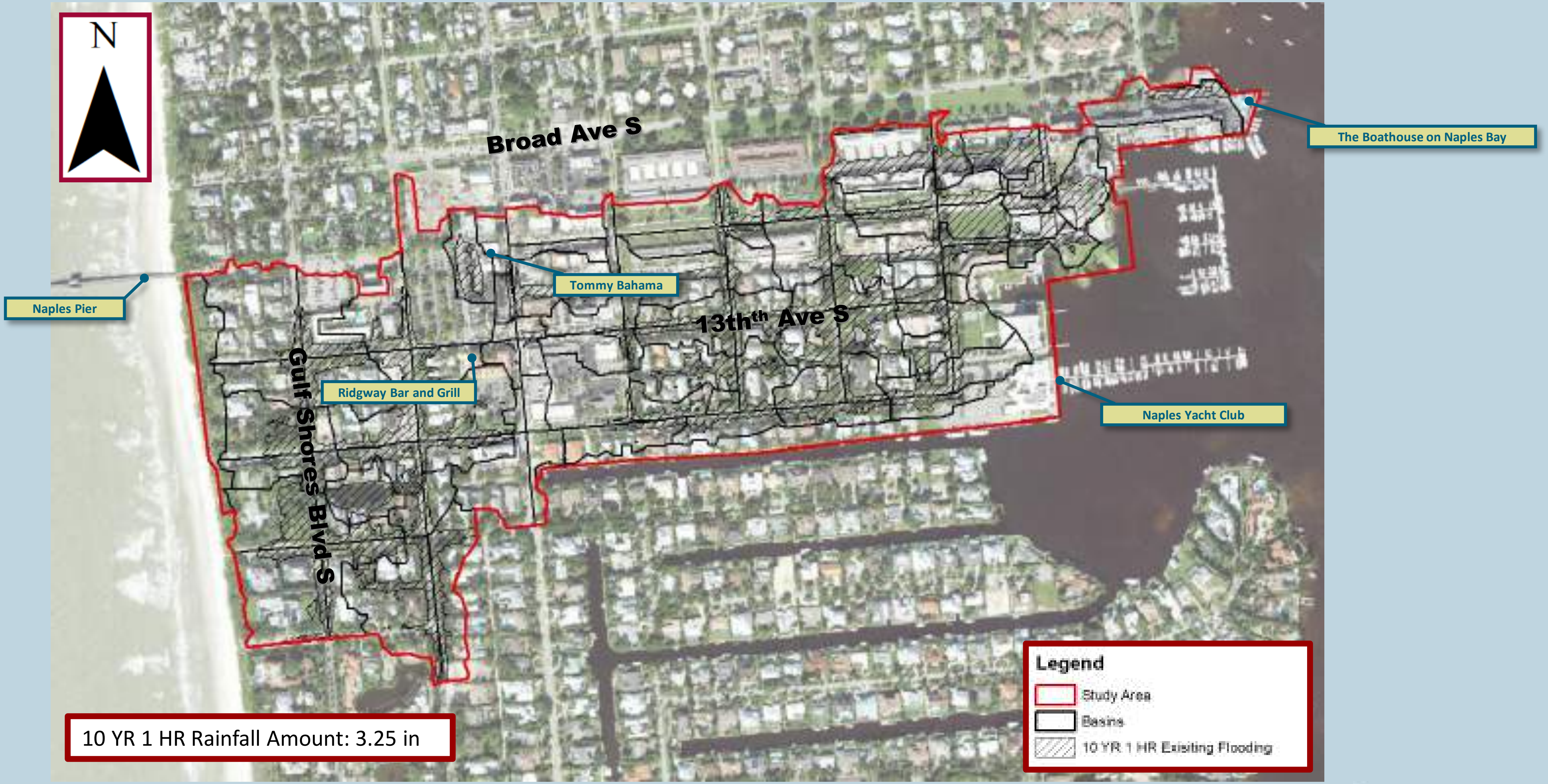
Kimley»Horn

Model Development



Kimley»Horn

Model Results

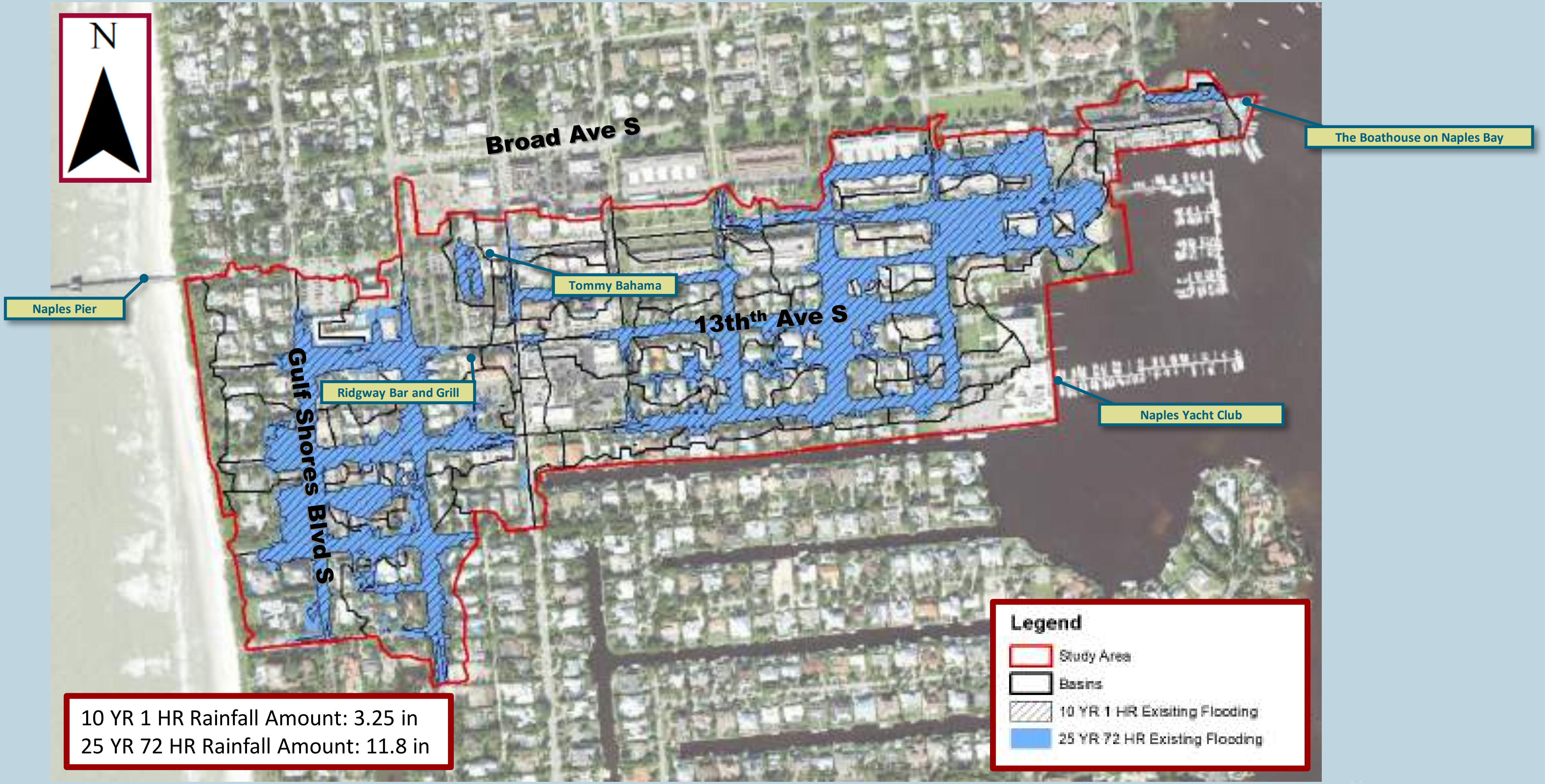


Kimley»Horn

Model Results

Kimley»Horn

Model Results



10 YR 1 HR Rainfall Amount: 3.25 in
25 YR 72 HR Rainfall Amount: 11.8 in

Potential Improvements

Short-term strategies

- Increase pipe sizes
- Add additional pipe runs
- Rerouting pipe networks
- Increase existing pump capacity
- Add new pumps
- Add check valves

Long-term strategies

- All the above strategies
- Raise roads
- Add or raise seawalls

We Welcome Input

- Feedback on flooding
- Questions on potential improvement strategies

Kimley»Horn

Please visit us at the booths to provide your input and feedback.

Thank you!

Kimley»Horn

Multi-Basin Stormwater Studies

Study Area C

Kimley»Horn

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PUBLIC COMMENTS COLLECTED DURING PUBLIC MEETING

The comment numbers below correspond with the numbers called out in the attached exhibit.

COMMENT #	COMMENT
1	At least 2 blocks south on 6th St. S. has experienced significant flooding of approximately 1 foot or up to the rims of their back tires. Flooding has been seen along 13th Ave S. between 6th St. S. and 7th St. S. Inlets in the alleyway along 13th Ave S. get clogged with debris, causing flooding. Flooding has been seen along 12th Ave S. between 6th St. S. and 7th St. S. On the corner of 12th Ave S. and 7th St. S, drainage improvements have helped reduce local sidwalk flooding.

After the meeting, the public's comments were loaded into the public coordination website.

MEETING NOTES
Public Meeting for Study Areas D and E
City of Naples Multi-Basin Stormwater Assessments
March 7, 2023, 3:00 PM
River Park Community Center

Attendees

- City of Naples: Eddie Bliss, Samantha McEnhill, and Bob Middleton
- Kimley-Horn: Kellie Clark and Alyssa Ford
- Members of the Public (sign in sheet attached)

During this meeting, Kimley-Horn presented the information in the attached PowerPoint. This provided an overview of the project, the existing results for Study Areas D and E, and potential improvements. There was then time for the public to ask questions and provide feedback on the model results so far. The resulting map and comments are also attached.

PUBLIC MEETING RESIDENT LIST FOR AREA D&E

Name	Phone #	Email	Address
Paul Lindabury	239-248-1904	pdlindaburt@gmail.com	
Dan Jeffery	541-490-4735		
Greg Gleis	502-352-4645		

Kimley»Horn

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City of Naples Basin Studies

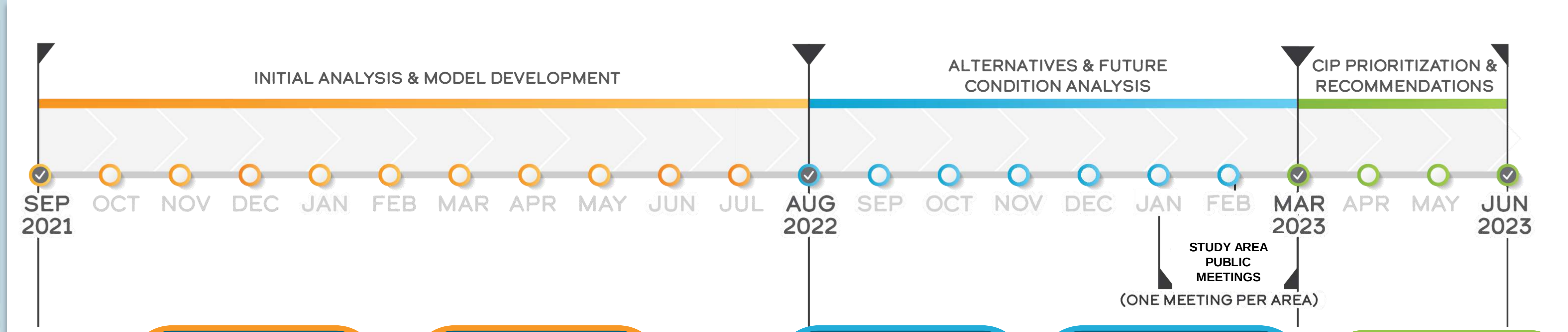
Areas D & E Public Meeting

Project Overview

- Five areas of interest across the City of Naples are being studied with the goal to reduce the impacts of flooding during storm events (Study Areas A-E)
- The five areas chosen were identified as vulnerable to flooding or water quality issues
- Project kicked off on September 22, 2021

Kimley»Horn

Project Schedule



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Kimley»Horn

Project Goals

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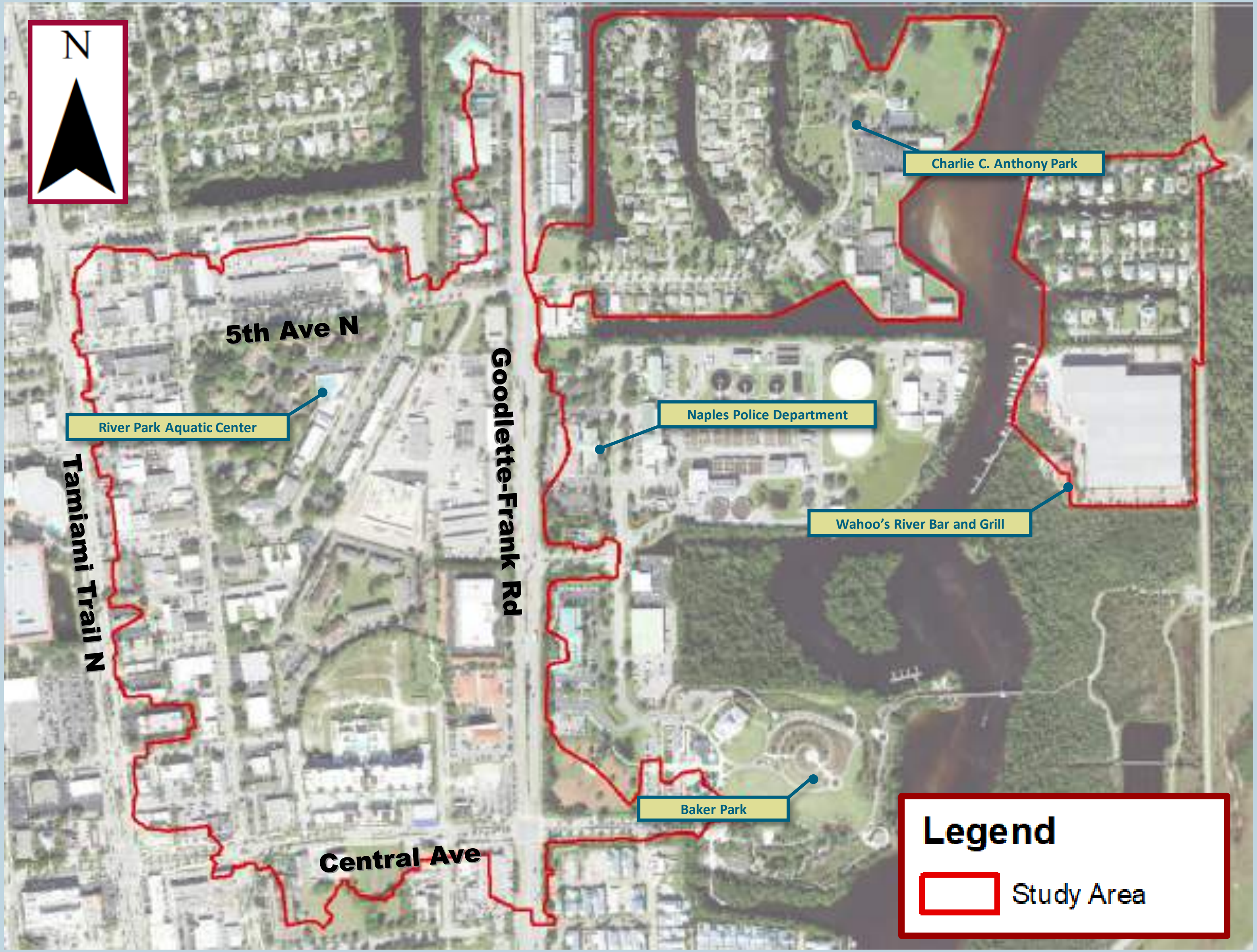
5. Planning for wise and strategic stormwater management system investments

6. Planning for sustainability and resiliency relating to anticipated climate change

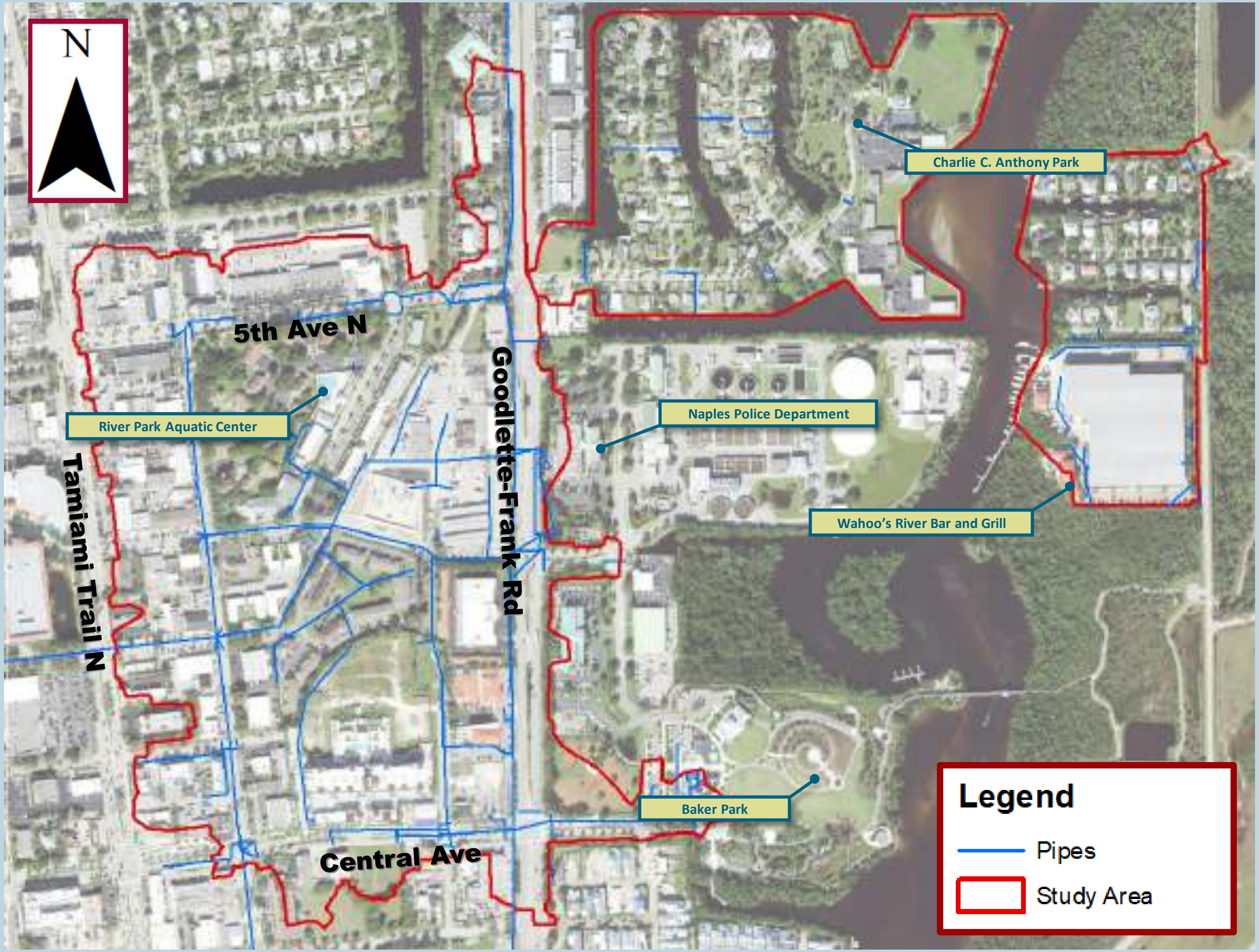
Kimley»Horn

Study Areas D & E



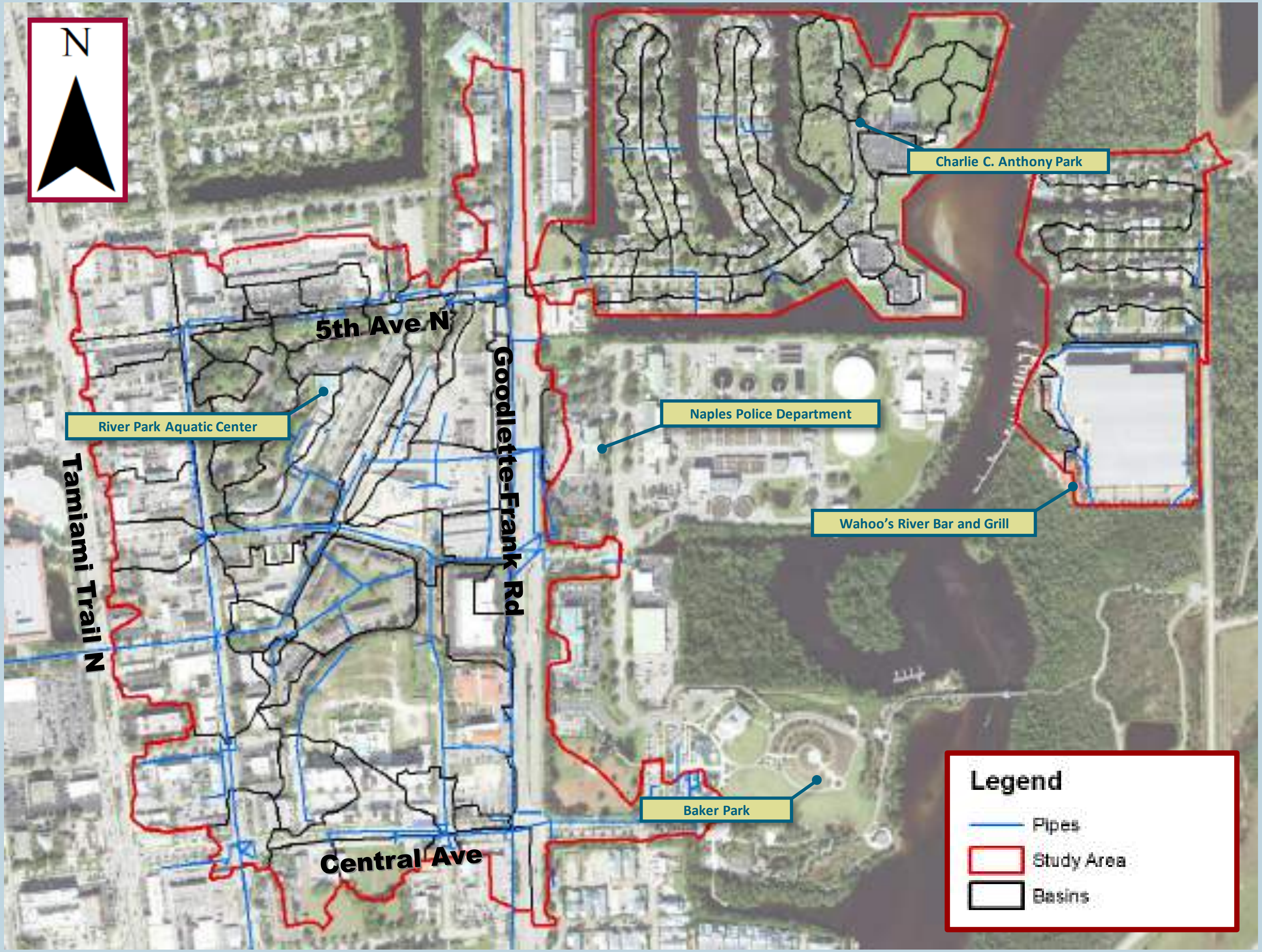
Kimley»Horn

Data Collection



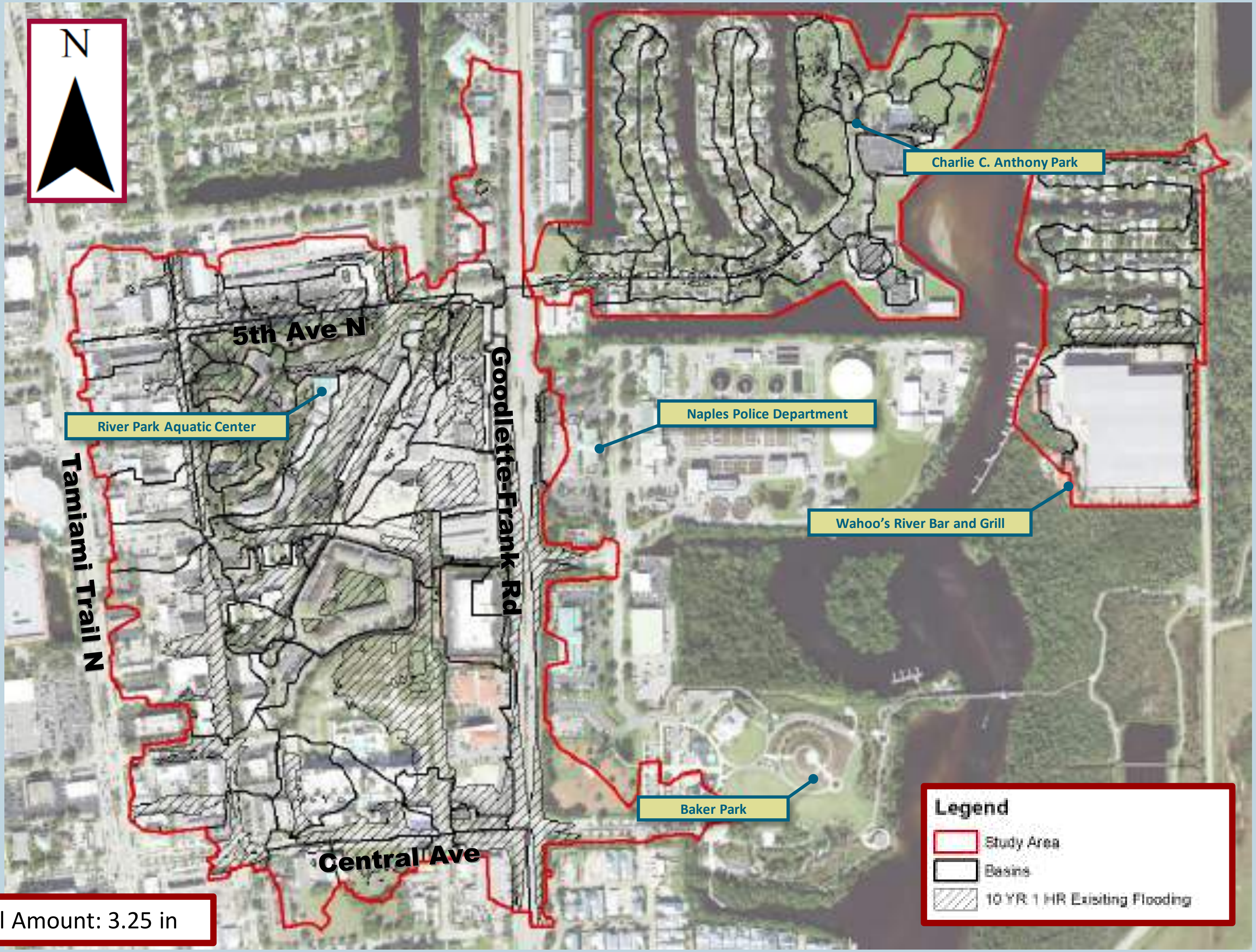
Kimley»Horn

Model Development



Kimley»Horn

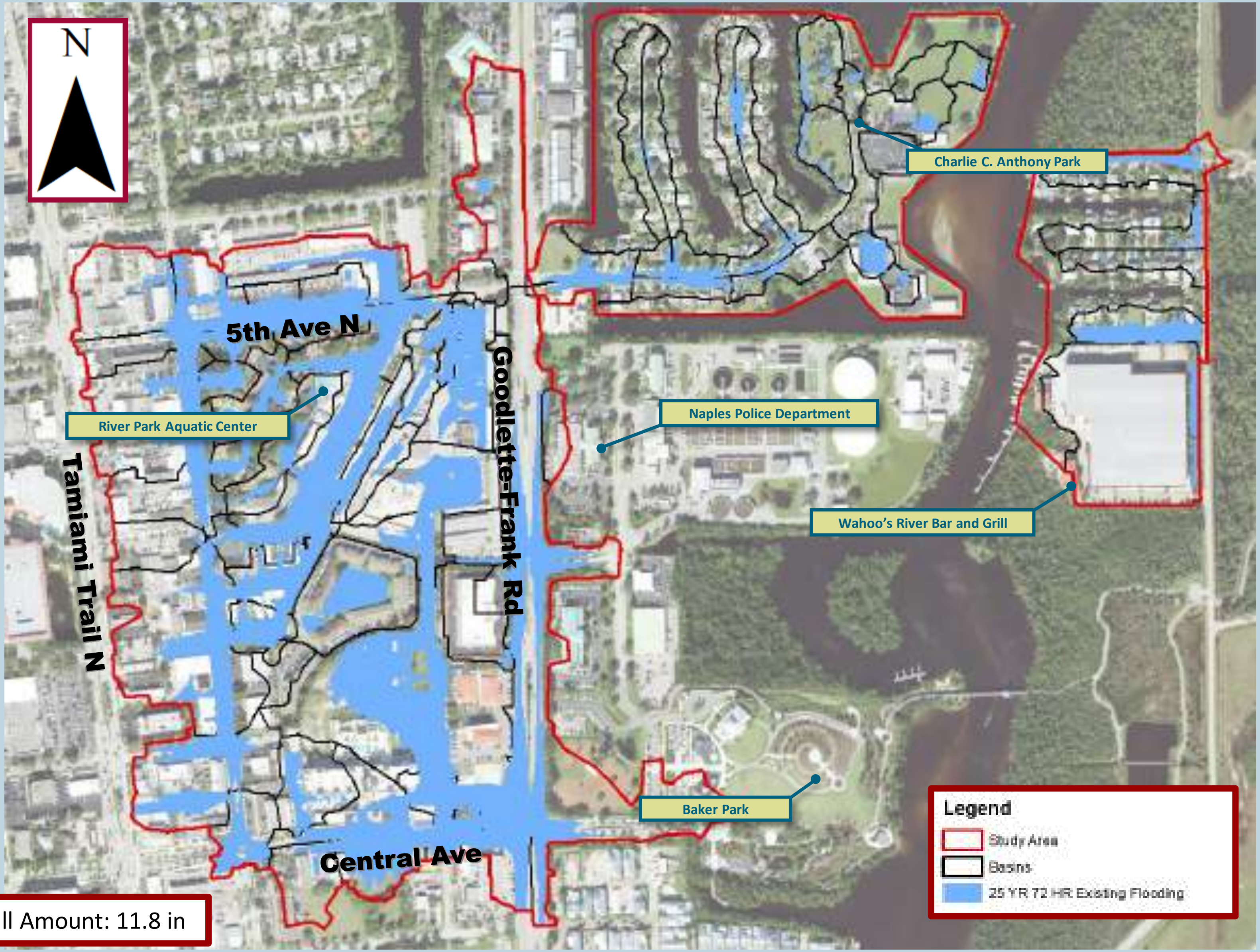
Model Results



10 YR 1 HR Rainfall Amount: 3.25 in

Kimley»Horn

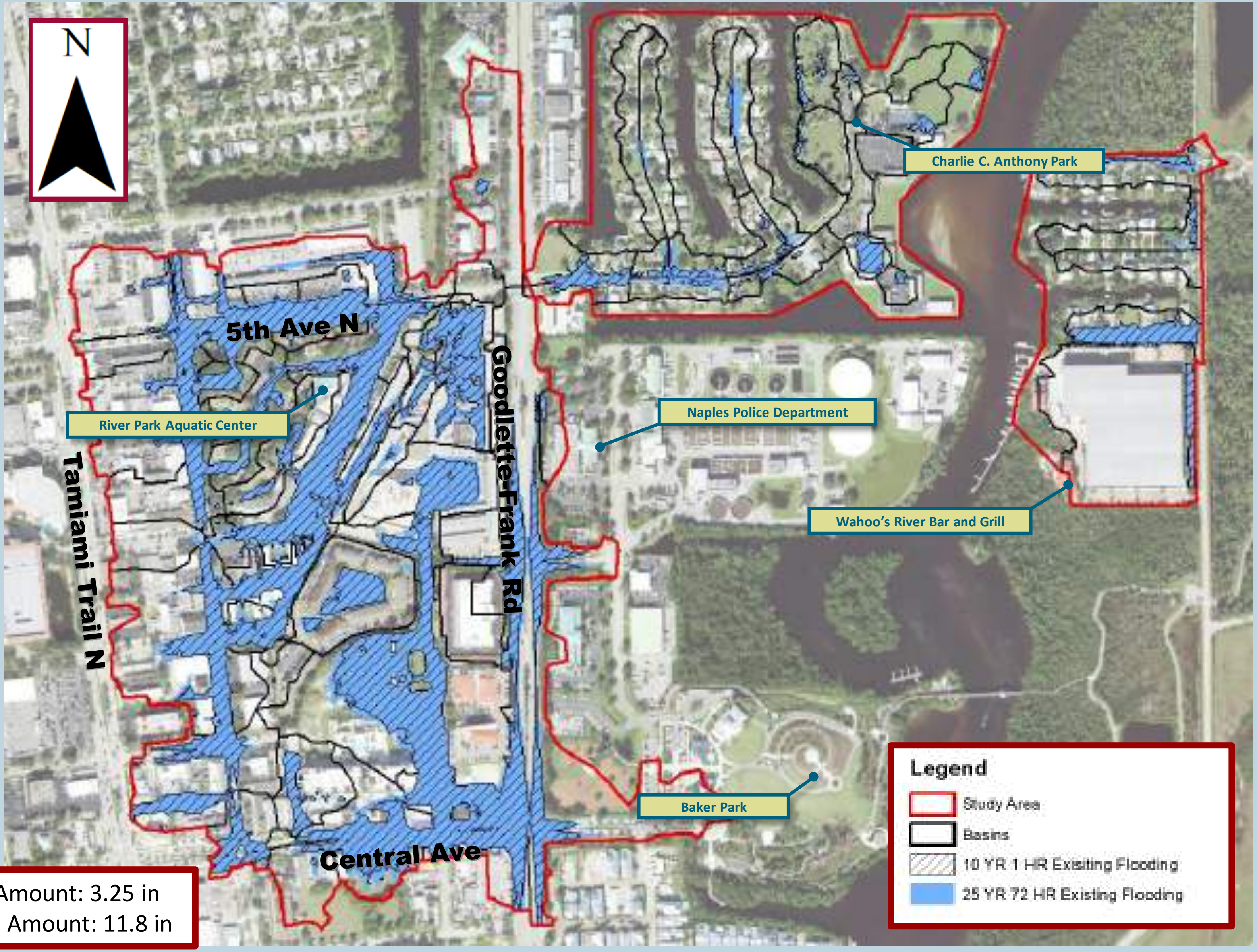
Model Results



25 YR 72 HR Rainfall Amount: 11.8 in

Kimley»Horn

Model Results



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Kimley»Horn

Potential Improvements

Short-term strategies

- Increase pipe sizes
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Long-term strategies

- All the above strategies
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Kimley»Horn

We Welcome Input

- Feedback on flooding
- Questions on potential improvement strategies

Kimley»Horn

Please visit us at the booths to provide your input and feedback.

Thank you!

Kimley»Horn

Multi-Basin Stormwater Studies

Study Areas D & E

PUBLIC COMMENTS COLLECTED DURING PUBLIC MEETING

The comment numbers below correspond with the numbers called out in the attached exhibit.

COMMENT #	COMMENT
1	Drainage improvement in Central Ave roundabout has reduced flooding. Mentioned that building does not flood. When asked if they would expect to see flooding in their parking lot during a large storm event they responded yes.
2	No flooding issues noted.

After the meeting, the public's comments were loaded into the public coordination website.

APPENDIX B MODEL RESULTS

Existing Conditions

Kimley»Horn

Area North Existing Conditions (North)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]
10 YR 1 HR	N-ABA	1.59
10 YR 1 HR	N-ABA-A01	3.66
10 YR 1 HR	N-ABA-A02	3.83
10 YR 1 HR	N-ABB	1.59
10 YR 1 HR	N-ABB-A01	3.57
10 YR 1 HR	N-ABB-A02	4.23
10 YR 1 HR	N-ABB-A03	4.23
10 YR 1 HR	N-ABB-A04	4.23
10 YR 1 HR	N-ABB-B02	4.25
10 YR 1 HR	N-ABB-B03	4.27
10 YR 1 HR	N-ABB-B03x	4.28
10 YR 1 HR	N-ABB-B04	4.28
10 YR 1 HR	N-ABC	1.59
10 YR 1 HR	N-ABC-A01	4.21
10 YR 1 HR	N-ABC-A02	4.22
10 YR 1 HR	N-ABC-B02	4.21
10 YR 1 HR	N-ABD	1.59
10 YR 1 HR	N-ABD-A01	3.33
10 YR 1 HR	N-ABD-A02	4.06
10 YR 1 HR	N-ABD-A02x	3.76
10 YR 1 HR	N-ABD-A03	4.64
10 YR 1 HR	N-ABD-A03x	4.11
10 YR 1 HR	N-ABD-A04	4.95
10 YR 1 HR	N-ABD-A05	5.18
10 YR 1 HR	N-ABD-A06	5.19
10 YR 1 HR	N-ABD-A07	5.19
10 YR 1 HR	N-ABD-B04	5.43
10 YR 1 HR	N-ABD-B05	5.52
10 YR 1 HR	N-ABD-B05x	5.43
10 YR 1 HR	N-ABD-B06	5.53
10 YR 1 HR	N-ABD-B07	6.17
10 YR 1 HR	N-ABD-B08	7.41
10 YR 1 HR	N-ABE	1.59
10 YR 1 HR	N-ABE-A01	2.05
10 YR 1 HR	N-ABE-A02	2.68
10 YR 1 HR	N-ABF	1.59
10 YR 1 HR	N-ABF-A01	4.11
10 YR 1 HR	N-ABF-A02	4.11
10 YR 1 HR	N-ABG	1.59
10 YR 1 HR	N-ABG-A01	4.53
10 YR 1 HR	N-ABG-A02	4.76
10 YR 1 HR	N-ABG-A03	4.79
10 YR 1 HR	N-ABH	1.59
10 YR 1 HR	N-ABH-A01	4.07

Kimley»Horn

Area North Existing Conditions (North)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]
10 YR 1 HR	N-ABH-A02	4.98
10 YR 1 HR	N-ABH-A03	4.98
10 YR 1 HR	N-ABH-A03x	4.98
10 YR 1 HR	N-ABH-B02	5.02
10 YR 1 HR	N-ABH-B03	5.03
10 YR 1 HR	N-ABH-B03x	5.03
10 YR 1 HR	N-ABH-B04	5.04
10 YR 1 HR	N-ABI	1.59
10 YR 1 HR	N-ABI-A01	4.93
10 YR 1 HR	N-ABI-A02	4.93
10 YR 1 HR	N-ABJ	1.59
10 YR 1 HR	N-ABJ-A01	4.95
10 YR 1 HR	N-ABJ-A02	4.95
10 YR 1 HR	N-ABK	1.59
10 YR 1 HR	N-ABK-A01	3.71
10 YR 1 HR	N-ABK-A02x1	5.66
10 YR 1 HR	N-ABK-A02x2	5.67
10 YR 1 HR	N-ABK-B02	4.99
10 YR 1 HR	N-ABK-B03	4.99
10 YR 1 HR	N-ABK-B04	7.48
10 YR 1 HR	N-ABL	1.59
10 YR 1 HR	N-ABL-A01	3.41
10 YR 1 HR	N-ABL-A02	4.33
10 YR 1 HR	N-ABM	1.59
10 YR 1 HR	N-ABM-A01	4.74
10 YR 1 HR	N-ABM-A02	4.74
10 YR 1 HR	N-ABN	1.59
10 YR 1 HR	N-ABN-A01	9.68
10 YR 1 HR	N-ABO	1.59
10 YR 1 HR	N-ABO-A01	3.81
10 YR 1 HR	N-ABO-A02	5.2
10 YR 1 HR	N-ABP	1.59
10 YR 1 HR	N-ABQ	1.59
10 YR 1 HR	N-ADA-A01	6.1
10 YR 1 HR	N-ADA-A02	6.92
10 YR 1 HR	N-ADA-A03	6.93
10 YR 1 HR	N-ADA-A03x	6.92
10 YR 1 HR	N-ADA-A04	6.94
10 YR 1 HR	N-ADA-A05	6.94
10 YR 1 HR	N-ADA-B02	6.57
10 YR 1 HR	N-ADA-B03	6.57
10 YR 1 HR	N-ADA-B03x	6.57
10 YR 1 HR	N-ADA-B04	7.22
10 YR 1 HR	N-ADB-08	7.07

Kimley»Horn

Area North Existing Conditions (North)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]
10 YR 1 HR	N-ADB-A01	7.3
10 YR 1 HR	N-ADB-A02	7.48
10 YR 1 HR	N-ADB-A03	8.47
10 YR 1 HR	N-ADB-A04	8.84
10 YR 1 HR	N-ADB-A04x	8.76
10 YR 1 HR	N-ADB-B03	7.49
10 YR 1 HR	N-ADB-B04	8.83
10 YR 1 HR	N-ADB-B05	8.86
10 YR 1 HR	N-ADB-B06	9.16
10 YR 1 HR	N-ADB-B07	9.7
10 YR 1 HR	N-ADB-B07x	9.66
10 YR 1 HR	N-ADC-A01	7.96
10 YR 1 HR	N-ADC-A02	7.97
10 YR 1 HR	N-ADD-A01	7.8
10 YR 1 HR	N-ADD-A02	7.93
10 YR 1 HR	N-ADD-A03	10.93
10 YR 1 HR	N-ADD-A04	10.93
10 YR 1 HR	N-ADD-A04x	10.93
10 YR 1 HR	N-ADD-A05	10.98
10 YR 1 HR	N-ADD-A06	10.99
10 YR 1 HR	N-ADD-A07	12.51
10 YR 1 HR	N-ADD-A08	12.53
10 YR 1 HR	N-ADD-A09	12.59
10 YR 1 HR	N-ADD-A10	12.59
10 YR 1 HR	N-ADD-A11	12.64
10 YR 1 HR	N-ADD-A12	13.08
10 YR 1 HR	N-ADD-A13	13.36
10 YR 1 HR	N-ADD-A14	13.37
10 YR 1 HR	N-ADD-A15	13.35
10 YR 1 HR	N-ADD-A16	13.25
10 YR 1 HR	N-ADD-B03	7.95
10 YR 1 HR	N-ADD-B05	11.67
10 YR 1 HR	N-ADD-C04	10.94
10 YR 1 HR	N-ADD-C05	11.24
10 YR 1 HR	N-ADD-D08	12.01
10 YR 1 HR	N-ADD-D09	11.87
10 YR 1 HR	N-ADD-H04	10.93
10 YR 1 HR	N-ADD-N13	12.88
10 YR 1 HR	N-ADD-N14	13.15
10 YR 1 HR	N-ADD-N15	12.55
10 YR 1 HR	N-ADE-A01	6.96
10 YR 1 HR	N-ADE-A02	8.4
10 YR 1 HR	N-ADE-A03	8.68
10 YR 1 HR	N-ADE-A04	9.1

Sim	Node Name	Existing Maximum Stage [ft]
10 YR 1 HR	N-ADE-A04x	8.7
10 YR 1 HR	N-ADE-A05	10.84
10 YR 1 HR	N-ADE-A05x	9.1
10 YR 1 HR	N-ADE-A06	11.2
10 YR 1 HR	N-ADE-B02	7.01
10 YR 1 HR	N-ADE-B03	7.02
10 YR 1 HR	N-ADE-C02	7.52
10 YR 1 HR	N-ADE-C03	7.54
10 YR 1 HR	N-ADE-D03	7
10 YR 1 HR	N-ADS-A01	5.67
10 YR 1 HR	N-ADS-A02	5.99
10 YR 1 HR	N-ASA-A01	5.41
10 YR 1 HR	N-ASA-A02	5.41
10 YR 1 HR	N-ASA-A03	5.61
10 YR 1 HR	N-ASA-A04	5.72
10 YR 1 HR	N-ASA-A05	5.89
10 YR 1 HR	N-ASA-A06	6.09
10 YR 1 HR	N-ASA-A07	6.12
10 YR 1 HR	N-ASB-A01	5.55
10 YR 1 HR	N-ASB-A02	5.55
10 YR 1 HR	N-ASB-B02	5.8
10 YR 1 HR	N-ASC-A01	5.32
10 YR 1 HR	N-ASC-A02	5.99
10 YR 1 HR	N-ASC-A03	6.24
10 YR 1 HR	N-ASC-A04	6.5
10 YR 1 HR	N-ASC-B02	5.61
10 YR 1 HR	N-ASC-B03	5.65
10 YR 1 HR	N-ASD-A01a	5.82
10 YR 1 HR	N-ASD-A02	8.07
10 YR 1 HR	N-ASD-A03	8.89
10 YR 1 HR	N-ASD-A04	9.95
10 YR 1 HR	N-ASD-A05	10.3
10 YR 1 HR	N-ASD-A06	10.99
10 YR 1 HR	N-ASD-A07	11.55
10 YR 1 HR	N-ASD-A08	12.21
10 YR 1 HR	N-ASD-A09	13.04
10 YR 1 HR	N-ASD-A11	14.02
10 YR 1 HR	N-ASD-A12	14.91
10 YR 1 HR	N-ASD-A13	15.49
10 YR 1 HR	N-ASD-A14	15.82
10 YR 1 HR	N-ASD-A15	16.4
10 YR 1 HR	N-ASD-A16	14.3
10 YR 1 HR	N-ASD-A17	16.61
10 YR 1 HR	N-ASD-A18	15.58

Sim	Node Name	Existing Maximum Stage [ft]
10 YR 1 HR	N-ASD-A19	14.92
10 YR 1 HR	N-ASD-B02	5.9
10 YR 1 HR	N-ASD-B03	7.08
10 YR 1 HR	N-ASD-B04	7.52
10 YR 1 HR	N-ASD-B05	8.63
10 YR 1 HR	N-ASD-C03	6.06
10 YR 1 HR	N-ASD-C04	6.08
10 YR 1 HR	N-ASD-D04	7.85
10 YR 1 HR	N-ASD-D05	8.43
10 YR 1 HR	N-ASD-D06	8.14
10 YR 1 HR	N-ASD-D07	8.49
10 YR 1 HR	N-ASD-E04	9.39
10 YR 1 HR	N-ASD-E05	10.23
10 YR 1 HR	N-ASD-E06	10.4
10 YR 1 HR	N-ASD-E09	14.14
10 YR 1 HR	N-ASD-E10	13.84
10 YR 1 HR	N-ASD-F03	8.62
10 YR 1 HR	N-ASD-F04	9.24
10 YR 1 HR	N-ASD-F05	9.67
10 YR 1 HR	N-ASD-G04	8.9
10 YR 1 HR	N-ASD-H07	9.29
10 YR 1 HR	N-ASD-H08	9.42
10 YR 1 HR	N-ASD-I09	10.85
10 YR 1 HR	N-ASD-J10	12.51
10 YR 1 HR	N-ASD-K10	13.86
10 YR 1 HR	N-ASD-L07	10.46
10 YR 1 HR	N-ASD-Q06	10.32
10 YR 1 HR	N-ASD-Q08	11.23
10 YR 1 HR	N-ASD-Q09	12.64
10 YR 1 HR	N-ASD-R13	14.22
10 YR 1 HR	N-ASD-S13	14.84
10 YR 1 HR	N-ASD-T15	16.56
10 YR 1 HR	N-ASD-U06	10.26
10 YR 1 HR	N-ASE-A01	5.62
10 YR 1 HR	N-ASE-A02	5.82
10 YR 1 HR	N-ASE-A03	7.99
10 YR 1 HR	N-ASE-A04	7.99
10 YR 1 HR	N-ASE-A05	11.37
10 YR 1 HR	N-ASE-B02	5.67
10 YR 1 HR	N-ASE-C03	6.14
10 YR 1 HR	N-ASE-D03	6.79
10 YR 1 HR	N-ASF-A01	6.28
10 YR 1 HR	N-ASF-A02	6.28
10 YR 1 HR	N-ASG-A01	5.69

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Area North Existing Conditions (North)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]
10 YR 1 HR	N-ASG-A02	6.03
10 YR 1 HR	N-ASG-A03	6.51
10 YR 1 HR	N-ASG-A04	7.03
10 YR 1 HR	N-ASG-A05	7.03
10 YR 1 HR	N-ASG-A06	7.11
10 YR 1 HR	N-ASG-B02	5.72
10 YR 1 HR	N-ASG-B03x	5.72
10 YR 1 HR	N-ASG-C04	6.42
10 YR 1 HR	N-ASG-C05	6.4
10 YR 1 HR	N-ASH-A01	5.56
10 YR 1 HR	N-ASH-A02	5.65
10 YR 1 HR	N-ASI-A01	5.43
10 YR 1 HR	N-ASJ	1.59
10 YR 1 HR	N-ASJ-A01	5.69
10 YR 1 HR	N-ASK-A01	5.42

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Area North Existing Conditions (North)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]
25 YR 72 HR	N-ABA	1.59
25 YR 72 HR	N-ABA-A01	4.85
25 YR 72 HR	N-ABA-A02	4.85
25 YR 72 HR	N-ABB	1.59
25 YR 72 HR	N-ABB-A01	4.04
25 YR 72 HR	N-ABB-A02	4.87
25 YR 72 HR	N-ABB-A03	4.88
25 YR 72 HR	N-ABB-A04	4.88
25 YR 72 HR	N-ABB-B02	4.87
25 YR 72 HR	N-ABB-B03	4.87
25 YR 72 HR	N-ABB-B03x	4.87
25 YR 72 HR	N-ABB-B04	4.87
25 YR 72 HR	N-ABC	1.59
25 YR 72 HR	N-ABC-A01	4.89
25 YR 72 HR	N-ABC-A02	4.89
25 YR 72 HR	N-ABC-B02	4.89
25 YR 72 HR	N-ABD	1.59
25 YR 72 HR	N-ABD-A01	4.91
25 YR 72 HR	N-ABD-A02	4.92
25 YR 72 HR	N-ABD-A02x	4.92
25 YR 72 HR	N-ABD-A03	5.22
25 YR 72 HR	N-ABD-A03x	4.93
25 YR 72 HR	N-ABD-A04	5.6
25 YR 72 HR	N-ABD-A05	5.66
25 YR 72 HR	N-ABD-A06	5.28
25 YR 72 HR	N-ABD-A07	5.28
25 YR 72 HR	N-ABD-B04	5.73
25 YR 72 HR	N-ABD-B05	5.74
25 YR 72 HR	N-ABD-B05x	5.72
25 YR 72 HR	N-ABD-B06	5.74
25 YR 72 HR	N-ABD-B07	6.82
25 YR 72 HR	N-ABD-B08	7.49
25 YR 72 HR	N-ABE	1.59
25 YR 72 HR	N-ABE-A01	4.89
25 YR 72 HR	N-ABE-A02	4.89
25 YR 72 HR	N-ABF	1.59
25 YR 72 HR	N-ABF-A01	4.88
25 YR 72 HR	N-ABF-A02	4.89
25 YR 72 HR	N-ABG	1.59
25 YR 72 HR	N-ABG-A01	5.04
25 YR 72 HR	N-ABG-A02	5.04
25 YR 72 HR	N-ABG-A03	5.05
25 YR 72 HR	N-ABH	1.59
25 YR 72 HR	N-ABH-A01	4.6

Sim	Node Name	Existing Maximum Stage [ft]
25 YR 72 HR	N-ABH-A02	5.53
25 YR 72 HR	N-ABH-A03	5.53
25 YR 72 HR	N-ABH-A03x	5.53
25 YR 72 HR	N-ABH-B02	5.57
25 YR 72 HR	N-ABH-B03	5.58
25 YR 72 HR	N-ABH-B03x	5.59
25 YR 72 HR	N-ABH-B04	5.59
25 YR 72 HR	N-ABI	1.59
25 YR 72 HR	N-ABI-A01	5.52
25 YR 72 HR	N-ABI-A02	5.52
25 YR 72 HR	N-ABJ	1.59
25 YR 72 HR	N-ABJ-A01	5.52
25 YR 72 HR	N-ABJ-A02	5.52
25 YR 72 HR	N-ABK	1.59
25 YR 72 HR	N-ABK-A01	4.39
25 YR 72 HR	N-ABK-A02x1	6.85
25 YR 72 HR	N-ABK-A02x2	6.86
25 YR 72 HR	N-ABK-B02	5.47
25 YR 72 HR	N-ABK-B03	5.47
25 YR 72 HR	N-ABK-B04	7.51
25 YR 72 HR	N-ABL	1.59
25 YR 72 HR	N-ABL-A01	5.23
25 YR 72 HR	N-ABL-A02	5.22
25 YR 72 HR	N-ABM	1.59
25 YR 72 HR	N-ABM-A01	5.22
25 YR 72 HR	N-ABM-A02	5.22
25 YR 72 HR	N-ABN	1.59
25 YR 72 HR	N-ABN-A01	9.84
25 YR 72 HR	N-ABO	1.59
25 YR 72 HR	N-ABO-A01	4.42
25 YR 72 HR	N-ABO-A02	5.48
25 YR 72 HR	N-ABP	1.59
25 YR 72 HR	N-ABQ	1.59
25 YR 72 HR	N-ADA-A01	6.84
25 YR 72 HR	N-ADA-A02	7.42
25 YR 72 HR	N-ADA-A03	7.42
25 YR 72 HR	N-ADA-A03x	7.41
25 YR 72 HR	N-ADA-A04	7.44
25 YR 72 HR	N-ADA-A05	7.44
25 YR 72 HR	N-ADA-B02	7.08
25 YR 72 HR	N-ADA-B03	7.07
25 YR 72 HR	N-ADA-B03x	7.07
25 YR 72 HR	N-ADA-B04	7.24
25 YR 72 HR	N-ADB-08	7.46

Sim	Node Name	Existing Maximum Stage [ft]
25 YR 72 HR	N-ADB-A01	7.6
25 YR 72 HR	N-ADB-A02	7.61
25 YR 72 HR	N-ADB-A03	8.59
25 YR 72 HR	N-ADB-A04	8.88
25 YR 72 HR	N-ADB-A04x	8.83
25 YR 72 HR	N-ADB-B03	7.62
25 YR 72 HR	N-ADB-B04	8.94
25 YR 72 HR	N-ADB-B05	8.97
25 YR 72 HR	N-ADB-B06	9.25
25 YR 72 HR	N-ADB-B07	9.87
25 YR 72 HR	N-ADB-B07x	9.8
25 YR 72 HR	N-ADC-A01	8.23
25 YR 72 HR	N-ADC-A02	8.23
25 YR 72 HR	N-ADD-A01	8.55
25 YR 72 HR	N-ADD-A02	8.75
25 YR 72 HR	N-ADD-A03	10.99
25 YR 72 HR	N-ADD-A04	10.99
25 YR 72 HR	N-ADD-A04x	10.99
25 YR 72 HR	N-ADD-A05	11.03
25 YR 72 HR	N-ADD-A06	11.04
25 YR 72 HR	N-ADD-A07	12.55
25 YR 72 HR	N-ADD-A08	12.57
25 YR 72 HR	N-ADD-A09	12.63
25 YR 72 HR	N-ADD-A10	12.63
25 YR 72 HR	N-ADD-A11	12.67
25 YR 72 HR	N-ADD-A12	13.12
25 YR 72 HR	N-ADD-A13	13.39
25 YR 72 HR	N-ADD-A14	13.38
25 YR 72 HR	N-ADD-A15	13.36
25 YR 72 HR	N-ADD-A16	13.26
25 YR 72 HR	N-ADD-B03	8.8
25 YR 72 HR	N-ADD-B05	11.74
25 YR 72 HR	N-ADD-C04	11
25 YR 72 HR	N-ADD-C05	11.27
25 YR 72 HR	N-ADD-D08	12.02
25 YR 72 HR	N-ADD-D09	11.9
25 YR 72 HR	N-ADD-H04	10.99
25 YR 72 HR	N-ADD-N13	12.9
25 YR 72 HR	N-ADD-N14	13.17
25 YR 72 HR	N-ADD-N15	12.56
25 YR 72 HR	N-ADE-A01	7.76
25 YR 72 HR	N-ADE-A02	8.62
25 YR 72 HR	N-ADE-A03	8.76
25 YR 72 HR	N-ADE-A04	9.15

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Area North Existing Conditions (North)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]
25 YR 72 HR	N-ADE-A04x	8.78
25 YR 72 HR	N-ADE-A05	10.89
25 YR 72 HR	N-ADE-A05x	9.15
25 YR 72 HR	N-ADE-A06	11.25
25 YR 72 HR	N-ADE-B02	7.3
25 YR 72 HR	N-ADE-B03	7.3
25 YR 72 HR	N-ADE-C02	7.77
25 YR 72 HR	N-ADE-C03	7.78
25 YR 72 HR	N-ADE-D03	7.28
25 YR 72 HR	N-ADS-A01	6.41
25 YR 72 HR	N-ADS-A02	6.41
25 YR 72 HR	N-ASA-A01	5.51
25 YR 72 HR	N-ASA-A02	5.51
25 YR 72 HR	N-ASA-A03	5.78
25 YR 72 HR	N-ASA-A04	5.92
25 YR 72 HR	N-ASA-A05	6.09
25 YR 72 HR	N-ASA-A06	6.17
25 YR 72 HR	N-ASA-A07	6.19
25 YR 72 HR	N-ASB-A01	5.59
25 YR 72 HR	N-ASB-A02	5.59
25 YR 72 HR	N-ASB-B02	5.83
25 YR 72 HR	N-ASC-A01	5.68
25 YR 72 HR	N-ASC-A02	6.83
25 YR 72 HR	N-ASC-A03	7.11
25 YR 72 HR	N-ASC-A04	7.12
25 YR 72 HR	N-ASC-B02	6.17
25 YR 72 HR	N-ASC-B03	6.26
25 YR 72 HR	N-ASD-A01a	6.3
25 YR 72 HR	N-ASD-A02	8.51
25 YR 72 HR	N-ASD-A03	9.34
25 YR 72 HR	N-ASD-A04	10.42
25 YR 72 HR	N-ASD-A05	10.77
25 YR 72 HR	N-ASD-A06	11.44
25 YR 72 HR	N-ASD-A07	11.89
25 YR 72 HR	N-ASD-A08	12.44
25 YR 72 HR	N-ASD-A09	13.17
25 YR 72 HR	N-ASD-A11	14.09
25 YR 72 HR	N-ASD-A12	15.03
25 YR 72 HR	N-ASD-A13	15.62
25 YR 72 HR	N-ASD-A14	15.92
25 YR 72 HR	N-ASD-A15	16.41
25 YR 72 HR	N-ASD-A16	14.31
25 YR 72 HR	N-ASD-A17	16.62
25 YR 72 HR	N-ASD-A18	15.58

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Sim	Node Name	Existing Maximum Stage [ft]
25 YR 72 HR	N-ASD-A19	14.93
25 YR 72 HR	N-ASD-B02	6.43
25 YR 72 HR	N-ASD-B03	7.84
25 YR 72 HR	N-ASD-B04	8.09
25 YR 72 HR	N-ASD-B05	8.8
25 YR 72 HR	N-ASD-C03	8.95
25 YR 72 HR	N-ASD-C04	7.11
25 YR 72 HR	N-ASD-D04	8.96
25 YR 72 HR	N-ASD-D05	9
25 YR 72 HR	N-ASD-D06	8.77
25 YR 72 HR	N-ASD-D07	9.07
25 YR 72 HR	N-ASD-E04	9.84
25 YR 72 HR	N-ASD-E05	10.78
25 YR 72 HR	N-ASD-E06	10.98
25 YR 72 HR	N-ASD-E09	14.21
25 YR 72 HR	N-ASD-E10	13.9
25 YR 72 HR	N-ASD-F03	9
25 YR 72 HR	N-ASD-F04	9.28
25 YR 72 HR	N-ASD-F05	9.69
25 YR 72 HR	N-ASD-G04	9.35
25 YR 72 HR	N-ASD-H07	9.55
25 YR 72 HR	N-ASD-H08	9.55
25 YR 72 HR	N-ASD-I09	10.9
25 YR 72 HR	N-ASD-J10	12.54
25 YR 72 HR	N-ASD-K10	13.9
25 YR 72 HR	N-ASD-L07	11.3
25 YR 72 HR	N-ASD-Q06	10.93
25 YR 72 HR	N-ASD-Q08	11.7
25 YR 72 HR	N-ASD-Q09	12.78
25 YR 72 HR	N-ASD-R13	14.25
25 YR 72 HR	N-ASD-S13	14.85
25 YR 72 HR	N-ASD-T15	16.56
25 YR 72 HR	N-ASD-U06	10.79
25 YR 72 HR	N-ASE-A01	6.11
25 YR 72 HR	N-ASE-A02	6.38
25 YR 72 HR	N-ASE-A03	9.1
25 YR 72 HR	N-ASE-A04	9.11
25 YR 72 HR	N-ASE-A05	11.45
25 YR 72 HR	N-ASE-B02	6.14
25 YR 72 HR	N-ASE-C03	7.04
25 YR 72 HR	N-ASE-D03	7.87
25 YR 72 HR	N-ASF-A01	6.47
25 YR 72 HR	N-ASF-A02	6.47
25 YR 72 HR	N-ASG-A01	5.93

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Area North Existing Conditions (North)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]
25 YR 72 HR	N-ASG-A02	6.27
25 YR 72 HR	N-ASG-A03	6.8
25 YR 72 HR	N-ASG-A04	7.46
25 YR 72 HR	N-ASG-A05	7.46
25 YR 72 HR	N-ASG-A06	7.13
25 YR 72 HR	N-ASG-B02	5.94
25 YR 72 HR	N-ASG-B03x	5.94
25 YR 72 HR	N-ASG-C04	6.54
25 YR 72 HR	N-ASG-C05	6.45
25 YR 72 HR	N-ASH-A01	5.94
25 YR 72 HR	N-ASH-A02	5.94
25 YR 72 HR	N-ASI-A01	5.47
25 YR 72 HR	N-ASJ	1.59
25 YR 72 HR	N-ASJ-A01	5.71
25 YR 72 HR	N-ASK-A01	5.55

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Area South Existing Conditions (BCDE)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]
10 yr 1 hr	N-BA	1.59
10 yr 1 hr	N-BA-A01	3.33
10 yr 1 hr	N-BA-A02	3.37
10 yr 1 hr	N-BA-A03	3.4
10 yr 1 hr	N-BA-A03x	3.37
10 yr 1 hr	N-BA-A04	3.46
10 yr 1 hr	N-BA-A04x	3.4
10 yr 1 hr	N-BA-A05	3.46
10 yr 1 hr	N-BA-A06	3.58
10 yr 1 hr	N-BA-A07	3.65
10 yr 1 hr	N-BA-A07x	3.61
10 yr 1 hr	N-BA-A08	3.76
10 yr 1 hr	N-BA-A08x	3.65
10 yr 1 hr	N-BA-A09	3.91
10 yr 1 hr	N-BA-B02	3.26
10 yr 1 hr	N-BA-B03	3.26
10 yr 1 hr	N-BA-B04	3.25
10 yr 1 hr	N-BA-C03	3.33
10 yr 1 hr	N-BA-C04	3.32
10 yr 1 hr	N-BA-D05	3.48
10 yr 1 hr	N-BA-D06	3.49
10 yr 1 hr	N-BA-D07	3.65
10 yr 1 hr	N-BA-D08	3.72
10 yr 1 hr	N-BA-E09	3.76
10 yr 1 hr	N-BA-F09	3.87
10 yr 1 hr	N-BA-K04	3.39
10 yr 1 hr	N-BA-K05	3.41
10 yr 1 hr	N-BA-K06	3.6
10 yr 1 hr	N-BA-K08	5.06
10 yr 1 hr	N-BA-L06	3.54
10 yr 1 hr	N-BA-Q05	3.38
10 yr 1 hr	N-BA-Q06	3.38
10 yr 1 hr	N-BA-Q06x	3.38
10 yr 1 hr	N-BA-Q07	3.38
10 yr 1 hr	N-BA-Q07x	3.37
10 yr 1 hr	N-BA-Q08	3.39
10 yr 1 hr	N-BA-R06	3.39
10 yr 1 hr	N-BA-R07	3.38
10 yr 1 hr	N-BA-R07x	3.4
10 yr 1 hr	N-BA-R08	3.38
10 yr 1 hr	N-BA-R08x	3.39
10 yr 1 hr	N-BA-R09	3.38
10 yr 1 hr	N-BA-R10	3.38
10 yr 1 hr	N-BA-R11	3.37

Sim	Node Name	Existing Maximum Stage [ft]
10 yr 1 hr	N-BA-S06a	3.68
10 yr 1 hr	N-BA-T07	3.69
10 yr 1 hr	N-BA-T08	3.68
10 yr 1 hr	N-BA-T08x	3.69
10 yr 1 hr	N-BA-T09	3.4
10 yr 1 hr	N-BA-T09x	3.68
10 yr 1 hr	N-BA-T10	3.4
10 yr 1 hr	N-BA-U02	3.32
10 yr 1 hr	N-BA-U03	3.33
10 yr 1 hr	N-BA-V07	3.75
10 yr 1 hr	N-BA-W08	4.19
10 yr 1 hr	N-BA-W09A	4.2
10 yr 1 hr	N-BA-W09B	4.17
10 yr 1 hr	N-BB	1.59
10 yr 1 hr	N-BB-A01	3.32
10 yr 1 hr	N-BB-A02	3.33
10 yr 1 hr	N-BB-A03	3.31
10 yr 1 hr	N-BB-A04	3.32
10 yr 1 hr	N-BC	1.59
10 yr 1 hr	N-BC-A01	2.39
10 yr 1 hr	N-BC-A02	4.78
10 yr 1 hr	N-BD	1.59
10 yr 1 hr	N-BD-A01	3.33
10 yr 1 hr	N-BD-A02	3.36
10 yr 1 hr	N-BD-A02x	3.37
10 yr 1 hr	N-BD-A03	3.37
10 yr 1 hr	N-BD-A05	3.37
10 yr 1 hr	N-BD-B02	3.33
10 yr 1 hr	N-BD-B03	3.32
10 yr 1 hr	N-BD-B04	3.32
10 yr 1 hr	N-BD-B04x	3.32
10 yr 1 hr	N-BE	1.59
10 yr 1 hr	N-BE-A01	3.31
10 yr 1 hr	N-BE-A03	3.39
10 yr 1 hr	N-BE-A04	3.4
10 yr 1 hr	N-BF	1.59
10 yr 1 hr	N-BF-A01	3.9
10 yr 1 hr	N-CA	1.59
10 yr 1 hr	N-CA-A01c	5.81
10 yr 1 hr	N-CA-A01d	3.23
10 yr 1 hr	N-CA-A02	3.35
10 yr 1 hr	N-CA-A03	3.37
10 yr 1 hr	N-CA-A04	3.4
10 yr 1 hr	N-CA-A05	3.41

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Area South Existing Conditions (BCDE)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]
10 yr 1 hr	N-CA-A07	4.72
10 yr 1 hr	N-CA-B03	3.36
10 yr 1 hr	N-CA-B04	3.38
10 yr 1 hr	N-CA-B07	4.35
10 yr 1 hr	N-CA-C03	3.13
10 yr 1 hr	N-CA-C04	3.11
10 yr 1 hr	N-CA-C05	3.14
10 yr 1 hr	N-CA-D06	3.62
10 yr 1 hr	N-CA-D07	3.62
10 yr 1 hr	N-CA-D07x	3.79
10 yr 1 hr	N-CA-D08	3.13
10 yr 1 hr	N-CA-D08x	3.64
10 yr 1 hr	N-CA-D09x	3.13
10 yr 1 hr	N-CA-E07	4.42
10 yr 1 hr	N-CA-E08	4.43
10 yr 1 hr	N-CA-E09x	4.57
10 yr 1 hr	N-CA-F04	3.37
10 yr 1 hr	N-CA-F05	3.09
10 yr 1 hr	N-CA-F05x	3.19
10 yr 1 hr	N-CA-F06	3.08
10 yr 1 hr	N-CA-F06x	3.07
10 yr 1 hr	N-CA-F07	3.08
10 yr 1 hr	N-CA-F07x	3.07
10 yr 1 hr	N-CA-F08	3.09
10 yr 1 hr	N-CA-F09	3.09
10 yr 1 hr	N-CA-F09x	3.09
10 yr 1 hr	N-CA-F10	3.1
10 yr 1 hr	N-CA-F11	3.1
10 yr 1 hr	N-CA-F11x	3.09
10 yr 1 hr	N-CA-F12	3.1
10 yr 1 hr	N-CA-F12x	3.1
10 yr 1 hr	N-CA-G08	3.1
10 yr 1 hr	N-CA-G09	3.1
10 yr 1 hr	N-CA-G10	3.39
10 yr 1 hr	N-CA-G11x	3.37
10 yr 1 hr	N-CA-H09	3.1
10 yr 1 hr	N-CA-H10	3.1
10 yr 1 hr	N-CA-H10x	3.1
10 yr 1 hr	N-CA-H11	3.12
10 yr 1 hr	N-CA-H11x	3.1
10 yr 1 hr	N-CA-H12	3.12
10 yr 1 hr	N-CA-H13	3.24
10 yr 1 hr	N-CA-H14	3.32
10 yr 1 hr	N-CA-I12	3.12

Kimley»Horn

Area South Existing Conditions (BCDE)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]
10 yr 1 hr	N-CA-I13	3.12
10 yr 1 hr	N-CA-I14	3.12
10 yr 1 hr	N-CA-J14	3.26
10 yr 1 hr	N-CA-J15x	3.3
10 yr 1 hr	N-CA-K03	3.36
10 yr 1 hr	N-CA-L04	3.38
10 yr 1 hr	N-CA-L05	3.52
10 yr 1 hr	N-CA-M06	3.55
10 yr 1 hr	N-CA-N05	3.57
10 yr 1 hr	N-CA-O08	4.93
10 yr 1 hr	N-CA-S05	3.23
10 yr 1 hr	N-CA-T08	3.06
10 yr 1 hr	N-CA-T09	3.06
10 yr 1 hr	N-CB	1.59
10 yr 1 hr	N-CB-A01	3
10 yr 1 hr	N-CC	1.59
10 yr 1 hr	N-CC-A01	2.81
10 yr 1 hr	N-CC-A02	2.84
10 yr 1 hr	N-CC-A03	3.06
10 yr 1 hr	N-CE	1.59
10 yr 1 hr	N-CE-A01	3.1
10 yr 1 hr	N-CE-A02	3.1
10 yr 1 hr	N-CE-A03	3.1
10 yr 1 hr	N-CF	1.59
10 yr 1 hr	N-CF-A01	3.12
10 yr 1 hr	N-CF-A02	3.12
10 yr 1 hr	N-CF-A03x	3.12
10 yr 1 hr	N-CG	1.59
10 yr 1 hr	N-CG-A01	3.12
10 yr 1 hr	N-CG-A02x	3.12
10 yr 1 hr	N-CG-A03x	3.26
10 yr 1 hr	N-CH	1.59
10 yr 1 hr	N-CH-A01b	1.81
10 yr 1 hr	N-CH-A02	2.23
10 yr 1 hr	N-CH-A03	3.64
10 yr 1 hr	N-CH-A04	3.76
10 yr 1 hr	N-CH-B02	2.87
10 yr 1 hr	N-CH-B03	3.84
10 yr 1 hr	N-CH-B03x	2.89
10 yr 1 hr	N-CH-B04	3.91
10 yr 1 hr	N-CH-B04x	4.04
10 yr 1 hr	N-CH-B05	4.72
10 yr 1 hr	N-CH-B05x	3.99
10 yr 1 hr	N-CH-B06	4.88

Sim	Node Name	Existing Maximum Stage [ft]
10 yr 1 hr	N-CH-B06x	4.82
10 yr 1 hr	N-CH-B07	5.89
10 yr 1 hr	N-CH-C04	3.75
10 yr 1 hr	N-CH-C05	3.77
10 yr 1 hr	N-CH-C05x1	3.77
10 yr 1 hr	N-CH-C05x2	3.77
10 yr 1 hr	N-CH-C05x3	3.77
10 yr 1 hr	N-CH-C06	3.78
10 yr 1 hr	N-CH-C06x	3.77
10 yr 1 hr	N-CH-C07x	3.77
10 yr 1 hr	N-CH-D05	3.77
10 yr 1 hr	N-CH-D06	3.77
10 yr 1 hr	N-CH-D08x	3.77
10 yr 1 hr	N-CH-E06	3.78
10 yr 1 hr	N-CH-E07	3.78
10 yr 1 hr	N-CH-F07	3.78
10 yr 1 hr	N-CH-F08	3.78
10 yr 1 hr	N-CH-G07	3.77
10 yr 1 hr	N-CH-G08	3.77
10 yr 1 hr	N-CH-G09	3.77
10 yr 1 hr	N-CH-G10	3.77
10 yr 1 hr	N-CH-G11	3.77
10 yr 1 hr	N-CH-I04	3.73
10 yr 1 hr	N-CH-I05x1	3.76
10 yr 1 hr	N-CH-I05x2	3.76
10 yr 1 hr	N-CH-I05x3	3.76
10 yr 1 hr	N-CH-I05x4	3.76
10 yr 1 hr	N-CI	1.59
10 yr 1 hr	N-D10	3.77
10 yr 1 hr	N-D16	2.53
10 yr 1 hr	N-D19	4.78
10 yr 1 hr	N-D20	4.77
10 yr 1 hr	N-D22	4.79
10 yr 1 hr	N-D30	4.76
10 yr 1 hr	N-DA	1.59
10 yr 1 hr	N-DA-A01	3.36
10 yr 1 hr	N-DB	1.59
10 yr 1 hr	N-DC	1.59
10 yr 1 hr	N-DI-A01	3.51
10 yr 1 hr	N-DI-A02	3.52
10 yr 1 hr	N-DI-B04	4.27
10 yr 1 hr	N-DI-B05	4.03
10 yr 1 hr	N-DI-B05x	4.71
10 yr 1 hr	N-DI-B06	4.04

Sim	Node Name	Existing Maximum Stage [ft]
10 yr 1 hr	N-DI-B07	4.72
10 yr 1 hr	N-DI-B08	4.72
10 yr 1 hr	N-DI-B09	4.73
10 yr 1 hr	N-DI-B10	4.75
10 yr 1 hr	N-DI-B10x	4.73
10 yr 1 hr	N-DI-B11	4.74
10 yr 1 hr	N-DI-C03	3.55
10 yr 1 hr	N-DI-C04	4.78
10 yr 1 hr	N-DI-C05	4.52
10 yr 1 hr	N-DP	4.17
10 yr 1 hr	N-DP-A01	4.32
10 yr 1 hr	N-DP-A02	4.36
10 yr 1 hr	N-DP-A04	4.39
10 yr 1 hr	N-DP-A07	4.77
10 yr 1 hr	N-DP-A08	4.77
10 yr 1 hr	N-DP-A09	4.77
10 yr 1 hr	N-DP-A09x	4.77
10 yr 1 hr	N-DP-A10	4.76
10 yr 1 hr	N-DP-A11x	4.76
10 yr 1 hr	N-DP-B2	4.35
10 yr 1 hr	N-DP-C02	4.37
10 yr 1 hr	N-DP-C03	3.36
10 yr 1 hr	N-DP-C03x	4.37
10 yr 1 hr	N-DP-D02	4.43
10 yr 1 hr	N-DP-D03x	4.82
10 yr 1 hr	N-DP-D04	4.59
10 yr 1 hr	N-DP-D05x	4.64
10 yr 1 hr	N-DP-D05y	4.75
10 yr 1 hr	N-DP-D06x	4.71
10 yr 1 hr	N-DP-D06y	4.87
10 yr 1 hr	N-DP-D07x	4.81
10 yr 1 hr	N-DP-D07y	4.91
10 yr 1 hr	N-DP-D08x	4.89
10 yr 1 hr	N-DP-D08y	4.94
10 yr 1 hr	N-DP-D09	5.01
10 yr 1 hr	N-DP-D10	5.4
10 yr 1 hr	N-DP-E05	4.74
10 yr 1 hr	N-DP-E06	4.86
10 yr 1 hr	N-DP-E08	4.78
10 yr 1 hr	N-DP-F07	5.1
10 yr 1 hr	N-DP-F08	4.94
10 yr 1 hr	N-DP-F09	4.96
10 yr 1 hr	N-DP-G05	4.36
10 yr 1 hr	N-DP-G06	4.36
10 yr 1 hr	N-DP-G07	4.36

Sim	Node Name	Existing Maximum Stage [ft]
10 yr 1 hr	N-DP-G07x	4.35
10 yr 1 hr	N-DP-G08	4.39
10 yr 1 hr	N-DP-G08x	4.36
10 yr 1 hr	N-DP-H04	4.36
10 yr 1 hr	N-DP-H05	4.36
10 yr 1 hr	N-DP-H05x	4.36
10 yr 1 hr	N-DP-H06	4.35
10 yr 1 hr	N-DP-H06x	4.36
10 yr 1 hr	N-DP-K07	4.36
10 yr 1 hr	N-DP-M10	5.11
10 yr 1 hr	N-DP-M11	5.2
10 yr 1 hr	N-DP-M12	5.25
10 yr 1 hr	N-DP-N10	4.89
10 yr 1 hr	N-DP-O10	4.77
10 yr 1 hr	N-DP-O11	4.88
10 yr 1 hr	N-DP-P06	4.6
10 yr 1 hr	N-DP-Y03	5.11
10 yr 1 hr	N-DP-Z12	4.26
10 yr 1 hr	N-DQ-A01	4.33
10 yr 1 hr	N-DQ-A02	4.34
10 yr 1 hr	N-DQ-A03	4.33
10 yr 1 hr	N-DQ-A03x	2.94
10 yr 1 hr	N-DQ-A04	5.32
10 yr 1 hr	N-DQ-A05	4.03
10 yr 1 hr	N-DQ-A06	4.33
10 yr 1 hr	N-DQ-A07	4.33
10 yr 1 hr	N-DQ-A08	4.33
10 yr 1 hr	N-E01	2.9
10 yr 1 hr	N-E02	3.35
10 yr 1 hr	N-E03	4
10 yr 1 hr	N-E07	4.49
10 yr 1 hr	N-E08	3.78
10 yr 1 hr	N-E10	3.71
10 yr 1 hr	N-E11	1.83
10 yr 1 hr	N-EA	1.59
10 yr 1 hr	N-EA-A01	3.81
10 yr 1 hr	N-EA-A02	3.81
10 yr 1 hr	N-EB	1.59
10 yr 1 hr	N-EB-A01	2.52
10 yr 1 hr	N-EC	1.59
10 yr 1 hr	N-EC-A01	2.69
10 yr 1 hr	N-ED	1.59
10 yr 1 hr	N-ED-A01	3.24
10 yr 1 hr	N-ED-A02	3.41
10 yr 1 hr	N-ED-A03	3.51

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Area South Existing Conditions (BCDE)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]
10 yr 1 hr	N-EE	1.59
10 yr 1 hr	N-EE-A01	3.66
10 yr 1 hr	N-EF	1.59
10 yr 1 hr	N-EF-A01	3.11
10 yr 1 hr	N-EG	1.59
10 yr 1 hr	N-EG-A01	3.43
10 yr 1 hr	N-EG-A02	3.62
10 yr 1 hr	N-EH	1.59
10 yr 1 hr	N-EH-A01	1.77
10 yr 1 hr	N-EI	1.59
10 yr 1 hr	N-EJ	1.59
10 yr 1 hr	N-EJ-A01	1.61
10 yr 1 hr	N-EK	1.59
10 yr 1 hr	N-EK-A01	3.68
10 yr 1 hr	N-EL	1.59
10 yr 1 hr	N-EL-A01	3.01
10 yr 1 hr	N-EM	1.59
10 yr 1 hr	N-EM-A01	2.63
10 yr 1 hr	N-EM-A02	2.61
10 yr 1 hr	N-EM-A03	2
10 yr 1 hr	N-EN	1.59
10 yr 1 hr	N-EN-A01	2.83
10 yr 1 hr	N-EO	1.59
10 yr 1 hr	N-EO-A01	2.22
10 yr 1 hr	N-EP	1.59
10 yr 1 hr	N-EP-A01	1.98
10 yr 1 hr	N-EQ	1.59
10 yr 1 hr	N-EQ-A01	1.65
10 yr 1 hr	N-ER	1.59
10 yr 1 hr	N-ES	1.59
10 yr 1 hr	N-ET	1.59
10 yr 1 hr	N-ET-A01	1.59

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Sim	Node Name	Existing Maximum Stage [ft]
25 yr 72 hr	N-BA	1.59
25 yr 72 hr	N-BA-A01	3.55
25 yr 72 hr	N-BA-A02	3.6
25 yr 72 hr	N-BA-A03	3.64
25 yr 72 hr	N-BA-A03x	3.6
25 yr 72 hr	N-BA-A04	3.71
25 yr 72 hr	N-BA-A04x	3.63
25 yr 72 hr	N-BA-A05	3.72
25 yr 72 hr	N-BA-A06	3.78
25 yr 72 hr	N-BA-A07	3.82
25 yr 72 hr	N-BA-A07x	3.81
25 yr 72 hr	N-BA-A08	3.83
25 yr 72 hr	N-BA-A08x	3.82
25 yr 72 hr	N-BA-A09	4.01
25 yr 72 hr	N-BA-B02	3.41
25 yr 72 hr	N-BA-B03	3.41
25 yr 72 hr	N-BA-B04	3.39
25 yr 72 hr	N-BA-C03	3.57
25 yr 72 hr	N-BA-C04	3.57
25 yr 72 hr	N-BA-D05	3.73
25 yr 72 hr	N-BA-D06	3.75
25 yr 72 hr	N-BA-D07	3.85
25 yr 72 hr	N-BA-D08	3.89
25 yr 72 hr	N-BA-E09	3.83
25 yr 72 hr	N-BA-F09	3.88
25 yr 72 hr	N-BA-K04	3.69
25 yr 72 hr	N-BA-K05	3.72
25 yr 72 hr	N-BA-K06	3.78
25 yr 72 hr	N-BA-K08	5.08
25 yr 72 hr	N-BA-L06	3.76
25 yr 72 hr	N-BA-Q05	3.67
25 yr 72 hr	N-BA-Q06	3.66
25 yr 72 hr	N-BA-Q06x	3.67
25 yr 72 hr	N-BA-Q07	3.68
25 yr 72 hr	N-BA-Q07x	3.66
25 yr 72 hr	N-BA-Q08	3.68
25 yr 72 hr	N-BA-R06	3.69
25 yr 72 hr	N-BA-R07	3.68
25 yr 72 hr	N-BA-R07x	3.7
25 yr 72 hr	N-BA-R08	3.66
25 yr 72 hr	N-BA-R08x	3.68
25 yr 72 hr	N-BA-R09	3.67
25 yr 72 hr	N-BA-R10	3.67
25 yr 72 hr	N-BA-R11	3.65

Sim	Node Name	Existing Maximum Stage [ft]
25 yr 72 hr	N-BA-S06a	3.94
25 yr 72 hr	N-BA-T07	3.73
25 yr 72 hr	N-BA-T08	3.72
25 yr 72 hr	N-BA-T08x	3.73
25 yr 72 hr	N-BA-T09	3.69
25 yr 72 hr	N-BA-T09x	3.71
25 yr 72 hr	N-BA-T10	3.69
25 yr 72 hr	N-BA-U02	3.55
25 yr 72 hr	N-BA-U03	3.56
25 yr 72 hr	N-BA-V07	3.8
25 yr 72 hr	N-BA-W08	4.54
25 yr 72 hr	N-BA-W09A	4.55
25 yr 72 hr	N-BA-W09B	4.51
25 yr 72 hr	N-BB	1.59
25 yr 72 hr	N-BB-A01	3.6
25 yr 72 hr	N-BB-A02	3.59
25 yr 72 hr	N-BB-A03	3.57
25 yr 72 hr	N-BB-A04	3.58
25 yr 72 hr	N-BC	1.59
25 yr 72 hr	N-BC-A01	2.54
25 yr 72 hr	N-BC-A02	4.82
25 yr 72 hr	N-BD	1.59
25 yr 72 hr	N-BD-A01	3.59
25 yr 72 hr	N-BD-A02	3.64
25 yr 72 hr	N-BD-A02x	3.65
25 yr 72 hr	N-BD-A03	3.65
25 yr 72 hr	N-BD-A05	3.64
25 yr 72 hr	N-BD-B02	3.59
25 yr 72 hr	N-BD-B03	3.57
25 yr 72 hr	N-BD-B04	3.64
25 yr 72 hr	N-BD-B04x	3.57
25 yr 72 hr	N-BE	1.59
25 yr 72 hr	N-BE-A01	3.56
25 yr 72 hr	N-BE-A03	3.68
25 yr 72 hr	N-BE-A04	3.68
25 yr 72 hr	N-BF	1.59
25 yr 72 hr	N-BF-A01	4.06
25 yr 72 hr	N-CA	1.59
25 yr 72 hr	N-CA-A01c	5.81
25 yr 72 hr	N-CA-A01d	3.45
25 yr 72 hr	N-CA-A02	3.58
25 yr 72 hr	N-CA-A03	3.59
25 yr 72 hr	N-CA-A04	3.6
25 yr 72 hr	N-CA-A05	3.6

Sim	Node Name	Existing Maximum Stage [ft]
25 yr 72 hr	N-CA-A07	5.04
25 yr 72 hr	N-CA-B03	3.59
25 yr 72 hr	N-CA-B04	3.6
25 yr 72 hr	N-CA-B07	4.7
25 yr 72 hr	N-CA-C03	3.38
25 yr 72 hr	N-CA-C04	3.35
25 yr 72 hr	N-CA-C05	3.39
25 yr 72 hr	N-CA-D06	3.64
25 yr 72 hr	N-CA-D07	3.65
25 yr 72 hr	N-CA-D07x	3.81
25 yr 72 hr	N-CA-D08	3.4
25 yr 72 hr	N-CA-D08x	3.66
25 yr 72 hr	N-CA-D09x	3.4
25 yr 72 hr	N-CA-E07	4.8
25 yr 72 hr	N-CA-E08	4.82
25 yr 72 hr	N-CA-E09x	5.03
25 yr 72 hr	N-CA-F04	3.56
25 yr 72 hr	N-CA-F05	3.36
25 yr 72 hr	N-CA-F05x	3.43
25 yr 72 hr	N-CA-F06	3.35
25 yr 72 hr	N-CA-F06x	3.33
25 yr 72 hr	N-CA-F07	3.34
25 yr 72 hr	N-CA-F07x	3.33
25 yr 72 hr	N-CA-F08	3.36
25 yr 72 hr	N-CA-F09	3.36
25 yr 72 hr	N-CA-F09x	3.36
25 yr 72 hr	N-CA-F10	3.37
25 yr 72 hr	N-CA-F11	3.37
25 yr 72 hr	N-CA-F11x	3.37
25 yr 72 hr	N-CA-F12	3.37
25 yr 72 hr	N-CA-F12x	3.37
25 yr 72 hr	N-CA-G08	3.37
25 yr 72 hr	N-CA-G09	3.38
25 yr 72 hr	N-CA-G10	3.58
25 yr 72 hr	N-CA-G11x	3.56
25 yr 72 hr	N-CA-H09	3.38
25 yr 72 hr	N-CA-H10	3.38
25 yr 72 hr	N-CA-H10x	3.37
25 yr 72 hr	N-CA-H11	3.39
25 yr 72 hr	N-CA-H11x	3.38
25 yr 72 hr	N-CA-H12	3.39
25 yr 72 hr	N-CA-H13	3.4
25 yr 72 hr	N-CA-H14	3.41
25 yr 72 hr	N-CA-I12	3.39

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Sim	Node Name	Existing Maximum Stage [ft]
25 yr 72 hr	N-CA-I13	3.39
25 yr 72 hr	N-CA-I14	3.39
25 yr 72 hr	N-CA-J14	3.4
25 yr 72 hr	N-CA-J15x	3.4
25 yr 72 hr	N-CA-K03	3.62
25 yr 72 hr	N-CA-L04	3.6
25 yr 72 hr	N-CA-L05	3.73
25 yr 72 hr	N-CA-M06	3.77
25 yr 72 hr	N-CA-N05	3.66
25 yr 72 hr	N-CA-O08	4.98
25 yr 72 hr	N-CA-S05	3.41
25 yr 72 hr	N-CA-T08	3.32
25 yr 72 hr	N-CA-T09	3.32
25 yr 72 hr	N-CB	1.59
25 yr 72 hr	N-CB-A01	3.19
25 yr 72 hr	N-CC	1.59
25 yr 72 hr	N-CC-A01	3.15
25 yr 72 hr	N-CC-A02	3.18
25 yr 72 hr	N-CC-A03	3.31
25 yr 72 hr	N-CE	1.59
25 yr 72 hr	N-CE-A01	3.37
25 yr 72 hr	N-CE-A02	3.37
25 yr 72 hr	N-CE-A03	3.37
25 yr 72 hr	N-CF	1.59
25 yr 72 hr	N-CF-A01	3.38
25 yr 72 hr	N-CF-A02	3.38
25 yr 72 hr	N-CF-A03x	3.38
25 yr 72 hr	N-CG	1.59
25 yr 72 hr	N-CG-A01	3.38
25 yr 72 hr	N-CG-A02x	3.39
25 yr 72 hr	N-CG-A03x	3.39
25 yr 72 hr	N-CH	1.59
25 yr 72 hr	N-CH-A01b	1.88
25 yr 72 hr	N-CH-A02	2.75
25 yr 72 hr	N-CH-A03	3.93
25 yr 72 hr	N-CH-A04	4.03
25 yr 72 hr	N-CH-B02	2.96
25 yr 72 hr	N-CH-B03	3.9
25 yr 72 hr	N-CH-B03x	3.08
25 yr 72 hr	N-CH-B04	3.94
25 yr 72 hr	N-CH-B04x	4.12
25 yr 72 hr	N-CH-B05	4.75
25 yr 72 hr	N-CH-B05x	4.05
25 yr 72 hr	N-CH-B06	4.88

Kimley»Horn

Area South Existing Conditions (BCDE)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]
25 yr 72 hr	N-CH-B06x	4.83
25 yr 72 hr	N-CH-B07	5.93
25 yr 72 hr	N-CH-C04	4.02
25 yr 72 hr	N-CH-C05	4.04
25 yr 72 hr	N-CH-C05x1	4.03
25 yr 72 hr	N-CH-C05x2	4.03
25 yr 72 hr	N-CH-C05x3	4.03
25 yr 72 hr	N-CH-C06	4.04
25 yr 72 hr	N-CH-C06x	4.04
25 yr 72 hr	N-CH-C07x	4.04
25 yr 72 hr	N-CH-D05	4.03
25 yr 72 hr	N-CH-D06	4.03
25 yr 72 hr	N-CH-D08x	4.04
25 yr 72 hr	N-CH-E06	4.04
25 yr 72 hr	N-CH-E07	4.04
25 yr 72 hr	N-CH-F07	4.05
25 yr 72 hr	N-CH-F08	4.05
25 yr 72 hr	N-CH-G07	4.03
25 yr 72 hr	N-CH-G08	4.03
25 yr 72 hr	N-CH-G09	4.02
25 yr 72 hr	N-CH-G10	4.02
25 yr 72 hr	N-CH-G11	4.03
25 yr 72 hr	N-CH-I04	3.99
25 yr 72 hr	N-CH-I05x1	4.02
25 yr 72 hr	N-CH-I05x2	4.01
25 yr 72 hr	N-CH-I05x3	4.01
25 yr 72 hr	N-CH-I05x4	4.02
25 yr 72 hr	N-CI	1.59
25 yr 72 hr	N-D10	4.03
25 yr 72 hr	N-D16	2.55
25 yr 72 hr	N-D19	4.89
25 yr 72 hr	N-D20	4.89
25 yr 72 hr	N-D22	4.86
25 yr 72 hr	N-D30	4.87
25 yr 72 hr	N-DA	1.59
25 yr 72 hr	N-DA-A01	3.76
25 yr 72 hr	N-DB	1.59
25 yr 72 hr	N-DC	1.59
25 yr 72 hr	N-DI-A01	3.98
25 yr 72 hr	N-DI-A02	4.02
25 yr 72 hr	N-DI-B04	4.51
25 yr 72 hr	N-DI-B05	4.32
25 yr 72 hr	N-DI-B05x	4.83
25 yr 72 hr	N-DI-B06	4.33

Sim	Node Name	Existing Maximum Stage [ft]
25 yr 72 hr	N-DI-B07	4.83
25 yr 72 hr	N-DI-B08	4.83
25 yr 72 hr	N-DI-B09	4.85
25 yr 72 hr	N-DI-B10	4.87
25 yr 72 hr	N-DI-B10x	4.85
25 yr 72 hr	N-DI-B11	4.86
25 yr 72 hr	N-DI-C03	4.09
25 yr 72 hr	N-DI-C04	4.86
25 yr 72 hr	N-DI-C05	4.76
25 yr 72 hr	N-DP	4.39
25 yr 72 hr	N-DP-A01	4.54
25 yr 72 hr	N-DP-A02	4.59
25 yr 72 hr	N-DP-A04	4.62
25 yr 72 hr	N-DP-A07	4.89
25 yr 72 hr	N-DP-A08	4.89
25 yr 72 hr	N-DP-A09	4.88
25 yr 72 hr	N-DP-A09x	4.89
25 yr 72 hr	N-DP-A10	4.88
25 yr 72 hr	N-DP-A11x	4.88
25 yr 72 hr	N-DP-B2	4.57
25 yr 72 hr	N-DP-C02	4.59
25 yr 72 hr	N-DP-C03	3.76
25 yr 72 hr	N-DP-C03x	4.59
25 yr 72 hr	N-DP-D02	4.64
25 yr 72 hr	N-DP-D03x	4.87
25 yr 72 hr	N-DP-D04	4.85
25 yr 72 hr	N-DP-D05x	4.88
25 yr 72 hr	N-DP-D05y	4.9
25 yr 72 hr	N-DP-D06x	4.94
25 yr 72 hr	N-DP-D06y	5.03
25 yr 72 hr	N-DP-D07x	5.03
25 yr 72 hr	N-DP-D07y	5.09
25 yr 72 hr	N-DP-D08x	5.1
25 yr 72 hr	N-DP-D08y	5.13
25 yr 72 hr	N-DP-D09	5.19
25 yr 72 hr	N-DP-D10	5.55
25 yr 72 hr	N-DP-E05	4.89
25 yr 72 hr	N-DP-E06	4.92
25 yr 72 hr	N-DP-E08	4.89
25 yr 72 hr	N-DP-F07	5.89
25 yr 72 hr	N-DP-F08	5.13
25 yr 72 hr	N-DP-F09	5.37
25 yr 72 hr	N-DP-G05	4.58
25 yr 72 hr	N-DP-G06	4.58
25 yr 72 hr	N-DP-G07	4.58

Sim	Node Name	Existing Maximum Stage [ft]
25 yr 72 hr	N-DP-G07x	4.57
25 yr 72 hr	N-DP-G08	4.62
25 yr 72 hr	N-DP-G08x	4.58
25 yr 72 hr	N-DP-H04	4.58
25 yr 72 hr	N-DP-H05	4.58
25 yr 72 hr	N-DP-H05x	4.58
25 yr 72 hr	N-DP-H06	4.57
25 yr 72 hr	N-DP-H06x	4.58
25 yr 72 hr	N-DP-K07	4.58
25 yr 72 hr	N-DP-M10	5.26
25 yr 72 hr	N-DP-M11	5.31
25 yr 72 hr	N-DP-M12	5.38
25 yr 72 hr	N-DP-N10	5.12
25 yr 72 hr	N-DP-O10	4.88
25 yr 72 hr	N-DP-O11	4.89
25 yr 72 hr	N-DP-P06	4.64
25 yr 72 hr	N-DP-Y03	5.12
25 yr 72 hr	N-DP-Z12	4.4
25 yr 72 hr	N-DQ-A01	4.55
25 yr 72 hr	N-DQ-A02	4.56
25 yr 72 hr	N-DQ-A03	4.55
25 yr 72 hr	N-DQ-A03x	3.13
25 yr 72 hr	N-DQ-A04	5.57
25 yr 72 hr	N-DQ-A05	4.36
25 yr 72 hr	N-DQ-A06	4.55
25 yr 72 hr	N-DQ-A07	4.55
25 yr 72 hr	N-DQ-A08	4.55
25 yr 72 hr	N-E01	2.93
25 yr 72 hr	N-E02	3.39
25 yr 72 hr	N-E03	4.02
25 yr 72 hr	N-E07	4.54
25 yr 72 hr	N-E08	3.82
25 yr 72 hr	N-E10	3.74
25 yr 72 hr	N-E11	2.57
25 yr 72 hr	N-EA	1.59
25 yr 72 hr	N-EA-A01	3.86
25 yr 72 hr	N-EA-A02	3.86
25 yr 72 hr	N-EB	1.59
25 yr 72 hr	N-EB-A01	3.03
25 yr 72 hr	N-EC	1.59
25 yr 72 hr	N-EC-A01	3.11
25 yr 72 hr	N-ED	1.59
25 yr 72 hr	N-ED-A01	3.63
25 yr 72 hr	N-ED-A02	3.64
25 yr 72 hr	N-ED-A03	3.64

Sim	Node Name	Existing Maximum Stage [ft]
25 yr 72 hr	N-EE	1.59
25 yr 72 hr	N-EE-A01	3.71
25 yr 72 hr	N-EF	1.59
25 yr 72 hr	N-EF-A01	3.71
25 yr 72 hr	N-EG	1.59
25 yr 72 hr	N-EG-A01	3.46
25 yr 72 hr	N-EG-A02	3.66
25 yr 72 hr	N-EH	1.59
25 yr 72 hr	N-EH-A01	2.02
25 yr 72 hr	N-EI	1.59
25 yr 72 hr	N-EJ	1.59
25 yr 72 hr	N-EJ-A01	1.65
25 yr 72 hr	N-EK	1.59
25 yr 72 hr	N-EK-A01	3.76
25 yr 72 hr	N-EL	1.59
25 yr 72 hr	N-EL-A01	3.04
25 yr 72 hr	N-EM	1.59
25 yr 72 hr	N-EM-A01	2.83
25 yr 72 hr	N-EM-A02	2.74
25 yr 72 hr	N-EM-A03	2.57
25 yr 72 hr	N-EN	1.59
25 yr 72 hr	N-EN-A01	2.92
25 yr 72 hr	N-EO	1.59
25 yr 72 hr	N-EO-A01	2.46
25 yr 72 hr	N-EP	1.59
25 yr 72 hr	N-EP-A01	2.56
25 yr 72 hr	N-EQ	1.59
25 yr 72 hr	N-EQ-A01	1.67
25 yr 72 hr	N-ER	1.59
25 yr 72 hr	N-ES	1.59
25 yr 72 hr	N-ET	1.59
25 yr 72 hr	N-ET-A01	1.6

Improvement Alternatives

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	Added-Junction-1	#N/A	5.83	#N/A
10 YR 1 HR	N-ABA	1.59	1.59	0
10 YR 1 HR	N-ABA-A01	3.66	1.79	-1.87
10 YR 1 HR	N-ABA-A02	3.83	1.82	-2.01
10 YR 1 HR	N-ABB	1.59	1.59	0
10 YR 1 HR	N-ABB-A01	3.57	1.73	-1.84
10 YR 1 HR	N-ABB-A02	4.23	1.9	-2.33
10 YR 1 HR	N-ABB-A03	4.23	1.99	-2.24
10 YR 1 HR	N-ABB-A04	4.23	2.04	-2.19
10 YR 1 HR	N-ABB-B02	4.25	1.76	-2.49
10 YR 1 HR	N-ABB-B03	4.27	1.89	-2.38
10 YR 1 HR	N-ABB-B03x	4.28	1.77	-2.51
10 YR 1 HR	N-ABB-B04	4.28	1.93	-2.35
10 YR 1 HR	N-ABC	1.59	1.59	0
10 YR 1 HR	N-ABC-A01	4.21	2.05	-2.16
10 YR 1 HR	N-ABC-A02	4.22	2.16	-2.06
10 YR 1 HR	N-ABC-B02	4.21	2.1	-2.11
10 YR 1 HR	N-ABD	1.59	1.59	0
10 YR 1 HR	N-ABD-A01	3.33	2.29	-1.04
10 YR 1 HR	N-ABD-A02	4.06	2.72	-1.34
10 YR 1 HR	N-ABD-A02x	3.76	2.38	-1.38
10 YR 1 HR	N-ABD-A03	4.64	3.26	-1.38
10 YR 1 HR	N-ABD-A03x	4.11	2.93	-1.18
10 YR 1 HR	N-ABD-A04	4.95	3.34	-1.61
10 YR 1 HR	N-ABD-A05	5.18	3.94	-1.24
10 YR 1 HR	N-ABD-A06	5.19	4.35	-0.84
10 YR 1 HR	N-ABD-A07	5.19	4.38	-0.81
10 YR 1 HR	N-ABD-B04	5.43	3.56	-1.87
10 YR 1 HR	N-ABD-B05	5.52	3.72	-1.8
10 YR 1 HR	N-ABD-B05x	5.43	3.57	-1.86
10 YR 1 HR	N-ABD-B06	5.53	3.76	-1.77
10 YR 1 HR	N-ABD-B07	6.17	4.49	-1.68
10 YR 1 HR	N-ABD-B08	7.41	7.41	0
10 YR 1 HR	N-ABE	1.59	1.59	0
10 YR 1 HR	N-ABE-A01	2.05	2.05	0
10 YR 1 HR	N-ABE-A02	2.68	2.68	0
10 YR 1 HR	N-ABF	1.59	1.59	0
10 YR 1 HR	N-ABF-A01	4.11	1.97	-2.14
10 YR 1 HR	N-ABF-A02	4.11	1.99	-2.12
10 YR 1 HR	N-ABG	1.59	1.59	0
10 YR 1 HR	N-ABG-A01	4.53	2.38	-2.15
10 YR 1 HR	N-ABG-A02	4.76	4.12	-0.64
10 YR 1 HR	N-ABG-A03	4.79	4.54	-0.25
10 YR 1 HR	N-ABH	1.59	1.59	0

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Area A Improvement Projects Selected Alternative (1A)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ABH-A01	4.07	1.66	-2.41
10 YR 1 HR	N-ABH-A02	4.98	1.64	-3.34
10 YR 1 HR	N-ABH-A03	4.98	3.32	-1.66
10 YR 1 HR	N-ABH-A03x	4.98	3.22	-1.76
10 YR 1 HR	N-ABH-B02	5.02	3.98	-1.04
10 YR 1 HR	N-ABH-B03	5.03	4.03	-1
10 YR 1 HR	N-ABH-B03x	5.03	4.19	-0.84
10 YR 1 HR	N-ABH-B04	5.04	4.05	-0.99
10 YR 1 HR	N-ABI	1.59	1.59	0
10 YR 1 HR	N-ABI-A01	4.93	1.84	-3.09
10 YR 1 HR	N-ABI-A02	4.93	3.57	-1.36
10 YR 1 HR	N-ABJ	1.59	1.59	0
10 YR 1 HR	N-ABJ-A01	4.95	1.85	-3.1
10 YR 1 HR	N-ABJ-A02	4.95	3.18	-1.77
10 YR 1 HR	N-ABK	1.59	1.59	0
10 YR 1 HR	N-ABK-A01	3.71	4.17	0.46
10 YR 1 HR	N-ABK-A02x1	5.66	5.62	-0.04
10 YR 1 HR	N-ABK-A02x2	5.67	5.64	-0.03
10 YR 1 HR	N-ABK-B02	4.99	4.18	-0.81
10 YR 1 HR	N-ABK-B03	4.99	4.18	-0.81
10 YR 1 HR	N-ABK-B04	7.48	5.69	-1.79
10 YR 1 HR	N-ABL	1.59	1.59	0
10 YR 1 HR	N-ABL-A01	3.41	3.24	-0.17
10 YR 1 HR	N-ABL-A02	4.33	4.29	-0.04
10 YR 1 HR	N-ABM	1.59	1.59	0
10 YR 1 HR	N-ABM-A01	4.74	2.13	-2.61
10 YR 1 HR	N-ABM-A02	4.74	3.9	-0.84
10 YR 1 HR	N-ABN	1.59	1.59	0
10 YR 1 HR	N-ABN-A01	9.68	9.5	-0.18
10 YR 1 HR	N-ABO	1.59	1.59	0
10 YR 1 HR	N-ABO-A01	3.81	2.97	-0.84
10 YR 1 HR	N-ABO-A02	5.2	5.47	0.27
10 YR 1 HR	N-ABP	1.59	1.59	0
10 YR 1 HR	N-ABQ	1.59	1.59	0
10 YR 1 HR	N-ADA-A01	6.1	5.67	-0.43
10 YR 1 HR	N-ADA-A02	6.92	5.77	-1.15
10 YR 1 HR	N-ADA-A03	6.93	5.83	-1.1
10 YR 1 HR	N-ADA-A03x	6.92	5.78	-1.14
10 YR 1 HR	N-ADA-A04	6.94	5.87	-1.07
10 YR 1 HR	N-ADA-A05	6.94	5.88	-1.06
10 YR 1 HR	N-ADA-B02	6.57	5.68	-0.89
10 YR 1 HR	N-ADA-B03	6.57	5.68	-0.89
10 YR 1 HR	N-ADA-B03x	6.57	5.68	-0.89
10 YR 1 HR	N-ADA-B04	7.22	5.68	-1.54

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Area A Improvement Projects Selected Alternative (1A)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADB-08	7.07	7.06	-0.01
10 YR 1 HR	N-ADB-A01	7.3	5.73	-1.57
10 YR 1 HR	N-ADB-A02	7.48	5.76	-1.72
10 YR 1 HR	N-ADB-A03	8.47	5.78	-2.69
10 YR 1 HR	N-ADB-A04	8.84	5.78	-3.06
10 YR 1 HR	N-ADB-A04x	8.76	5.78	-2.98
10 YR 1 HR	N-ADB-B03	7.49	5.92	-1.57
10 YR 1 HR	N-ADB-B04	8.83	6.36	-2.47
10 YR 1 HR	N-ADB-B05	8.86	7.98	-0.88
10 YR 1 HR	N-ADB-B06	9.16	9.08	-0.08
10 YR 1 HR	N-ADB-B07	9.7	9.52	-0.18
10 YR 1 HR	N-ADB-B07x	9.66	9.5	-0.16
10 YR 1 HR	N-ADC-A01	7.96	5.63	-2.33
10 YR 1 HR	N-ADC-A02	7.97	5.63	-2.34
10 YR 1 HR	N-Add-01	#N/A	1.59	#N/A
10 YR 1 HR	N-Add-02	#N/A	1.59	#N/A
10 YR 1 HR	N-ADD-A01	7.8	6.84	-0.96
10 YR 1 HR	N-ADD-A02	7.93	7.07	-0.86
10 YR 1 HR	N-ADD-A03	10.93	8.53	-2.4
10 YR 1 HR	N-ADD-A04	10.93	8.94	-1.99
10 YR 1 HR	N-ADD-A04x	10.93	8.53	-2.4
10 YR 1 HR	N-ADD-A05	10.98	9.57	-1.41
10 YR 1 HR	N-ADD-A06	10.99	10.2	-0.79
10 YR 1 HR	N-ADD-A07	12.51	11.1	-1.41
10 YR 1 HR	N-ADD-A08	12.53	11.46	-1.07
10 YR 1 HR	N-ADD-A09	12.59	11.73	-0.86
10 YR 1 HR	N-ADD-A10	12.59	12	-0.59
10 YR 1 HR	N-ADD-A11	12.64	12.3	-0.34
10 YR 1 HR	N-ADD-A12	13.08	12.62	-0.46
10 YR 1 HR	N-ADD-A13	13.36	13.02	-0.34
10 YR 1 HR	N-ADD-A14	13.37	13.04	-0.33
10 YR 1 HR	N-ADD-A15	13.35	13.02	-0.33
10 YR 1 HR	N-ADD-A16	13.25	13.01	-0.24
10 YR 1 HR	N-ADD-B03	7.95	7.1	-0.85
10 YR 1 HR	N-ADD-B05	11.67	11.67	0
10 YR 1 HR	N-ADD-C04	10.94	10.66	-0.28
10 YR 1 HR	N-ADD-C05	11.24	11.24	0
10 YR 1 HR	N-ADD-D08	12.01	11.39	-0.62
10 YR 1 HR	N-ADD-D09	11.87	11.72	-0.15
10 YR 1 HR	N-ADD-H04	10.93	10.42	-0.51
10 YR 1 HR	N-ADD-N13	12.88	12.63	-0.25
10 YR 1 HR	N-ADD-N14	13.15	12.73	-0.42
10 YR 1 HR	N-ADD-N15	12.55	12.69	0.14
10 YR 1 HR	N-ADE-A01	6.96	5.94	-1.02

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADE-A02	8.4	6.43	-1.97
10 YR 1 HR	N-ADE-A03	8.68	6.77	-1.91
10 YR 1 HR	N-ADE-A04	9.1	8.15	-0.95
10 YR 1 HR	N-ADE-A04x	8.7	6.77	-1.93
10 YR 1 HR	N-ADE-A05	10.84	10.84	0
10 YR 1 HR	N-ADE-A05x	9.1	8.17	-0.93
10 YR 1 HR	N-ADE-A06	11.2	11.2	0
10 YR 1 HR	N-ADE-B02	7.01	6	-1.01
10 YR 1 HR	N-ADE-B03	7.02	6	-1.02
10 YR 1 HR	N-ADE-C02	7.52	6.03	-1.49
10 YR 1 HR	N-ADE-C03	7.54	6.13	-1.41
10 YR 1 HR	N-ADE-D03	7	6.01	-0.99
10 YR 1 HR	N-ADS-A01	5.67	5.7	0.03
10 YR 1 HR	N-ADS-A02	5.99	5.72	-0.27
10 YR 1 HR	N-ASA-A01	5.41	5.46	0.05
10 YR 1 HR	N-ASA-A02	5.41	5.47	0.06
10 YR 1 HR	N-ASA-A03	5.61	5.47	-0.14
10 YR 1 HR	N-ASA-A04	5.72	5.47	-0.25
10 YR 1 HR	N-ASA-A05	5.89	5.48	-0.41
10 YR 1 HR	N-ASA-A06	6.09	5.48	-0.61
10 YR 1 HR	N-ASA-A07	6.12	5.48	-0.64
10 YR 1 HR	N-ASB-A01	5.55	5.47	-0.08
10 YR 1 HR	N-ASB-A02	5.55	5.47	-0.08
10 YR 1 HR	N-ASB-B02	5.8	5.49	-0.31
10 YR 1 HR	N-ASC-A01	5.32	5.55	0.23
10 YR 1 HR	N-ASC-A02	5.99	5.71	-0.28
10 YR 1 HR	N-ASC-A03	6.24	5.73	-0.51
10 YR 1 HR	N-ASC-A04	6.5	5.75	-0.75
10 YR 1 HR	N-ASC-B02	5.61	5.55	-0.06
10 YR 1 HR	N-ASC-B03	5.65	5.56	-0.09
10 YR 1 HR	N-ASD-A01a	5.82	6.05	0.23
10 YR 1 HR	N-ASD-A02	8.07	8.15	0.08
10 YR 1 HR	N-ASD-A03	8.89	8.93	0.04
10 YR 1 HR	N-ASD-A04	9.95	9.96	0.01
10 YR 1 HR	N-ASD-A05	10.3	10.29	-0.01
10 YR 1 HR	N-ASD-A06	10.99	10.97	-0.02
10 YR 1 HR	N-ASD-A07	11.55	11.53	-0.02
10 YR 1 HR	N-ASD-A08	12.21	12.19	-0.02
10 YR 1 HR	N-ASD-A09	13.04	13.02	-0.02
10 YR 1 HR	N-ASD-A11	14.02	14	-0.02
10 YR 1 HR	N-ASD-A12	14.91	14.89	-0.02
10 YR 1 HR	N-ASD-A13	15.49	15.47	-0.02
10 YR 1 HR	N-ASD-A14	15.82	15.8	-0.02
10 YR 1 HR	N-ASD-A15	16.4	16.4	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASD-A16	14.3	14.3	0
10 YR 1 HR	N-ASD-A17	16.61	16.61	0
10 YR 1 HR	N-ASD-A18	15.58	15.58	0
10 YR 1 HR	N-ASD-A19	14.92	14.92	0
10 YR 1 HR	N-ASD-B02	5.9	6.1	0.2
10 YR 1 HR	N-ASD-B03	7.08	7.15	0.07
10 YR 1 HR	N-ASD-B04	7.52	7.56	0.04
10 YR 1 HR	N-ASD-B05	8.63	8.63	0
10 YR 1 HR	N-ASD-C03	6.06	6.16	0.1
10 YR 1 HR	N-ASD-C04	6.08	6.12	0.04
10 YR 1 HR	N-ASD-D04	7.85	7.87	0.02
10 YR 1 HR	N-ASD-D05	8.43	8.43	0
10 YR 1 HR	N-ASD-D06	8.14	8.14	0
10 YR 1 HR	N-ASD-D07	8.49	8.49	0
10 YR 1 HR	N-ASD-E04	9.39	9.41	0.02
10 YR 1 HR	N-ASD-E05	10.23	10.23	0
10 YR 1 HR	N-ASD-E06	10.4	10.39	-0.01
10 YR 1 HR	N-ASD-E09	14.14	14.13	-0.01
10 YR 1 HR	N-ASD-E10	13.84	13.82	-0.02
10 YR 1 HR	N-ASD-F03	8.62	8.65	0.03
10 YR 1 HR	N-ASD-F04	9.24	9.24	0
10 YR 1 HR	N-ASD-F05	9.67	9.66	-0.01
10 YR 1 HR	N-ASD-G04	8.9	8.94	0.04
10 YR 1 HR	N-ASD-H07	9.29	9.29	0
10 YR 1 HR	N-ASD-H08	9.42	9.42	0
10 YR 1 HR	N-ASD-I09	10.85	10.85	0
10 YR 1 HR	N-ASD-J10	12.51	12.51	0
10 YR 1 HR	N-ASD-K10	13.86	13.85	-0.01
10 YR 1 HR	N-ASD-L07	10.46	10.4	-0.06
10 YR 1 HR	N-ASD-Q06	10.32	10.31	-0.01
10 YR 1 HR	N-ASD-Q08	11.23	11.21	-0.02
10 YR 1 HR	N-ASD-Q09	12.64	12.63	-0.01
10 YR 1 HR	N-ASD-R13	14.22	14.22	0
10 YR 1 HR	N-ASD-S13	14.84	14.84	0
10 YR 1 HR	N-ASD-T15	16.56	16.56	0
10 YR 1 HR	N-ASD-U06	10.26	10.25	-0.01
10 YR 1 HR	N-ASE-A01	5.62	5.83	0.21
10 YR 1 HR	N-ASE-A02	5.82	6.04	0.22
10 YR 1 HR	N-ASE-A03	7.99	6.3	-1.69
10 YR 1 HR	N-ASE-A04	7.99	6.35	-1.64
10 YR 1 HR	N-ASE-A05	11.37	11.37	0
10 YR 1 HR	N-ASE-B02	5.67	5.83	0.16
10 YR 1 HR	N-ASE-C03	6.14	6.78	0.64
10 YR 1 HR	N-ASE-D03	6.79	7.93	1.14

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Area A Improvement Projects Selected Alternative (1A)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASF-A01	6.28	5.48	-0.8
10 YR 1 HR	N-ASF-A02	6.28	5.48	-0.8
10 YR 1 HR	N-ASG-A01	5.69	5.52	-0.17
10 YR 1 HR	N-ASG-A02	6.03	5.56	-0.47
10 YR 1 HR	N-ASG-A03	6.51	5.57	-0.94
10 YR 1 HR	N-ASG-A04	7.03	5.6	-1.43
10 YR 1 HR	N-ASG-A05	7.03	5.61	-1.42
10 YR 1 HR	N-ASG-A06	7.11	7.11	0
10 YR 1 HR	N-ASG-B02	5.72	5.53	-0.19
10 YR 1 HR	N-ASG-B03x	5.72	5.53	-0.19
10 YR 1 HR	N-ASG-C04	6.42	5.59	-0.83
10 YR 1 HR	N-ASG-C05	6.4	5.59	-0.81
10 YR 1 HR	N-ASH-A01	5.56	5.5	-0.06
10 YR 1 HR	N-ASH-A02	5.65	5.65	0
10 YR 1 HR	N-ASI-A01	5.43	5.46	0.03
10 YR 1 HR	N-ASJ	1.59	1.59	0
10 YR 1 HR	N-ASJ-A01	5.69	5.69	0
10 YR 1 HR	N-ASK-A01	5.42	5.5	0.08

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	Added-Junction-1	#N/A	6.57	#N/A
25 YR 72 HR	N-ABA	1.59	1.59	0
25 YR 72 HR	N-ABA-A01	4.85	1.91	-2.94
25 YR 72 HR	N-ABA-A02	4.85	1.96	-2.89
25 YR 72 HR	N-ABB	1.59	1.59	0
25 YR 72 HR	N-ABB-A01	4.04	2.06	-1.98
25 YR 72 HR	N-ABB-A02	4.87	2.11	-2.76
25 YR 72 HR	N-ABB-A03	4.88	2.26	-2.62
25 YR 72 HR	N-ABB-A04	4.88	2.34	-2.54
25 YR 72 HR	N-ABB-B02	4.87	2.4	-2.47
25 YR 72 HR	N-ABB-B03	4.87	3.44	-1.43
25 YR 72 HR	N-ABB-B03x	4.87	2.4	-2.47
25 YR 72 HR	N-ABB-B04	4.87	3.45	-1.42
25 YR 72 HR	N-ABC	1.59	1.59	0
25 YR 72 HR	N-ABC-A01	4.89	2.33	-2.56
25 YR 72 HR	N-ABC-A02	4.89	2.53	-2.36
25 YR 72 HR	N-ABC-B02	4.89	2.41	-2.48
25 YR 72 HR	N-ABD	1.59	1.59	0
25 YR 72 HR	N-ABD-A01	4.91	2.68	-2.23
25 YR 72 HR	N-ABD-A02	4.92	3.33	-1.59
25 YR 72 HR	N-ABD-A02x	4.92	2.82	-2.1
25 YR 72 HR	N-ABD-A03	5.22	4.13	-1.09
25 YR 72 HR	N-ABD-A03x	4.93	3.7	-1.23
25 YR 72 HR	N-ABD-A04	5.6	4.23	-1.37
25 YR 72 HR	N-ABD-A05	5.66	4.84	-0.82
25 YR 72 HR	N-ABD-A06	5.28	4.98	-0.3
25 YR 72 HR	N-ABD-A07	5.28	4.98	-0.3
25 YR 72 HR	N-ABD-B04	5.73	4.63	-1.1
25 YR 72 HR	N-ABD-B05	5.74	4.89	-0.85
25 YR 72 HR	N-ABD-B05x	5.72	4.65	-1.07
25 YR 72 HR	N-ABD-B06	5.74	4.96	-0.78
25 YR 72 HR	N-ABD-B07	6.82	6.13	-0.69
25 YR 72 HR	N-ABD-B08	7.49	7.49	0
25 YR 72 HR	N-ABE	1.59	1.59	0
25 YR 72 HR	N-ABE-A01	4.89	2.32	-2.57
25 YR 72 HR	N-ABE-A02	4.89	3.33	-1.56
25 YR 72 HR	N-ABF	1.59	1.59	0
25 YR 72 HR	N-ABF-A01	4.88	2.2	-2.68
25 YR 72 HR	N-ABF-A02	4.89	2.24	-2.65
25 YR 72 HR	N-ABG	1.59	1.59	0
25 YR 72 HR	N-ABG-A01	5.04	2.89	-2.15
25 YR 72 HR	N-ABG-A02	5.04	4.55	-0.49
25 YR 72 HR	N-ABG-A03	5.05	4.64	-0.41
25 YR 72 HR	N-ABH	1.59	1.59	0

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Area A Improvement Projects Selected Alternative (1A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ABH-A01	4.6	1.87	-2.73
25 YR 72 HR	N-ABH-A02	5.53	1.85	-3.68
25 YR 72 HR	N-ABH-A03	5.53	3.44	-2.09
25 YR 72 HR	N-ABH-A03x	5.53	4.57	-0.96
25 YR 72 HR	N-ABH-B02	5.57	4.96	-0.61
25 YR 72 HR	N-ABH-B03	5.58	4.99	-0.59
25 YR 72 HR	N-ABH-B03x	5.59	4.97	-0.62
25 YR 72 HR	N-ABH-B04	5.59	5	-0.59
25 YR 72 HR	N-ABI	1.59	1.59	0
25 YR 72 HR	N-ABI-A01	5.52	1.98	-3.54
25 YR 72 HR	N-ABI-A02	5.52	3.68	-1.84
25 YR 72 HR	N-ABJ	1.59	1.59	0
25 YR 72 HR	N-ABJ-A01	5.52	1.99	-3.53
25 YR 72 HR	N-ABJ-A02	5.52	3.28	-2.24
25 YR 72 HR	N-ABK	1.59	1.59	0
25 YR 72 HR	N-ABK-A01	4.39	4.94	0.55
25 YR 72 HR	N-ABK-A02x1	6.85	6.73	-0.12
25 YR 72 HR	N-ABK-A02x2	6.86	6.75	-0.11
25 YR 72 HR	N-ABK-B02	5.47	4.94	-0.53
25 YR 72 HR	N-ABK-B03	5.47	4.94	-0.53
25 YR 72 HR	N-ABK-B04	7.51	6.61	-0.9
25 YR 72 HR	N-ABL	1.59	1.59	0
25 YR 72 HR	N-ABL-A01	5.23	4.06	-1.17
25 YR 72 HR	N-ABL-A02	5.22	4.41	-0.81
25 YR 72 HR	N-ABM	1.59	1.59	0
25 YR 72 HR	N-ABM-A01	5.22	2.47	-2.75
25 YR 72 HR	N-ABM-A02	5.22	4.08	-1.14
25 YR 72 HR	N-ABN	1.59	1.59	0
25 YR 72 HR	N-ABN-A01	9.84	9.67	-0.17
25 YR 72 HR	N-ABO	1.59	1.59	0
25 YR 72 HR	N-ABO-A01	4.42	3.23	-1.19
25 YR 72 HR	N-ABO-A02	5.48	5.97	0.49
25 YR 72 HR	N-ABP	1.59	1.59	0
25 YR 72 HR	N-ABQ	1.59	1.59	0
25 YR 72 HR	N-ADA-A01	6.84	6.71	-0.13
25 YR 72 HR	N-ADA-A02	7.42	6.72	-0.7
25 YR 72 HR	N-ADA-A03	7.42	6.72	-0.7
25 YR 72 HR	N-ADA-A03x	7.41	6.72	-0.69
25 YR 72 HR	N-ADA-A04	7.44	6.73	-0.71
25 YR 72 HR	N-ADA-A05	7.44	6.73	-0.71
25 YR 72 HR	N-ADA-B02	7.08	6.6	-0.48
25 YR 72 HR	N-ADA-B03	7.07	6.59	-0.48
25 YR 72 HR	N-ADA-B03x	7.07	6.59	-0.48
25 YR 72 HR	N-ADA-B04	7.24	6.61	-0.63

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Area A Improvement Projects Selected Alternative (1A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ADB-08	7.46	7.12	-0.34
25 YR 72 HR	N-ADB-A01	7.6	6.97	-0.63
25 YR 72 HR	N-ADB-A02	7.61	7.06	-0.55
25 YR 72 HR	N-ADB-A03	8.59	7.11	-1.48
25 YR 72 HR	N-ADB-A04	8.88	7.12	-1.76
25 YR 72 HR	N-ADB-A04x	8.83	7.12	-1.71
25 YR 72 HR	N-ADB-B03	7.62	7.36	-0.26
25 YR 72 HR	N-ADB-B04	8.94	8.66	-0.28
25 YR 72 HR	N-ADB-B05	8.97	8.75	-0.22
25 YR 72 HR	N-ADB-B06	9.25	9.21	-0.04
25 YR 72 HR	N-ADB-B07	9.87	9.71	-0.16
25 YR 72 HR	N-ADB-B07x	9.8	9.65	-0.15
25 YR 72 HR	N-ADC-A01	8.23	6.75	-1.48
25 YR 72 HR	N-ADC-A02	8.23	6.75	-1.48
25 YR 72 HR	N-Add-01	#N/A	1.59	#N/A
25 YR 72 HR	N-Add-02	#N/A	1.59	#N/A
25 YR 72 HR	N-ADD-A01	8.55	7.29	-1.26
25 YR 72 HR	N-ADD-A02	8.75	7.61	-1.14
25 YR 72 HR	N-ADD-A03	10.99	9.37	-1.62
25 YR 72 HR	N-ADD-A04	10.99	9.82	-1.17
25 YR 72 HR	N-ADD-A04x	10.99	9.37	-1.62
25 YR 72 HR	N-ADD-A05	11.03	10.46	-0.57
25 YR 72 HR	N-ADD-A06	11.04	10.72	-0.32
25 YR 72 HR	N-ADD-A07	12.55	11.51	-1.04
25 YR 72 HR	N-ADD-A08	12.57	11.85	-0.72
25 YR 72 HR	N-ADD-A09	12.63	12.07	-0.56
25 YR 72 HR	N-ADD-A10	12.63	12.24	-0.39
25 YR 72 HR	N-ADD-A11	12.67	12.48	-0.19
25 YR 72 HR	N-ADD-A12	13.12	12.74	-0.38
25 YR 72 HR	N-ADD-A13	13.39	13.17	-0.22
25 YR 72 HR	N-ADD-A14	13.38	13.18	-0.2
25 YR 72 HR	N-ADD-A15	13.36	13.16	-0.2
25 YR 72 HR	N-ADD-A16	13.26	13.14	-0.12
25 YR 72 HR	N-ADD-B03	8.8	7.68	-1.12
25 YR 72 HR	N-ADD-B05	11.74	11.74	0
25 YR 72 HR	N-ADD-C04	11	10.69	-0.31
25 YR 72 HR	N-ADD-C05	11.27	11.27	0
25 YR 72 HR	N-ADD-D08	12.02	11.65	-0.37
25 YR 72 HR	N-ADD-D09	11.9	11.8	-0.1
25 YR 72 HR	N-ADD-H04	10.99	10.68	-0.31
25 YR 72 HR	N-ADD-N13	12.9	12.74	-0.16
25 YR 72 HR	N-ADD-N14	13.17	12.82	-0.35
25 YR 72 HR	N-ADD-N15	12.56	12.74	0.18
25 YR 72 HR	N-ADE-A01	7.76	6.91	-0.85

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ADE-A02	8.62	7.19	-1.43
25 YR 72 HR	N-ADE-A03	8.76	7.48	-1.28
25 YR 72 HR	N-ADE-A04	9.15	8.67	-0.48
25 YR 72 HR	N-ADE-A04x	8.78	7.49	-1.29
25 YR 72 HR	N-ADE-A05	10.89	10.89	0
25 YR 72 HR	N-ADE-A05x	9.15	8.67	-0.48
25 YR 72 HR	N-ADE-A06	11.25	11.25	0
25 YR 72 HR	N-ADE-B02	7.3	6.91	-0.39
25 YR 72 HR	N-ADE-B03	7.3	6.91	-0.39
25 YR 72 HR	N-ADE-C02	7.77	6.94	-0.83
25 YR 72 HR	N-ADE-C03	7.78	6.99	-0.79
25 YR 72 HR	N-ADE-D03	7.28	6.91	-0.37
25 YR 72 HR	N-ADS-A01	6.41	6.43	0.02
25 YR 72 HR	N-ADS-A02	6.41	6.43	0.02
25 YR 72 HR	N-ASA-A01	5.51	5.88	0.37
25 YR 72 HR	N-ASA-A02	5.51	5.89	0.38
25 YR 72 HR	N-ASA-A03	5.78	5.89	0.11
25 YR 72 HR	N-ASA-A04	5.92	5.9	-0.02
25 YR 72 HR	N-ASA-A05	6.09	5.91	-0.18
25 YR 72 HR	N-ASA-A06	6.17	5.92	-0.25
25 YR 72 HR	N-ASA-A07	6.19	5.92	-0.27
25 YR 72 HR	N-ASB-A01	5.59	5.9	0.31
25 YR 72 HR	N-ASB-A02	5.59	5.9	0.31
25 YR 72 HR	N-ASB-B02	5.83	5.91	0.08
25 YR 72 HR	N-ASC-A01	5.68	6.16	0.48
25 YR 72 HR	N-ASC-A02	6.83	6.58	-0.25
25 YR 72 HR	N-ASC-A03	7.11	6.63	-0.48
25 YR 72 HR	N-ASC-A04	7.12	6.66	-0.46
25 YR 72 HR	N-ASC-B02	6.17	6.16	-0.01
25 YR 72 HR	N-ASC-B03	6.26	6.18	-0.08
25 YR 72 HR	N-ASD-A01a	6.3	6.85	0.55
25 YR 72 HR	N-ASD-A02	8.51	8.84	0.33
25 YR 72 HR	N-ASD-A03	9.34	9.58	0.24
25 YR 72 HR	N-ASD-A04	10.42	10.53	0.11
25 YR 72 HR	N-ASD-A05	10.77	10.86	0.09
25 YR 72 HR	N-ASD-A06	11.44	11.49	0.05
25 YR 72 HR	N-ASD-A07	11.89	11.92	0.03
25 YR 72 HR	N-ASD-A08	12.44	12.46	0.02
25 YR 72 HR	N-ASD-A09	13.17	13.17	0
25 YR 72 HR	N-ASD-A11	14.09	14.09	0
25 YR 72 HR	N-ASD-A12	15.03	15.03	0
25 YR 72 HR	N-ASD-A13	15.62	15.62	0
25 YR 72 HR	N-ASD-A14	15.92	15.92	0
25 YR 72 HR	N-ASD-A15	16.41	16.41	0

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Area A Improvement Projects Selected Alternative (1A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASD-A16	14.31	14.31	0
25 YR 72 HR	N-ASD-A17	16.62	16.62	0
25 YR 72 HR	N-ASD-A18	15.58	15.58	0
25 YR 72 HR	N-ASD-A19	14.93	14.93	0
25 YR 72 HR	N-ASD-B02	6.43	7	0.57
25 YR 72 HR	N-ASD-B03	7.84	8.15	0.31
25 YR 72 HR	N-ASD-B04	8.09	8.33	0.24
25 YR 72 HR	N-ASD-B05	8.8	8.85	0.05
25 YR 72 HR	N-ASD-C03	8.95	9	0.05
25 YR 72 HR	N-ASD-C04	7.11	7.23	0.12
25 YR 72 HR	N-ASD-D04	8.96	9	0.04
25 YR 72 HR	N-ASD-D05	9	9.03	0.03
25 YR 72 HR	N-ASD-D06	8.77	8.78	0.01
25 YR 72 HR	N-ASD-D07	9.07	9.08	0.01
25 YR 72 HR	N-ASD-E04	9.84	10.02	0.18
25 YR 72 HR	N-ASD-E05	10.78	10.88	0.1
25 YR 72 HR	N-ASD-E06	10.98	11.07	0.09
25 YR 72 HR	N-ASD-E09	14.21	14.21	0
25 YR 72 HR	N-ASD-E10	13.9	13.9	0
25 YR 72 HR	N-ASD-F03	9	9.2	0.2
25 YR 72 HR	N-ASD-F04	9.28	9.29	0.01
25 YR 72 HR	N-ASD-F05	9.69	9.7	0.01
25 YR 72 HR	N-ASD-G04	9.35	9.58	0.23
25 YR 72 HR	N-ASD-H07	9.55	9.55	0
25 YR 72 HR	N-ASD-H08	9.55	9.55	0
25 YR 72 HR	N-ASD-I09	10.9	10.9	0
25 YR 72 HR	N-ASD-J10	12.54	12.54	0
25 YR 72 HR	N-ASD-K10	13.9	13.9	0
25 YR 72 HR	N-ASD-L07	11.3	11.3	0
25 YR 72 HR	N-ASD-Q06	10.93	11.03	0.1
25 YR 72 HR	N-ASD-Q08	11.7	11.73	0.03
25 YR 72 HR	N-ASD-Q09	12.78	12.79	0.01
25 YR 72 HR	N-ASD-R13	14.25	14.25	0
25 YR 72 HR	N-ASD-S13	14.85	14.85	0
25 YR 72 HR	N-ASD-T15	16.56	16.56	0
25 YR 72 HR	N-ASD-U06	10.79	10.89	0.1
25 YR 72 HR	N-ASE-A01	6.11	6.6	0.49
25 YR 72 HR	N-ASE-A02	6.38	7.11	0.73
25 YR 72 HR	N-ASE-A03	9.1	7.77	-1.33
25 YR 72 HR	N-ASE-A04	9.11	7.77	-1.34
25 YR 72 HR	N-ASE-A05	11.45	11.45	0
25 YR 72 HR	N-ASE-B02	6.14	6.6	0.46
25 YR 72 HR	N-ASE-C03	7.04	8.12	1.08
25 YR 72 HR	N-ASE-D03	7.87	8.13	0.26

Area A Improvement Projects Selected Alternative (1A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASF-A01	6.47	5.99	-0.48
25 YR 72 HR	N-ASF-A02	6.47	5.99	-0.48
25 YR 72 HR	N-ASG-A01	5.93	6.02	0.09
25 YR 72 HR	N-ASG-A02	6.27	6.09	-0.18
25 YR 72 HR	N-ASG-A03	6.8	6.12	-0.68
25 YR 72 HR	N-ASG-A04	7.46	6.16	-1.3
25 YR 72 HR	N-ASG-A05	7.46	6.18	-1.28
25 YR 72 HR	N-ASG-A06	7.13	7.13	0
25 YR 72 HR	N-ASG-B02	5.94	6.01	0.07
25 YR 72 HR	N-ASG-B03x	5.94	6.01	0.07
25 YR 72 HR	N-ASG-C04	6.54	6.16	-0.38
25 YR 72 HR	N-ASG-C05	6.45	6.17	-0.28
25 YR 72 HR	N-ASH-A01	5.94	6.01	0.07
25 YR 72 HR	N-ASH-A02	5.94	6.01	0.07
25 YR 72 HR	N-ASI-A01	5.47	5.59	0.12
25 YR 72 HR	N-ASJ	1.59	1.59	0
25 YR 72 HR	N-ASJ-A01	5.71	5.97	0.26
25 YR 72 HR	N-ASK-A01	5.55	5.99	0.44

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	J-ABK-A02	#N/A	5.03	#N/A
10 YR 1 HR	Junction-1	#N/A	5.58	#N/A
10 YR 1 HR	Junction-2	#N/A	5.73	#N/A
10 YR 1 HR	Junction-3	#N/A	5.56	#N/A
10 YR 1 HR	Junction-4	#N/A	5.71	#N/A
10 YR 1 HR	Junction-5	#N/A	3.3	#N/A
10 YR 1 HR	N-ABA	1.59	1.59	0
10 YR 1 HR	N-ABA-A01	3.66	2.08	-1.58
10 YR 1 HR	N-ABA-A02	3.83	1.99	-1.84
10 YR 1 HR	N-ABB	1.59	1.59	0
10 YR 1 HR	N-ABB-A01	3.57	2.46	-1.11
10 YR 1 HR	N-ABB-A02	4.23	2.5	-1.73
10 YR 1 HR	N-ABB-A03	4.23	2.52	-1.71
10 YR 1 HR	N-ABB-A04	4.23	2.56	-1.67
10 YR 1 HR	N-ABB-B02	4.25	2.46	-1.79
10 YR 1 HR	N-ABB-B03	4.27	2.51	-1.76
10 YR 1 HR	N-ABB-B03x	4.28	2.34	-1.94
10 YR 1 HR	N-ABB-B04	4.28	2.4	-1.88
10 YR 1 HR	N-ABC	1.59	1.59	0
10 YR 1 HR	N-ABC-A01	4.21	2.54	-1.67
10 YR 1 HR	N-ABC-A02	4.22	2.65	-1.57
10 YR 1 HR	N-ABC-B02	4.21	2.58	-1.63
10 YR 1 HR	N-ABD	1.59	1.59	0
10 YR 1 HR	N-ABD-A01	3.33	2.62	-0.71
10 YR 1 HR	N-ABD-A02	4.06	2.73	-1.33
10 YR 1 HR	N-ABD-A02x	3.76	2.64	-1.12
10 YR 1 HR	N-ABD-A03	4.64	2.85	-1.79
10 YR 1 HR	N-ABD-A03x	4.11	2.93	-1.18
10 YR 1 HR	N-ABD-A04	4.95	2.88	-2.07
10 YR 1 HR	N-ABD-A05	5.18	2.94	-2.24
10 YR 1 HR	N-ABD-A06	5.19	2.74	-2.45
10 YR 1 HR	N-ABD-A07	5.19	2.76	-2.43
10 YR 1 HR	N-ABD-B04	5.43	3.14	-2.29
10 YR 1 HR	N-ABD-B05	5.52	3.3	-2.22
10 YR 1 HR	N-ABD-B05x	5.43	3.15	-2.28
10 YR 1 HR	N-ABD-B06	5.53	3.34	-2.19
10 YR 1 HR	N-ABD-B07	6.17	4.01	-2.16
10 YR 1 HR	N-ABD-B08	7.41	7.41	0
10 YR 1 HR	N-ABE	1.59	1.59	0
10 YR 1 HR	N-ABE-A01	2.05	2.05	0
10 YR 1 HR	N-ABE-A02	2.68	2.68	0
10 YR 1 HR	N-ABF	1.59	1.59	0
10 YR 1 HR	N-ABF-A01	4.11	1.97	-2.14
10 YR 1 HR	N-ABF-A02	4.11	1.99	-2.12

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ABG	1.59	1.59	0
10 YR 1 HR	N-ABG-A01	4.53	1.64	-2.89
10 YR 1 HR	N-ABG-A02	4.76	2.68	-2.08
10 YR 1 HR	N-ABG-A03	4.79	2.68	-2.11
10 YR 1 HR	N-ABH	1.59	1.59	0
10 YR 1 HR	N-ABH-A01	4.07	1.67	-2.4
10 YR 1 HR	N-ABH-A02	4.98	3.81	-1.17
10 YR 1 HR	N-ABH-A03	4.98	3.84	-1.14
10 YR 1 HR	N-ABH-A03x	4.98	3.82	-1.16
10 YR 1 HR	N-ABH-B02	5.02	2.94	-2.08
10 YR 1 HR	N-ABH-B03	5.03	2.69	-2.34
10 YR 1 HR	N-ABH-B03x	5.03	4.19	-0.84
10 YR 1 HR	N-ABH-B04	5.04	2.7	-2.34
10 YR 1 HR	N-ABI	1.59	1.59	0
10 YR 1 HR	N-ABI-A01	4.93	1.84	-3.09
10 YR 1 HR	N-ABI-A02	4.93	3.57	-1.36
10 YR 1 HR	N-ABJ	1.59	1.59	0
10 YR 1 HR	N-ABJ-A01	4.95	1.85	-3.1
10 YR 1 HR	N-ABJ-A02	4.95	3.18	-1.77
10 YR 1 HR	N-ABK	1.59	1.59	0
10 YR 1 HR	N-ABK-A01	3.71	3.57	-0.14
10 YR 1 HR	N-ABK-A02x1	5.66	5.24	-0.42
10 YR 1 HR	N-ABK-A02x2	5.67	5.24	-0.43
10 YR 1 HR	N-ABK-B02	4.99	3.58	-1.41
10 YR 1 HR	N-ABK-B03	4.99	3.66	-1.33
10 YR 1 HR	N-ABK-B04	7.48	5.61	-1.87
10 YR 1 HR	N-ABL	1.59	1.59	0
10 YR 1 HR	N-ABL-A01	3.41	3.24	-0.17
10 YR 1 HR	N-ABL-A02	4.33	4.29	-0.04
10 YR 1 HR	N-ABM	1.59	1.59	0
10 YR 1 HR	N-ABM-A01	4.74	2.13	-2.61
10 YR 1 HR	N-ABM-A02	4.74	3.9	-0.84
10 YR 1 HR	N-ABN	1.59	1.59	0
10 YR 1 HR	N-ABN-A01	9.68	9.51	-0.17
10 YR 1 HR	N-ABO	1.59	1.59	0
10 YR 1 HR	N-ABO-A01	3.81	2.87	-0.94
10 YR 1 HR	N-ABO-A02	5.2	5.21	0.01
10 YR 1 HR	N-ABP	1.59	1.59	0
10 YR 1 HR	N-ABQ	1.59	1.59	0
10 YR 1 HR	N-ADA-A01	6.1	6.11	0.01
10 YR 1 HR	N-ADA-A02	6.92	6.38	-0.54
10 YR 1 HR	N-ADA-A03	6.93	6.39	-0.54
10 YR 1 HR	N-ADA-A03x	6.92	6.39	-0.53
10 YR 1 HR	N-ADA-A04	6.94	6.42	-0.52

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Area A Improvement Projects Unselected Alternative (2A)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADA-A05	6.94	6.42	-0.52
10 YR 1 HR	N-ADA-B02	6.57	5.82	-0.75
10 YR 1 HR	N-ADA-B03	6.57	5.6	-0.97
10 YR 1 HR	N-ADA-B03x	6.57	5.82	-0.75
10 YR 1 HR	N-ADA-B04	7.22	5.83	-1.39
10 YR 1 HR	N-ADB-08	7.07	7.06	-0.01
10 YR 1 HR	N-ADB-A01	7.3	5.3	-2
10 YR 1 HR	N-ADB-A02	7.48	5.32	-2.16
10 YR 1 HR	N-ADB-A03	8.47	5.32	-3.15
10 YR 1 HR	N-ADB-A04	8.84	5.32	-3.52
10 YR 1 HR	N-ADB-A04x	8.76	5.32	-3.44
10 YR 1 HR	N-ADB-B03	7.49	5.43	-2.06
10 YR 1 HR	N-ADB-B04	8.83	6	-2.83
10 YR 1 HR	N-ADB-B05	8.86	7.81	-1.05
10 YR 1 HR	N-ADB-B06	9.16	9.09	-0.07
10 YR 1 HR	N-ADB-B07	9.7	9.53	-0.17
10 YR 1 HR	N-ADB-B07x	9.66	9.51	-0.15
10 YR 1 HR	N-ADC-A01	7.96	5.24	-2.72
10 YR 1 HR	N-ADC-A02	7.97	5.24	-2.73
10 YR 1 HR	N-ADD-A01	7.8	6.22	-1.58
10 YR 1 HR	N-ADD-A02	7.93	6.44	-1.49
10 YR 1 HR	N-ADD-A03	10.93	6.89	-4.04
10 YR 1 HR	N-ADD-A04	10.93	7.43	-3.5
10 YR 1 HR	N-ADD-A04x	10.93	6.9	-4.03
10 YR 1 HR	N-ADD-A05	10.98	8.28	-2.7
10 YR 1 HR	N-ADD-A06	10.99	8.62	-2.37
10 YR 1 HR	N-ADD-A07	12.51	9.98	-2.53
10 YR 1 HR	N-ADD-A08	12.53	10.55	-1.98
10 YR 1 HR	N-ADD-A09	12.59	11.15	-1.44
10 YR 1 HR	N-ADD-A10	12.59	11.73	-0.86
10 YR 1 HR	N-ADD-A11	12.64	12.11	-0.53
10 YR 1 HR	N-ADD-A12	13.08	12.52	-0.56
10 YR 1 HR	N-ADD-A13	13.36	12.96	-0.4
10 YR 1 HR	N-ADD-A14	13.37	12.98	-0.39
10 YR 1 HR	N-ADD-A15	13.35	12.96	-0.39
10 YR 1 HR	N-ADD-A16	13.25	12.96	-0.29
10 YR 1 HR	N-ADD-B03	7.95	6.48	-1.47
10 YR 1 HR	N-ADD-B05	11.67	11.68	0.01
10 YR 1 HR	N-ADD-C04	10.94	10.66	-0.28
10 YR 1 HR	N-ADD-C05	11.24	11.24	0
10 YR 1 HR	N-ADD-D08	12.01	11.41	-0.6
10 YR 1 HR	N-ADD-D09	11.87	11.6	-0.27
10 YR 1 HR	N-ADD-H04	10.93	10.42	-0.51
10 YR 1 HR	N-ADD-N13	12.88	12.56	-0.32

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADD-N14	13.15	12.68	-0.47
10 YR 1 HR	N-ADD-N15	12.55	12.65	0.1
10 YR 1 HR	N-ADE-A01	6.96	4.88	-2.08
10 YR 1 HR	N-ADE-A02	8.4	5.8	-2.6
10 YR 1 HR	N-ADE-A03	8.68	6.25	-2.43
10 YR 1 HR	N-ADE-A04	9.1	8.35	-0.75
10 YR 1 HR	N-ADE-A04x	8.7	6.25	-2.45
10 YR 1 HR	N-ADE-A05	10.84	10.84	0
10 YR 1 HR	N-ADE-A05x	9.1	8.37	-0.73
10 YR 1 HR	N-ADE-A06	11.2	11.2	0
10 YR 1 HR	N-ADE-B02	7.01	4.94	-2.07
10 YR 1 HR	N-ADE-B03	7.02	4.94	-2.08
10 YR 1 HR	N-ADE-C02	7.52	4.72	-2.8
10 YR 1 HR	N-ADE-C03	7.54	4.83	-2.71
10 YR 1 HR	N-ADE-D03	7	4.96	-2.04
10 YR 1 HR	N-ADS-A01	5.67	5.26	-0.41
10 YR 1 HR	N-ADS-A02	5.99	5.26	-0.73
10 YR 1 HR	N-ASA-A01	5.41	2.83	-2.58
10 YR 1 HR	N-ASA-A02	5.41	2.83	-2.58
10 YR 1 HR	N-ASA-A03	5.61	2.87	-2.74
10 YR 1 HR	N-ASA-A04	5.72	2.9	-2.82
10 YR 1 HR	N-ASA-A05	5.89	2.96	-2.93
10 YR 1 HR	N-ASA-A06	6.09	3.01	-3.08
10 YR 1 HR	N-ASA-A07	6.12	3.02	-3.1
10 YR 1 HR	N-ASB-A01	5.55	3.03	-2.52
10 YR 1 HR	N-ASB-A02	5.55	2.97	-2.58
10 YR 1 HR	N-ASB-B02	5.8	3.04	-2.76
10 YR 1 HR	N-ASC-A01	5.32	3.21	-2.11
10 YR 1 HR	N-ASC-A02	5.99	4.16	-1.83
10 YR 1 HR	N-ASC-A03	6.24	4.21	-2.03
10 YR 1 HR	N-ASC-A04	6.5	4.23	-2.27
10 YR 1 HR	N-ASC-B02	5.61	3.16	-2.45
10 YR 1 HR	N-ASC-B03	5.65	3.21	-2.44
10 YR 1 HR	N-ASD-A01a	5.82	6.14	0.32
10 YR 1 HR	N-ASD-A02	8.07	8.33	0.26
10 YR 1 HR	N-ASD-A03	8.89	9.11	0.22
10 YR 1 HR	N-ASD-A04	9.95	10.13	0.18
10 YR 1 HR	N-ASD-A05	10.3	10.45	0.15
10 YR 1 HR	N-ASD-A06	10.99	11.12	0.13
10 YR 1 HR	N-ASD-A07	11.55	11.65	0.1
10 YR 1 HR	N-ASD-A08	12.21	12.27	0.06
10 YR 1 HR	N-ASD-A09	13.04	13.06	0.02
10 YR 1 HR	N-ASD-A11	14.02	14.02	0
10 YR 1 HR	N-ASD-A12	14.91	14.91	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASD-A13	15.49	15.5	0.01
10 YR 1 HR	N-ASD-A14	15.82	15.82	0
10 YR 1 HR	N-ASD-A15	16.4	16.4	0
10 YR 1 HR	N-ASD-A16	14.3	14.3	0
10 YR 1 HR	N-ASD-A17	16.61	16.61	0
10 YR 1 HR	N-ASD-A18	15.58	15.58	0
10 YR 1 HR	N-ASD-A19	14.92	14.92	0
10 YR 1 HR	N-ASD-B02	5.9	6.2	0.3
10 YR 1 HR	N-ASD-B03	7.08	6.89	-0.19
10 YR 1 HR	N-ASD-B04	7.52	7.55	0.03
10 YR 1 HR	N-ASD-B05	8.63	8.22	-0.41
10 YR 1 HR	N-ASD-C03	6.06	6.26	0.2
10 YR 1 HR	N-ASD-C04	6.08	6.18	0.1
10 YR 1 HR	N-ASD-D04	7.85	7.67	-0.18
10 YR 1 HR	N-ASD-D05	8.43	8.41	-0.02
10 YR 1 HR	N-ASD-D06	8.14	8.14	0
10 YR 1 HR	N-ASD-D07	8.49	8.47	-0.02
10 YR 1 HR	N-ASD-E04	9.39	9.6	0.21
10 YR 1 HR	N-ASD-E05	10.23	10.39	0.16
10 YR 1 HR	N-ASD-E06	10.4	10.54	0.14
10 YR 1 HR	N-ASD-E09	14.14	14.14	0
10 YR 1 HR	N-ASD-E10	13.84	13.84	0
10 YR 1 HR	N-ASD-F03	8.62	8.41	-0.21
10 YR 1 HR	N-ASD-F04	9.24	8.78	-0.46
10 YR 1 HR	N-ASD-F05	9.67	9.25	-0.42
10 YR 1 HR	N-ASD-G04	8.9	9.13	0.23
10 YR 1 HR	N-ASD-H07	9.29	9.29	0
10 YR 1 HR	N-ASD-H08	9.42	9.42	0
10 YR 1 HR	N-ASD-I09	10.85	10.86	0.01
10 YR 1 HR	N-ASD-J10	12.51	12.51	0
10 YR 1 HR	N-ASD-K10	13.86	13.86	0
10 YR 1 HR	N-ASD-L07	10.46	10.47	0.01
10 YR 1 HR	N-ASD-Q06	10.32	10.46	0.14
10 YR 1 HR	N-ASD-Q08	11.23	11.35	0.12
10 YR 1 HR	N-ASD-Q09	12.64	12.67	0.03
10 YR 1 HR	N-ASD-R13	14.22	14.22	0
10 YR 1 HR	N-ASD-S13	14.84	14.84	0
10 YR 1 HR	N-ASD-T15	16.56	16.56	0
10 YR 1 HR	N-ASD-U06	10.26	10.42	0.16
10 YR 1 HR	N-ASE-A01	5.62	5.71	0.09
10 YR 1 HR	N-ASE-A02	5.82	5.95	0.13
10 YR 1 HR	N-ASE-A03	7.99	6.22	-1.77
10 YR 1 HR	N-ASE-A04	7.99	6.26	-1.73
10 YR 1 HR	N-ASE-A05	11.37	11.37	0

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Area A Improvement Projects Unselected Alternative (2A)
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Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASE-B02	5.67	5.71	0.04
10 YR 1 HR	N-ASE-C03	6.14	6.78	0.64
10 YR 1 HR	N-ASE-D03	6.79	7.93	1.14
10 YR 1 HR	N-ASF-A01	6.28	5.22	-1.06
10 YR 1 HR	N-ASF-A02	6.28	5.23	-1.05
10 YR 1 HR	N-ASG-A01	5.69	5.27	-0.42
10 YR 1 HR	N-ASG-A02	6.03	5.31	-0.72
10 YR 1 HR	N-ASG-A03	6.51	5.32	-1.19
10 YR 1 HR	N-ASG-A04	7.03	5.35	-1.68
10 YR 1 HR	N-ASG-A05	7.03	5.36	-1.67
10 YR 1 HR	N-ASG-A06	7.11	7.11	0
10 YR 1 HR	N-ASG-B02	5.72	5.27	-0.45
10 YR 1 HR	N-ASG-B03x	5.72	5.27	-0.45
10 YR 1 HR	N-ASG-C04	6.42	5.34	-1.08
10 YR 1 HR	N-ASG-C05	6.4	5.35	-1.05
10 YR 1 HR	N-ASH-A01	5.56	5.24	-0.32
10 YR 1 HR	N-ASH-A02	5.65	5.65	0
10 YR 1 HR	N-ASI-A01	5.43	5.22	-0.21
10 YR 1 HR	N-ASJ	1.59	1.59	0
10 YR 1 HR	N-ASJ-A01	5.69	5.69	0
10 YR 1 HR	N-ASK-A01	5.42	5.42	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	J-ABK-A02	#N/A	6.18	#N/A
25 YR 72 HR	Junction-1	#N/A	6.19	#N/A
25 YR 72 HR	Junction-2	#N/A	6.38	#N/A
25 YR 72 HR	Junction-3	#N/A	6.18	#N/A
25 YR 72 HR	Junction-4	#N/A	6.38	#N/A
25 YR 72 HR	Junction-5	#N/A	4.58	#N/A
25 YR 72 HR	N-ABA	1.59	1.59	0
25 YR 72 HR	N-ABA-A01	4.85	3.09	-1.76
25 YR 72 HR	N-ABA-A02	4.85	3	-1.85
25 YR 72 HR	N-ABB	1.59	1.59	0
25 YR 72 HR	N-ABB-A01	4.04	3.44	-0.6
25 YR 72 HR	N-ABB-A02	4.87	3.48	-1.39
25 YR 72 HR	N-ABB-A03	4.88	3.49	-1.39
25 YR 72 HR	N-ABB-A04	4.88	3.57	-1.31
25 YR 72 HR	N-ABB-B02	4.87	3.47	-1.4
25 YR 72 HR	N-ABB-B03	4.87	3.6	-1.27
25 YR 72 HR	N-ABB-B03x	4.87	3.35	-1.52
25 YR 72 HR	N-ABB-B04	4.87	3.48	-1.39
25 YR 72 HR	N-ABC	1.59	1.59	0
25 YR 72 HR	N-ABC-A01	4.89	3.51	-1.38
25 YR 72 HR	N-ABC-A02	4.89	3.72	-1.17
25 YR 72 HR	N-ABC-B02	4.89	3.58	-1.31
25 YR 72 HR	N-ABD	1.59	1.59	0
25 YR 72 HR	N-ABD-A01	4.91	3.59	-1.32
25 YR 72 HR	N-ABD-A02	4.92	3.78	-1.14
25 YR 72 HR	N-ABD-A02x	4.92	3.62	-1.3
25 YR 72 HR	N-ABD-A03	5.22	3.99	-1.23
25 YR 72 HR	N-ABD-A03x	4.93	3.98	-0.95
25 YR 72 HR	N-ABD-A04	5.6	4.02	-1.58
25 YR 72 HR	N-ABD-A05	5.66	4.14	-1.52
25 YR 72 HR	N-ABD-A06	5.28	3.8	-1.48
25 YR 72 HR	N-ABD-A07	5.28	3.82	-1.46
25 YR 72 HR	N-ABD-B04	5.73	4.48	-1.25
25 YR 72 HR	N-ABD-B05	5.74	4.74	-1
25 YR 72 HR	N-ABD-B05x	5.72	4.5	-1.22
25 YR 72 HR	N-ABD-B06	5.74	4.8	-0.94
25 YR 72 HR	N-ABD-B07	6.82	5.96	-0.86
25 YR 72 HR	N-ABD-B08	7.49	7.49	0
25 YR 72 HR	N-ABE	1.59	1.59	0
25 YR 72 HR	N-ABE-A01	4.89	2.32	-2.57
25 YR 72 HR	N-ABE-A02	4.89	3.33	-1.56
25 YR 72 HR	N-ABF	1.59	1.59	0
25 YR 72 HR	N-ABF-A01	4.88	2.2	-2.68
25 YR 72 HR	N-ABF-A02	4.89	2.24	-2.65

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ABG	1.59	1.59	0
25 YR 72 HR	N-ABG-A01	5.04	2.05	-2.99
25 YR 72 HR	N-ABG-A02	5.04	3.68	-1.36
25 YR 72 HR	N-ABG-A03	5.05	3.7	-1.35
25 YR 72 HR	N-ABH	1.59	1.59	0
25 YR 72 HR	N-ABH-A01	4.6	1.83	-2.77
25 YR 72 HR	N-ABH-A02	5.53	4.13	-1.4
25 YR 72 HR	N-ABH-A03	5.53	4.17	-1.36
25 YR 72 HR	N-ABH-A03x	5.53	4.15	-1.38
25 YR 72 HR	N-ABH-B02	5.57	3.74	-1.83
25 YR 72 HR	N-ABH-B03	5.58	3.72	-1.86
25 YR 72 HR	N-ABH-B03x	5.59	4.66	-0.93
25 YR 72 HR	N-ABH-B04	5.59	3.72	-1.87
25 YR 72 HR	N-ABI	1.59	1.59	0
25 YR 72 HR	N-ABI-A01	5.52	1.98	-3.54
25 YR 72 HR	N-ABI-A02	5.52	3.68	-1.84
25 YR 72 HR	N-ABJ	1.59	1.59	0
25 YR 72 HR	N-ABJ-A01	5.52	1.99	-3.53
25 YR 72 HR	N-ABJ-A02	5.52	3.28	-2.24
25 YR 72 HR	N-ABK	1.59	1.59	0
25 YR 72 HR	N-ABK-A01	4.39	4.26	-0.13
25 YR 72 HR	N-ABK-A02x1	6.85	6.71	-0.14
25 YR 72 HR	N-ABK-A02x2	6.86	6.72	-0.14
25 YR 72 HR	N-ABK-B02	5.47	4.31	-1.16
25 YR 72 HR	N-ABK-B03	5.47	4.32	-1.15
25 YR 72 HR	N-ABK-B04	7.51	6.61	-0.9
25 YR 72 HR	N-ABL	1.59	1.59	0
25 YR 72 HR	N-ABL-A01	5.23	4.06	-1.17
25 YR 72 HR	N-ABL-A02	5.22	4.41	-0.81
25 YR 72 HR	N-ABM	1.59	1.59	0
25 YR 72 HR	N-ABM-A01	5.22	2.47	-2.75
25 YR 72 HR	N-ABM-A02	5.22	4.08	-1.14
25 YR 72 HR	N-ABN	1.59	1.59	0
25 YR 72 HR	N-ABN-A01	9.84	9.67	-0.17
25 YR 72 HR	N-ABO	1.59	1.59	0
25 YR 72 HR	N-ABO-A01	4.42	3.09	-1.33
25 YR 72 HR	N-ABO-A02	5.48	5.68	0.2
25 YR 72 HR	N-ABP	1.59	1.59	0
25 YR 72 HR	N-ABQ	1.59	1.59	0
25 YR 72 HR	N-ADA-A01	6.84	6.66	-0.18
25 YR 72 HR	N-ADA-A02	7.42	6.83	-0.59
25 YR 72 HR	N-ADA-A03	7.42	6.83	-0.59
25 YR 72 HR	N-ADA-A03x	7.41	6.83	-0.58
25 YR 72 HR	N-ADA-A04	7.44	6.86	-0.58

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ADA-A05	7.44	6.86	-0.58
25 YR 72 HR	N-ADA-B02	7.08	6.5	-0.58
25 YR 72 HR	N-ADA-B03	7.07	6.49	-0.58
25 YR 72 HR	N-ADA-B03x	7.07	6.49	-0.58
25 YR 72 HR	N-ADA-B04	7.24	6.57	-0.67
25 YR 72 HR	N-ADB-08	7.46	7.12	-0.34
25 YR 72 HR	N-ADB-A01	7.6	6.83	-0.77
25 YR 72 HR	N-ADB-A02	7.61	6.9	-0.71
25 YR 72 HR	N-ADB-A03	8.59	6.93	-1.66
25 YR 72 HR	N-ADB-A04	8.88	6.93	-1.95
25 YR 72 HR	N-ADB-A04x	8.83	6.93	-1.9
25 YR 72 HR	N-ADB-B03	7.62	7.24	-0.38
25 YR 72 HR	N-ADB-B04	8.94	8.32	-0.62
25 YR 72 HR	N-ADB-B05	8.97	8.64	-0.33
25 YR 72 HR	N-ADB-B06	9.25	9.21	-0.04
25 YR 72 HR	N-ADB-B07	9.87	9.7	-0.17
25 YR 72 HR	N-ADB-B07x	9.8	9.65	-0.15
25 YR 72 HR	N-ADC-A01	8.23	6.72	-1.51
25 YR 72 HR	N-ADC-A02	8.23	6.72	-1.51
25 YR 72 HR	N-ADD-A01	8.55	6.74	-1.81
25 YR 72 HR	N-ADD-A02	8.75	6.9	-1.85
25 YR 72 HR	N-ADD-A03	10.99	7.45	-3.54
25 YR 72 HR	N-ADD-A04	10.99	8.06	-2.93
25 YR 72 HR	N-ADD-A04x	10.99	7.45	-3.54
25 YR 72 HR	N-ADD-A05	11.03	8.99	-2.04
25 YR 72 HR	N-ADD-A06	11.04	9.35	-1.69
25 YR 72 HR	N-ADD-A07	12.55	10.69	-1.86
25 YR 72 HR	N-ADD-A08	12.57	11.2	-1.37
25 YR 72 HR	N-ADD-A09	12.63	11.58	-1.05
25 YR 72 HR	N-ADD-A10	12.63	11.98	-0.65
25 YR 72 HR	N-ADD-A11	12.67	12.33	-0.34
25 YR 72 HR	N-ADD-A12	13.12	12.68	-0.44
25 YR 72 HR	N-ADD-A13	13.39	13.14	-0.25
25 YR 72 HR	N-ADD-A14	13.38	13.15	-0.23
25 YR 72 HR	N-ADD-A15	13.36	13.13	-0.23
25 YR 72 HR	N-ADD-A16	13.26	13.12	-0.14
25 YR 72 HR	N-ADD-B03	8.8	6.98	-1.82
25 YR 72 HR	N-ADD-B05	11.74	11.74	0
25 YR 72 HR	N-ADD-C04	11	10.69	-0.31
25 YR 72 HR	N-ADD-C05	11.27	11.27	0
25 YR 72 HR	N-ADD-D08	12.02	11.51	-0.51
25 YR 72 HR	N-ADD-D09	11.9	11.71	-0.19
25 YR 72 HR	N-ADD-H04	10.99	10.66	-0.33
25 YR 72 HR	N-ADD-N13	12.9	12.68	-0.22

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ADD-N14	13.17	12.78	-0.39
25 YR 72 HR	N-ADD-N15	12.56	12.72	0.16
25 YR 72 HR	N-ADE-A01	7.76	6.45	-1.31
25 YR 72 HR	N-ADE-A02	8.62	7.48	-1.14
25 YR 72 HR	N-ADE-A03	8.76	8.01	-0.75
25 YR 72 HR	N-ADE-A04	9.15	8.95	-0.2
25 YR 72 HR	N-ADE-A04x	8.78	8.04	-0.74
25 YR 72 HR	N-ADE-A05	10.89	10.89	0
25 YR 72 HR	N-ADE-A05x	9.15	8.95	-0.2
25 YR 72 HR	N-ADE-A06	11.25	11.25	0
25 YR 72 HR	N-ADE-B02	7.3	6.53	-0.77
25 YR 72 HR	N-ADE-B03	7.3	6.54	-0.76
25 YR 72 HR	N-ADE-C02	7.77	6.27	-1.5
25 YR 72 HR	N-ADE-C03	7.78	6.46	-1.32
25 YR 72 HR	N-ADE-D03	7.28	6.56	-0.72
25 YR 72 HR	N-ADS-A01	6.41	6.39	-0.02
25 YR 72 HR	N-ADS-A02	6.41	6.39	-0.02
25 YR 72 HR	N-ASA-A01	5.51	4.01	-1.5
25 YR 72 HR	N-ASA-A02	5.51	4	-1.51
25 YR 72 HR	N-ASA-A03	5.78	4.07	-1.71
25 YR 72 HR	N-ASA-A04	5.92	4.13	-1.79
25 YR 72 HR	N-ASA-A05	6.09	4.22	-1.87
25 YR 72 HR	N-ASA-A06	6.17	4.32	-1.85
25 YR 72 HR	N-ASA-A07	6.19	4.33	-1.86
25 YR 72 HR	N-ASB-A01	5.59	4.27	-1.32
25 YR 72 HR	N-ASB-A02	5.59	4.19	-1.4
25 YR 72 HR	N-ASB-B02	5.83	4.27	-1.56
25 YR 72 HR	N-ASC-A01	5.68	4.52	-1.16
25 YR 72 HR	N-ASC-A02	6.83	5.65	-1.18
25 YR 72 HR	N-ASC-A03	7.11	5.72	-1.39
25 YR 72 HR	N-ASC-A04	7.12	5.78	-1.34
25 YR 72 HR	N-ASC-B02	6.17	4.45	-1.72
25 YR 72 HR	N-ASC-B03	6.26	4.48	-1.78
25 YR 72 HR	N-ASD-A01a	6.3	6.87	0.57
25 YR 72 HR	N-ASD-A02	8.51	8.85	0.34
25 YR 72 HR	N-ASD-A03	9.34	9.59	0.25
25 YR 72 HR	N-ASD-A04	10.42	10.54	0.12
25 YR 72 HR	N-ASD-A05	10.77	10.88	0.11
25 YR 72 HR	N-ASD-A06	11.44	11.51	0.07
25 YR 72 HR	N-ASD-A07	11.89	11.95	0.06
25 YR 72 HR	N-ASD-A08	12.44	12.48	0.04
25 YR 72 HR	N-ASD-A09	13.17	13.18	0.01
25 YR 72 HR	N-ASD-A11	14.09	14.1	0.01
25 YR 72 HR	N-ASD-A12	15.03	15.03	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASD-A13	15.62	15.62	0
25 YR 72 HR	N-ASD-A14	15.92	15.92	0
25 YR 72 HR	N-ASD-A15	16.41	16.41	0
25 YR 72 HR	N-ASD-A16	14.31	14.31	0
25 YR 72 HR	N-ASD-A17	16.62	16.62	0
25 YR 72 HR	N-ASD-A18	15.58	15.58	0
25 YR 72 HR	N-ASD-A19	14.93	14.93	0
25 YR 72 HR	N-ASD-B02	6.43	6.96	0.53
25 YR 72 HR	N-ASD-B03	7.84	7.66	-0.18
25 YR 72 HR	N-ASD-B04	8.09	8.06	-0.03
25 YR 72 HR	N-ASD-B05	8.8	8.48	-0.32
25 YR 72 HR	N-ASD-C03	8.95	8.96	0.01
25 YR 72 HR	N-ASD-C04	7.11	7.21	0.1
25 YR 72 HR	N-ASD-D04	8.96	8.94	-0.02
25 YR 72 HR	N-ASD-D05	9	9	0
25 YR 72 HR	N-ASD-D06	8.77	8.77	0
25 YR 72 HR	N-ASD-D07	9.07	9.07	0
25 YR 72 HR	N-ASD-E04	9.84	10.03	0.19
25 YR 72 HR	N-ASD-E05	10.78	10.89	0.11
25 YR 72 HR	N-ASD-E06	10.98	11.09	0.11
25 YR 72 HR	N-ASD-E09	14.21	14.22	0.01
25 YR 72 HR	N-ASD-E10	13.9	13.91	0.01
25 YR 72 HR	N-ASD-F03	9	8.9	-0.1
25 YR 72 HR	N-ASD-F04	9.28	9.17	-0.11
25 YR 72 HR	N-ASD-F05	9.69	9.64	-0.05
25 YR 72 HR	N-ASD-G04	9.35	9.59	0.24
25 YR 72 HR	N-ASD-H07	9.55	9.55	0
25 YR 72 HR	N-ASD-H08	9.55	9.55	0
25 YR 72 HR	N-ASD-I09	10.9	10.9	0
25 YR 72 HR	N-ASD-J10	12.54	12.54	0
25 YR 72 HR	N-ASD-K10	13.9	13.9	0
25 YR 72 HR	N-ASD-L07	11.3	11.31	0.01
25 YR 72 HR	N-ASD-Q06	10.93	11.04	0.11
25 YR 72 HR	N-ASD-Q08	11.7	11.76	0.06
25 YR 72 HR	N-ASD-Q09	12.78	12.8	0.02
25 YR 72 HR	N-ASD-R13	14.25	14.25	0
25 YR 72 HR	N-ASD-S13	14.85	14.85	0
25 YR 72 HR	N-ASD-T15	16.56	16.56	0
25 YR 72 HR	N-ASD-U06	10.79	10.9	0.11
25 YR 72 HR	N-ASE-A01	6.11	6.39	0.28
25 YR 72 HR	N-ASE-A02	6.38	6.91	0.53
25 YR 72 HR	N-ASE-A03	9.1	7.6	-1.5
25 YR 72 HR	N-ASE-A04	9.11	7.61	-1.5
25 YR 72 HR	N-ASE-A05	11.45	11.45	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASE-B02	6.14	6.39	0.25
25 YR 72 HR	N-ASE-C03	7.04	8.12	1.08
25 YR 72 HR	N-ASE-D03	7.87	8.13	0.26
25 YR 72 HR	N-ASF-A01	6.47	5.7	-0.77
25 YR 72 HR	N-ASF-A02	6.47	5.71	-0.76
25 YR 72 HR	N-ASG-A01	5.93	5.75	-0.18
25 YR 72 HR	N-ASG-A02	6.27	5.81	-0.46
25 YR 72 HR	N-ASG-A03	6.8	5.83	-0.97
25 YR 72 HR	N-ASG-A04	7.46	5.87	-1.59
25 YR 72 HR	N-ASG-A05	7.46	5.88	-1.58
25 YR 72 HR	N-ASG-A06	7.13	7.13	0
25 YR 72 HR	N-ASG-B02	5.94	5.76	-0.18
25 YR 72 HR	N-ASG-B03x	5.94	5.75	-0.19
25 YR 72 HR	N-ASG-C04	6.54	5.85	-0.69
25 YR 72 HR	N-ASG-C05	6.45	5.86	-0.59
25 YR 72 HR	N-ASH-A01	5.94	5.74	-0.2
25 YR 72 HR	N-ASH-A02	5.94	5.75	-0.19
25 YR 72 HR	N-ASI-A01	5.47	5.54	0.07
25 YR 72 HR	N-ASJ	1.59	1.59	0
25 YR 72 HR	N-ASJ-A01	5.71	5.71	0
25 YR 72 HR	N-ASK-A01	5.55	5.72	0.17

Kimley»Horn

Area BCDE Improvement Projects Selected Alternative (2BC,3D,1E)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	9thSt-Node	#N/A	-1.21	#N/A
10 yr 1 hr	B-Pump Node	#N/A	-3.7	#N/A
10 yr 1 hr	B-Pump Node 2	#N/A	-2.29	#N/A
10 yr 1 hr	N-BA	1.59	1.59	0
10 yr 1 hr	N-BA-A01	3.33	-1.74	-5.07
10 yr 1 hr	N-BA-A02	3.37	-0.57	-3.94
10 yr 1 hr	N-BA-A03	3.4	-0.2	-3.6
10 yr 1 hr	N-BA-A03x	3.37	0.77	-2.6
10 yr 1 hr	N-BA-A04	3.46	0.04	-3.42
10 yr 1 hr	N-BA-A04x	3.4	1.11	-2.29
10 yr 1 hr	N-BA-A05	3.46	0.15	-3.31
10 yr 1 hr	N-BA-A06	3.58	0.28	-3.3
10 yr 1 hr	N-BA-A07	3.65	0.52	-3.13
10 yr 1 hr	N-BA-A07x	3.61	0.72	-2.89
10 yr 1 hr	N-BA-A08	3.76	0.6	-3.16
10 yr 1 hr	N-BA-A08x	3.65	0.54	-3.11
10 yr 1 hr	N-BA-A09	3.91	3.87	-0.04
10 yr 1 hr	N-BA-B02	3.26	0.9	-2.36
10 yr 1 hr	N-BA-B03	3.26	1.08	-2.18
10 yr 1 hr	N-BA-B04	3.25	1.14	-2.11
10 yr 1 hr	N-BA-C03	3.33	1.66	-1.67
10 yr 1 hr	N-BA-C04	3.32	1.6	-1.72
10 yr 1 hr	N-BA-D05	3.48	0.04	-3.44
10 yr 1 hr	N-BA-D06	3.49	0.95	-2.54
10 yr 1 hr	N-BA-D07	3.65	1.21	-2.44
10 yr 1 hr	N-BA-D08	3.72	1.22	-2.5
10 yr 1 hr	N-BA-E09	3.76	0.77	-2.99
10 yr 1 hr	N-BA-F09	3.87	2.18	-1.69
10 yr 1 hr	N-BA-K04	3.39	1.97	-1.42
10 yr 1 hr	N-BA-K05	3.41	2.61	-0.8
10 yr 1 hr	N-BA-K06	3.6	2.97	-0.63
10 yr 1 hr	N-BA-K08	5.06	5.04	-0.02
10 yr 1 hr	N-BA-L06	3.54	2.28	-1.26
10 yr 1 hr	N-BA-Q05	3.38	-1.27	-4.65
10 yr 1 hr	N-BA-Q06	3.38	-1.27	-4.65
10 yr 1 hr	N-BA-Q06x	3.38	-1.27	-4.65
10 yr 1 hr	N-BA-Q07	3.38	-1.26	-4.64
10 yr 1 hr	N-BA-Q07x	3.37	-1.24	-4.61
10 yr 1 hr	N-BA-Q08	3.39	-0.3	-3.69
10 yr 1 hr	N-BA-R06	3.39	-1.26	-4.65
10 yr 1 hr	N-BA-R07	3.38	-1.26	-4.64
10 yr 1 hr	N-BA-R07x	3.4	-0.06	-3.46
10 yr 1 hr	N-BA-R08	3.38	-1.29	-4.67
10 yr 1 hr	N-BA-R08x	3.39	-1.12	-4.51

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA-R09	3.38	-1.23	-4.61
10 yr 1 hr	N-BA-R10	3.38	-0.2	-3.58
10 yr 1 hr	N-BA-R11	3.37	-0.19	-3.56
10 yr 1 hr	N-BA-S06a	3.68	2.72	-0.96
10 yr 1 hr	N-BA-T07	3.69	0.65	-3.04
10 yr 1 hr	N-BA-T08	3.68	0.63	-3.05
10 yr 1 hr	N-BA-T08x	3.69	0.69	-3
10 yr 1 hr	N-BA-T09	3.4	0.63	-2.77
10 yr 1 hr	N-BA-T09x	3.68	0.64	-3.04
10 yr 1 hr	N-BA-T10	3.4	0.63	-2.77
10 yr 1 hr	N-BA-U02	3.32	0.04	-3.28
10 yr 1 hr	N-BA-U03	3.33	0.05	-3.28
10 yr 1 hr	N-BA-V07	3.75	3.71	-0.04
10 yr 1 hr	N-BA-W08	4.19	4.02	-0.17
10 yr 1 hr	N-BA-W09A	4.2	4.04	-0.16
10 yr 1 hr	N-BA-W09B	4.17	4.01	-0.16
10 yr 1 hr	N-BB	1.59	1.59	0
10 yr 1 hr	N-BB-A01	3.32	-1.06	-4.38
10 yr 1 hr	N-BB-A02	3.33	-1.07	-4.4
10 yr 1 hr	N-BB-A03	3.31	-0.35	-3.66
10 yr 1 hr	N-BB-A04	3.32	-0.34	-3.66
10 yr 1 hr	N-BC	1.59	1.59	0
10 yr 1 hr	N-BC-A01	2.39	2.55	0.16
10 yr 1 hr	N-BC-A02	4.78	3.04	-1.74
10 yr 1 hr	N-BD	1.59	1.59	0
10 yr 1 hr	N-BD-A01	3.33	-2.89	-6.22
10 yr 1 hr	N-BD-A02	3.36	-1.37	-4.73
10 yr 1 hr	N-BD-A02x	3.37	-0.51	-3.88
10 yr 1 hr	N-BD-A03	3.37	-1.31	-4.68
10 yr 1 hr	N-BD-A05	3.37	-1.23	-4.6
10 yr 1 hr	N-BD-B02	3.33	-1.9	-5.23
10 yr 1 hr	N-BD-B03	3.32	-1.36	-4.68
10 yr 1 hr	N-BD-B04	3.32	2.41	-0.91
10 yr 1 hr	N-BD-B04x	3.32	-1.2	-4.52
10 yr 1 hr	N-BE	1.59	1.59	0
10 yr 1 hr	N-BE-A01	3.31	3.03	-0.28
10 yr 1 hr	N-BE-A03	3.39	1.61	-1.78
10 yr 1 hr	N-BE-A04	3.4	1.66	-1.74
10 yr 1 hr	N-BF	1.59	1.59	0
10 yr 1 hr	N-BF-A01	3.9	3.76	-0.14
10 yr 1 hr	N-BG	#N/A	1.59	#N/A
10 yr 1 hr	N-CA	1.59	1.59	0
10 yr 1 hr	N-CA-A01c	5.81	5.09	-0.72
10 yr 1 hr	N-CA-A01d	3.23	-4.09	-7.32

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-A02	3.35	-2.97	-6.32
10 yr 1 hr	N-CA-A03	3.37	-2.12	-5.49
10 yr 1 hr	N-CA-A04	3.4	-0.1	-3.5
10 yr 1 hr	N-CA-A05	3.41	1.43	-1.98
10 yr 1 hr	N-CA-A07	4.72	4.64	-0.08
10 yr 1 hr	N-CA-B03	3.36	1.43	-1.93
10 yr 1 hr	N-CA-B04	3.38	1.43	-1.95
10 yr 1 hr	N-CA-B07	4.35	3.58	-0.77
10 yr 1 hr	N-CA-C03	3.13	-1.72	-4.85
10 yr 1 hr	N-CA-C04	3.11	-1.72	-4.83
10 yr 1 hr	N-CA-C05	3.14	2.65	-0.49
10 yr 1 hr	N-CA-D06	3.62	3.56	-0.06
10 yr 1 hr	N-CA-D07	3.62	1.52	-2.1
10 yr 1 hr	N-CA-D07x	3.79	3.79	0
10 yr 1 hr	N-CA-D08	3.13	-0.2	-3.33
10 yr 1 hr	N-CA-D08x	3.64	1.55	-2.09
10 yr 1 hr	N-CA-D09x	3.13	-0.16	-3.29
10 yr 1 hr	N-CA-E07	4.42	3.74	-0.68
10 yr 1 hr	N-CA-E08	4.43	3.75	-0.68
10 yr 1 hr	N-CA-E09x	4.57	3.77	-0.8
10 yr 1 hr	N-CA-F04	3.37	-2.38	-5.75
10 yr 1 hr	N-CA-F05	3.09	-1.01	-4.1
10 yr 1 hr	N-CA-F05x	3.19	-2.39	-5.58
10 yr 1 hr	N-CA-F06	3.08	-2.16	-5.24
10 yr 1 hr	N-CA-F06x	3.07	-0.99	-4.06
10 yr 1 hr	N-CA-F07	3.08	-1.97	-5.05
10 yr 1 hr	N-CA-F07x	3.07	-1.46	-4.53
10 yr 1 hr	N-CA-F08	3.09	-1.68	-4.77
10 yr 1 hr	N-CA-F09	3.09	-0.56	-3.65
10 yr 1 hr	N-CA-F09x	3.09	-1.28	-4.37
10 yr 1 hr	N-CA-F10	3.1	-0.28	-3.38
10 yr 1 hr	N-CA-F11	3.1	-0.21	-3.31
10 yr 1 hr	N-CA-F11x	3.09	-0.22	-3.31
10 yr 1 hr	N-CA-F12	3.1	-0.21	-3.31
10 yr 1 hr	N-CA-F12x	3.1	0.99	-2.11
10 yr 1 hr	N-CA-G08	3.1	-0.69	-3.79
10 yr 1 hr	N-CA-G09	3.1	-0.65	-3.75
10 yr 1 hr	N-CA-G10	3.39	-0.63	-4.02
10 yr 1 hr	N-CA-G11x	3.37	0.11	-3.26
10 yr 1 hr	N-CA-H09	3.1	-0.86	-3.96
10 yr 1 hr	N-CA-H10	3.1	-0.65	-3.75
10 yr 1 hr	N-CA-H10x	3.1	0.85	-2.25
10 yr 1 hr	N-CA-H11	3.12	-0.25	-3.37
10 yr 1 hr	N-CA-H11x	3.1	-0.62	-3.72

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-H12	3.12	-0.23	-3.35
10 yr 1 hr	N-CA-H13	3.24	1.33	-1.91
10 yr 1 hr	N-CA-H14	3.32	1.37	-1.95
10 yr 1 hr	N-CA-I12	3.12	0.63	-2.49
10 yr 1 hr	N-CA-I13	3.12	0.98	-2.14
10 yr 1 hr	N-CA-I14	3.12	1.46	-1.66
10 yr 1 hr	N-CA-J14	3.26	2.29	-0.97
10 yr 1 hr	N-CA-J15x	3.3	2.33	-0.97
10 yr 1 hr	N-CA-K03	3.36	0.66	-2.7
10 yr 1 hr	N-CA-L04	3.38	0.86	-2.52
10 yr 1 hr	N-CA-L05	3.52	1.29	-2.23
10 yr 1 hr	N-CA-M06	3.55	0.95	-2.6
10 yr 1 hr	N-CA-N05	3.57	2.46	-1.11
10 yr 1 hr	N-CA-O08	4.93	4.68	-0.25
10 yr 1 hr	N-CA-S05	3.23	0.01	-3.22
10 yr 1 hr	N-CA-T08	3.06	-1.24	-4.3
10 yr 1 hr	N-CA-T09	3.06	-1.23	-4.29
10 yr 1 hr	N-CB	1.59	1.59	0
10 yr 1 hr	N-CB-A01	3	-3.97	-6.97
10 yr 1 hr	N-CB-A02	#N/A	-3.17	#N/A
10 yr 1 hr	N-CB-Added	#N/A	-6.47	#N/A
10 yr 1 hr	N-CC	1.59	1.59	0
10 yr 1 hr	N-CC-A01	2.81	-1.77	-4.58
10 yr 1 hr	N-CC-A02	2.84	-1.77	-4.61
10 yr 1 hr	N-CC-A03	3.06	-1.82	-4.88
10 yr 1 hr	N-CE	1.59	1.59	0
10 yr 1 hr	N-CE-A01	3.1	0.88	-2.22
10 yr 1 hr	N-CE-A02	3.1	0.88	-2.22
10 yr 1 hr	N-CE-A03	3.1	0.9	-2.2
10 yr 1 hr	N-CF	1.59	1.59	0
10 yr 1 hr	N-CF-A01	3.12	1.76	-1.36
10 yr 1 hr	N-CF-A02	3.12	1.75	-1.37
10 yr 1 hr	N-CF-A03x	3.12	1.76	-1.36
10 yr 1 hr	N-CG	1.59	1.59	0
10 yr 1 hr	N-CG-A01	3.12	2.31	-0.81
10 yr 1 hr	N-CG-A02x	3.12	2.3	-0.82
10 yr 1 hr	N-CG-A03x	3.26	2.48	-0.78
10 yr 1 hr	N-CH	1.59	1.59	0
10 yr 1 hr	N-CH-A01b	1.81	-1.8	-3.61
10 yr 1 hr	N-CH-A02	2.23	-1.6	-3.83
10 yr 1 hr	N-CH-A03	3.64	-0.68	-4.32
10 yr 1 hr	N-CH-A04	3.76	-0.63	-4.39
10 yr 1 hr	N-CH-Added	#N/A	-1.82	#N/A
10 yr 1 hr	N-CH-B02	2.87	-0.21	-3.08

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Area BCDE Improvement Projects Selected Alternative (2BC,3D,1E)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CH-B03	3.84	1.95	-1.89
10 yr 1 hr	N-CH-B03x	2.89	-0.19	-3.08
10 yr 1 hr	N-CH-B04	3.91	2.75	-1.16
10 yr 1 hr	N-CH-B04x	4.04	2.18	-1.86
10 yr 1 hr	N-CH-B05	4.72	3.15	-1.57
10 yr 1 hr	N-CH-B05x	3.99	2.78	-1.21
10 yr 1 hr	N-CH-B06	4.88	4.73	-0.15
10 yr 1 hr	N-CH-B06x	4.82	3.54	-1.28
10 yr 1 hr	N-CH-B07	5.89	5.84	-0.05
10 yr 1 hr	N-CH-C04	3.75	-0.15	-3.9
10 yr 1 hr	N-CH-C05	3.77	0.04	-3.73
10 yr 1 hr	N-CH-C05x1	3.77	-0.11	-3.88
10 yr 1 hr	N-CH-C05x2	3.77	-0.15	-3.92
10 yr 1 hr	N-CH-C05x3	3.77	-0.14	-3.91
10 yr 1 hr	N-CH-C06	3.78	0.09	-3.69
10 yr 1 hr	N-CH-C06x	3.77	0.05	-3.72
10 yr 1 hr	N-CH-C07x	3.77	0.15	-3.62
10 yr 1 hr	N-CH-D05	3.77	-0.09	-3.86
10 yr 1 hr	N-CH-D06	3.77	0.12	-3.65
10 yr 1 hr	N-CH-D08x	3.77	0.35	-3.42
10 yr 1 hr	N-CH-E06	3.78	0.13	-3.65
10 yr 1 hr	N-CH-E07	3.78	0.14	-3.64
10 yr 1 hr	N-CH-F07	3.78	0.2	-3.58
10 yr 1 hr	N-CH-F08	3.78	0.22	-3.56
10 yr 1 hr	N-CH-G07	3.77	0.2	-3.57
10 yr 1 hr	N-CH-G08	3.77	0.34	-3.43
10 yr 1 hr	N-CH-G09	3.77	0.37	-3.4
10 yr 1 hr	N-CH-G10	3.77	0.45	-3.32
10 yr 1 hr	N-CH-G11	3.77	0.46	-3.31
10 yr 1 hr	N-CH-I04	3.73	0.35	-3.38
10 yr 1 hr	N-CH-I05x1	3.76	0.37	-3.39
10 yr 1 hr	N-CH-I05x2	3.76	0.94	-2.82
10 yr 1 hr	N-CH-I05x3	3.76	1.05	-2.71
10 yr 1 hr	N-CH-I05x4	3.76	0.36	-3.4
10 yr 1 hr	N-CI	1.59	1.59	0
10 yr 1 hr	N-D10	3.77	0.37	-3.4
10 yr 1 hr	N-D16	2.53	2.53	0
10 yr 1 hr	N-D19	4.78	4.67	-0.11
10 yr 1 hr	N-D20	4.77	4.44	-0.33
10 yr 1 hr	N-D22	4.79	4.75	-0.04
10 yr 1 hr	N-D30	4.76	4.23	-0.53
10 yr 1 hr	N-DA	1.59	1.59	0
10 yr 1 hr	N-DA-A01	3.36	1.73	-1.63
10 yr 1 hr	N-DB	1.59	1.59	0

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Area BCDE Improvement Projects Selected Alternative (2BC,3D,1E)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DC	1.59	1.59	0
10 yr 1 hr	N-DI-A01	3.51	1.71	-1.8
10 yr 1 hr	N-DI-A02	3.52	1.84	-1.68
10 yr 1 hr	N-DI-B04	4.27	2.15	-2.12
10 yr 1 hr	N-DI-B05	4.03	2.24	-1.79
10 yr 1 hr	N-DI-B05x	4.71	2.16	-2.55
10 yr 1 hr	N-DI-B06	4.04	2.32	-1.72
10 yr 1 hr	N-DI-B07	4.72	2.41	-2.31
10 yr 1 hr	N-DI-B08	4.72	2.53	-2.19
10 yr 1 hr	N-DI-B09	4.73	2.72	-2.01
10 yr 1 hr	N-DI-B10	4.75	2.93	-1.82
10 yr 1 hr	N-DI-B10x	4.73	2.73	-2
10 yr 1 hr	N-DI-B11	4.74	2.93	-1.81
10 yr 1 hr	N-DI-C03	3.55	1.94	-1.61
10 yr 1 hr	N-DI-C04	4.78	4.55	-0.23
10 yr 1 hr	N-DI-C05	4.52	2.83	-1.69
10 yr 1 hr	N-DP	4.17	-1.22	-5.39
10 yr 1 hr	N-DP-A01	4.32	0.71	-3.61
10 yr 1 hr	N-DP-A02	4.36	1.99	-2.37
10 yr 1 hr	N-DP-A04	4.39	3.2	-1.19
10 yr 1 hr	N-DP-A07	4.77	3.36	-1.41
10 yr 1 hr	N-DP-A08	4.77	3.36	-1.41
10 yr 1 hr	N-DP-A09	4.77	3.13	-1.64
10 yr 1 hr	N-DP-A09x	4.77	3.37	-1.4
10 yr 1 hr	N-DP-A10	4.76	3.18	-1.58
10 yr 1 hr	N-DP-A11x	4.76	3.18	-1.58
10 yr 1 hr	N-DP-B2	4.35	1.13	-3.22
10 yr 1 hr	N-DP-C02	4.37	1.53	-2.84
10 yr 1 hr	N-DP-C03	3.36	1.74	-1.62
10 yr 1 hr	N-DP-C03x	4.37	1.54	-2.83
10 yr 1 hr	N-DP-D02	4.43	2.41	-2.02
10 yr 1 hr	N-DP-D03x	4.82	4.73	-0.09
10 yr 1 hr	N-DP-D04	4.59	3.11	-1.48
10 yr 1 hr	N-DP-D05x	4.64	3.47	-1.17
10 yr 1 hr	N-DP-D06x	4.71	3.67	-1.04
10 yr 1 hr	N-DP-D07x	4.81	3.93	-0.88
10 yr 1 hr	N-DP-D08x	4.89	4.09	-0.8
10 yr 1 hr	N-DP-D09	5.01	4.34	-0.67
10 yr 1 hr	N-DP-D10	5.4	5.34	-0.06
10 yr 1 hr	N-DP-E05	4.74	4.11	-0.63
10 yr 1 hr	N-DP-E06	4.86	4.85	-0.01
10 yr 1 hr	N-DP-E08	4.78	4.65	-0.13
10 yr 1 hr	N-DP-F07	5.1	5.01	-0.09
10 yr 1 hr	N-DP-F08	4.94	4.62	-0.32

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DP-F09	4.96	4.95	-0.01
10 yr 1 hr	N-DP-G05	4.36	3.47	-0.89
10 yr 1 hr	N-DP-G06	4.36	2.36	-2
10 yr 1 hr	N-DP-G07	4.36	2.77	-1.59
10 yr 1 hr	N-DP-G07x	4.35	2.36	-1.99
10 yr 1 hr	N-DP-G08	4.39	3.24	-1.15
10 yr 1 hr	N-DP-G08x	4.36	2.77	-1.59
10 yr 1 hr	N-DP-H04	4.36	1.99	-2.37
10 yr 1 hr	N-DP-H05	4.36	2	-2.36
10 yr 1 hr	N-DP-H05x	4.36	3.79	-0.57
10 yr 1 hr	N-DP-H06	4.35	2.24	-2.11
10 yr 1 hr	N-DP-H06x	4.36	4.05	-0.31
10 yr 1 hr	N-DP-K07	4.36	2.25	-2.11
10 yr 1 hr	N-DP-M10	5.11	3.8	-1.31
10 yr 1 hr	N-DP-M11	5.2	3.75	-1.45
10 yr 1 hr	N-DP-M12	5.25	5.14	-0.11
10 yr 1 hr	N-DP-N10	4.89	4.16	-0.73
10 yr 1 hr	N-DP-O10	4.77	3.21	-1.56
10 yr 1 hr	N-DP-O11	4.88	3.35	-1.53
10 yr 1 hr	N-DP-P06	4.6	4.39	-0.21
10 yr 1 hr	N-DP-Y03	5.11	5.11	0
10 yr 1 hr	N-DP-Z12	4.26	4.09	-0.17
10 yr 1 hr	N-DQ-A01	4.33	2.05	-2.28
10 yr 1 hr	N-DQ-A01x	#N/A	2.18	#N/A
10 yr 1 hr	N-DQ-A02	4.34	3.13	-1.21
10 yr 1 hr	N-DQ-A03	4.33	1.96	-2.37
10 yr 1 hr	N-DQ-A03x	2.94	1.64	-1.3
10 yr 1 hr	N-DQ-A04	5.32	5.32	0
10 yr 1 hr	N-DQ-A05	4.03	1.8	-2.23
10 yr 1 hr	N-DQ-A06	4.33	3.37	-0.96
10 yr 1 hr	N-DQ-A07	4.33	3.4	-0.93
10 yr 1 hr	N-DQ-A08	4.33	3.45	-0.88
10 yr 1 hr	N-E01	2.9	2.9	0
10 yr 1 hr	N-E02	3.35	3.35	0
10 yr 1 hr	N-E03	4	4	0
10 yr 1 hr	N-E07	4.49	4.49	0
10 yr 1 hr	N-E08	3.78	3.78	0
10 yr 1 hr	N-E10	3.71	3.71	0
10 yr 1 hr	N-E11	1.83	1.83	0
10 yr 1 hr	N-EA	1.59	1.59	0
10 yr 1 hr	N-EA-A01	3.81	1.82	-1.99
10 yr 1 hr	N-EA-A02	3.81	1.83	-1.98
10 yr 1 hr	N-EB	1.59	1.59	0
10 yr 1 hr	N-EB-A01	2.52	1.67	-0.85

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Area BCDE Improvement Projects Selected Alternative (2BC,3D,1E)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-EC	1.59	1.59	0
10 yr 1 hr	N-EC-A01	2.69	1.67	-1.02
10 yr 1 hr	N-ED	1.59	1.59	0
10 yr 1 hr	N-ED-A01	3.24	1.78	-1.46
10 yr 1 hr	N-ED-A02	3.41	1.95	-1.46
10 yr 1 hr	N-ED-A03	3.51	2.16	-1.35
10 yr 1 hr	N-EE	1.59	1.59	0
10 yr 1 hr	N-EE-A01	3.66	1.97	-1.69
10 yr 1 hr	N-EF	1.59	1.59	0
10 yr 1 hr	N-EF-A01	3.11	1.69	-1.42
10 yr 1 hr	N-EG	1.59	1.59	0
10 yr 1 hr	N-EG-A01	3.43	1.88	-1.55
10 yr 1 hr	N-EG-A02	3.62	1.9	-1.72
10 yr 1 hr	N-EH	1.59	1.59	0
10 yr 1 hr	N-EH-A01	1.77	1.63	-0.14
10 yr 1 hr	N-EI	1.59	1.59	0
10 yr 1 hr	N-EJ	1.59	1.59	0
10 yr 1 hr	N-EJ-A01	1.61	1.61	0
10 yr 1 hr	N-EK	1.59	1.59	0
10 yr 1 hr	N-EK-A01	3.68	3.68	0
10 yr 1 hr	N-EL	1.59	1.59	0
10 yr 1 hr	N-EL-A01	3.01	3.01	0
10 yr 1 hr	N-EM	1.59	1.59	0
10 yr 1 hr	N-EM-A01	2.63	2.63	0
10 yr 1 hr	N-EM-A02	2.61	2.61	0
10 yr 1 hr	N-EM-A03	2	2	0
10 yr 1 hr	N-EN	1.59	1.59	0
10 yr 1 hr	N-EN-A01	2.83	2.34	-0.49
10 yr 1 hr	N-EO	1.59	1.59	0
10 yr 1 hr	N-EO-A01	2.22	2.22	0
10 yr 1 hr	N-EP	1.59	1.59	0
10 yr 1 hr	N-EP-A01	1.98	1.98	0
10 yr 1 hr	N-EQ	1.59	1.59	0
10 yr 1 hr	N-EQ-A01	1.65	1.65	0
10 yr 1 hr	N-ER	1.59	1.59	0
10 yr 1 hr	N-ES	1.59	1.59	0
10 yr 1 hr	N-ET	1.59	1.59	0
10 yr 1 hr	N-ET-A01	1.59	1.59	0
10 yr 1 hr	N-Pump-C3	#N/A	-1.21	#N/A
10 yr 1 hr	Trunkline-Junction-1	#N/A	0.48	#N/A

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Area BCDE Improvement Projects Selected Alternative (2BC,3D,1E)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	9thSt-Node	#N/A	1.41	#N/A
25 yr 72 hr	B-Pump Node	#N/A	-3.68	#N/A
25 yr 72 hr	B-Pump Node 2	#N/A	1.02	#N/A
25 yr 72 hr	N-BA	1.59	1.59	0
25 yr 72 hr	N-BA-A01	3.55	1.54	-2.01
25 yr 72 hr	N-BA-A02	3.6	2.09	-1.51
25 yr 72 hr	N-BA-A03	3.64	2.49	-1.15
25 yr 72 hr	N-BA-A03x	3.6	2.09	-1.51
25 yr 72 hr	N-BA-A04	3.71	2.88	-0.83
25 yr 72 hr	N-BA-A04x	3.63	2.54	-1.09
25 yr 72 hr	N-BA-A05	3.72	3.06	-0.66
25 yr 72 hr	N-BA-A06	3.78	3.18	-0.6
25 yr 72 hr	N-BA-A07	3.82	3.28	-0.54
25 yr 72 hr	N-BA-A07x	3.81	3.21	-0.6
25 yr 72 hr	N-BA-A08	3.83	3.29	-0.54
25 yr 72 hr	N-BA-A08x	3.82	3.31	-0.51
25 yr 72 hr	N-BA-A09	4.01	4.3	0.29
25 yr 72 hr	N-BA-B02	3.41	1.68	-1.73
25 yr 72 hr	N-BA-B03	3.41	1.72	-1.69
25 yr 72 hr	N-BA-B04	3.39	1.73	-1.66
25 yr 72 hr	N-BA-C03	3.57	1.98	-1.59
25 yr 72 hr	N-BA-C04	3.57	1.6	-1.97
25 yr 72 hr	N-BA-D05	3.73	2.93	-0.8
25 yr 72 hr	N-BA-D06	3.75	3.12	-0.63
25 yr 72 hr	N-BA-D07	3.85	3.46	-0.39
25 yr 72 hr	N-BA-D08	3.89	3.49	-0.4
25 yr 72 hr	N-BA-E09	3.83	3.3	-0.53
25 yr 72 hr	N-BA-F09	3.88	3.32	-0.56
25 yr 72 hr	N-BA-K04	3.69	3.03	-0.66
25 yr 72 hr	N-BA-K05	3.72	3.44	-0.28
25 yr 72 hr	N-BA-K06	3.78	3.73	-0.05
25 yr 72 hr	N-BA-K08	5.08	5.08	0
25 yr 72 hr	N-BA-L06	3.76	3.63	-0.13
25 yr 72 hr	N-BA-Q05	3.67	1.63	-2.04
25 yr 72 hr	N-BA-Q06	3.66	1.72	-1.94
25 yr 72 hr	N-BA-Q06x	3.67	1.49	-2.18
25 yr 72 hr	N-BA-Q07	3.68	1.84	-1.84
25 yr 72 hr	N-BA-Q07x	3.66	1.72	-1.94
25 yr 72 hr	N-BA-Q08	3.68	1.9	-1.78
25 yr 72 hr	N-BA-R06	3.69	2.94	-0.75
25 yr 72 hr	N-BA-R07	3.68	1.94	-1.74
25 yr 72 hr	N-BA-R07x	3.7	3.16	-0.54
25 yr 72 hr	N-BA-R08	3.66	1.21	-2.45
25 yr 72 hr	N-BA-R08x	3.68	1.94	-1.74

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA-R09	3.67	1.25	-2.42
25 yr 72 hr	N-BA-R10	3.67	1.25	-2.42
25 yr 72 hr	N-BA-R11	3.65	1.26	-2.39
25 yr 72 hr	N-BA-S06a	3.94	3.82	-0.12
25 yr 72 hr	N-BA-T07	3.73	3.29	-0.44
25 yr 72 hr	N-BA-T08	3.72	3.29	-0.43
25 yr 72 hr	N-BA-T08x	3.73	3.29	-0.44
25 yr 72 hr	N-BA-T09	3.69	3.27	-0.42
25 yr 72 hr	N-BA-T09x	3.71	3.29	-0.42
25 yr 72 hr	N-BA-T10	3.69	3.27	-0.42
25 yr 72 hr	N-BA-U02	3.55	1.95	-1.6
25 yr 72 hr	N-BA-U03	3.56	2.08	-1.48
25 yr 72 hr	N-BA-V07	3.8	3.78	-0.02
25 yr 72 hr	N-BA-W08	4.54	4.5	-0.04
25 yr 72 hr	N-BA-W09A	4.55	4.51	-0.04
25 yr 72 hr	N-BA-W09B	4.51	4.47	-0.04
25 yr 72 hr	N-BB	1.59	1.59	0
25 yr 72 hr	N-BB-A01	3.6	1.26	-2.34
25 yr 72 hr	N-BB-A02	3.59	1.26	-2.33
25 yr 72 hr	N-BB-A03	3.57	1.28	-2.29
25 yr 72 hr	N-BB-A04	3.58	1.28	-2.3
25 yr 72 hr	N-BC	1.59	1.59	0
25 yr 72 hr	N-BC-A01	2.54	2.66	0.12
25 yr 72 hr	N-BC-A02	4.82	3.24	-1.58
25 yr 72 hr	N-BD	1.59	1.59	0
25 yr 72 hr	N-BD-A01	3.59	-0.44	-4.03
25 yr 72 hr	N-BD-A02	3.64	1.08	-2.56
25 yr 72 hr	N-BD-A02x	3.65	1.08	-2.57
25 yr 72 hr	N-BD-A03	3.65	1.2	-2.45
25 yr 72 hr	N-BD-A05	3.64	1.46	-2.18
25 yr 72 hr	N-BD-B02	3.59	-0.38	-3.97
25 yr 72 hr	N-BD-B03	3.57	-0.12	-3.69
25 yr 72 hr	N-BD-B04	3.64	2.61	-1.03
25 yr 72 hr	N-BD-B04x	3.57	1.4	-2.17
25 yr 72 hr	N-BE	1.59	1.59	0
25 yr 72 hr	N-BE-A01	3.56	3.03	-0.53
25 yr 72 hr	N-BE-A03	3.68	1.65	-2.03
25 yr 72 hr	N-BE-A04	3.68	1.83	-1.85
25 yr 72 hr	N-BF	1.59	1.59	0
25 yr 72 hr	N-BF-A01	4.06	3.96	-0.1
25 yr 72 hr	N-BG	#N/A	1.59	#N/A
25 yr 72 hr	N-CA	1.59	1.59	0
25 yr 72 hr	N-CA-A01c	5.81	5.09	-0.72
25 yr 72 hr	N-CA-A01d	3.45	1.46	-1.99

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Area BCDE Improvement Projects Selected Alternative (2BC,3D,1E)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-A02	3.58	2.59	-0.99
25 yr 72 hr	N-CA-A03	3.59	2.73	-0.86
25 yr 72 hr	N-CA-A04	3.6	3.05	-0.55
25 yr 72 hr	N-CA-A05	3.6	3.27	-0.33
25 yr 72 hr	N-CA-A07	5.04	4.97	-0.07
25 yr 72 hr	N-CA-B03	3.59	2.88	-0.71
25 yr 72 hr	N-CA-B04	3.6	3.11	-0.49
25 yr 72 hr	N-CA-B07	4.7	4.45	-0.25
25 yr 72 hr	N-CA-C03	3.38	-1.59	-4.97
25 yr 72 hr	N-CA-C04	3.35	-1.59	-4.94
25 yr 72 hr	N-CA-C05	3.39	2.67	-0.72
25 yr 72 hr	N-CA-D06	3.64	3.59	-0.05
25 yr 72 hr	N-CA-D07	3.65	2.22	-1.43
25 yr 72 hr	N-CA-D07x	3.81	3.81	0
25 yr 72 hr	N-CA-D08	3.4	1.67	-1.73
25 yr 72 hr	N-CA-D08x	3.66	2.25	-1.41
25 yr 72 hr	N-CA-D09x	3.4	1.69	-1.71
25 yr 72 hr	N-CA-E07	4.8	4.47	-0.33
25 yr 72 hr	N-CA-E08	4.82	4.47	-0.35
25 yr 72 hr	N-CA-E09x	5.03	4.47	-0.56
25 yr 72 hr	N-CA-F04	3.56	-1.06	-4.62
25 yr 72 hr	N-CA-F05	3.36	-0.86	-4.22
25 yr 72 hr	N-CA-F05x	3.43	-1.07	-4.5
25 yr 72 hr	N-CA-F06	3.35	-1.05	-4.4
25 yr 72 hr	N-CA-F06x	3.33	-0.84	-4.17
25 yr 72 hr	N-CA-F07	3.34	-0.51	-3.85
25 yr 72 hr	N-CA-F07x	3.33	-1.01	-4.34
25 yr 72 hr	N-CA-F08	3.36	-0.14	-3.5
25 yr 72 hr	N-CA-F09	3.36	0	-3.36
25 yr 72 hr	N-CA-F09x	3.36	-0.14	-3.5
25 yr 72 hr	N-CA-F10	3.37	0.22	-3.15
25 yr 72 hr	N-CA-F11	3.37	0.29	-3.08
25 yr 72 hr	N-CA-F11x	3.37	0.26	-3.11
25 yr 72 hr	N-CA-F12	3.37	0.29	-3.08
25 yr 72 hr	N-CA-F12x	3.37	1.1	-2.27
25 yr 72 hr	N-CA-G08	3.37	-0.07	-3.44
25 yr 72 hr	N-CA-G09	3.38	-0.01	-3.39
25 yr 72 hr	N-CA-G10	3.58	0.01	-3.57
25 yr 72 hr	N-CA-G11x	3.56	0.15	-3.41
25 yr 72 hr	N-CA-H09	3.38	0.85	-2.53
25 yr 72 hr	N-CA-H10	3.38	1.1	-2.28
25 yr 72 hr	N-CA-H10x	3.37	1.49	-1.88
25 yr 72 hr	N-CA-H11	3.39	1.59	-1.8
25 yr 72 hr	N-CA-H11x	3.38	1.15	-2.23

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Area BCDE Improvement Projects Selected Alternative (2BC,3D,1E)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-H12	3.39	1.63	-1.76
25 yr 72 hr	N-CA-H13	3.4	1.92	-1.48
25 yr 72 hr	N-CA-H14	3.41	1.97	-1.44
25 yr 72 hr	N-CA-I12	3.39	1.91	-1.48
25 yr 72 hr	N-CA-I13	3.39	2.11	-1.28
25 yr 72 hr	N-CA-I14	3.39	2.31	-1.08
25 yr 72 hr	N-CA-J14	3.4	2.65	-0.75
25 yr 72 hr	N-CA-J15x	3.4	2.69	-0.71
25 yr 72 hr	N-CA-K03	3.62	2.76	-0.86
25 yr 72 hr	N-CA-L04	3.6	3.13	-0.47
25 yr 72 hr	N-CA-L05	3.73	3.59	-0.14
25 yr 72 hr	N-CA-M06	3.77	3.58	-0.19
25 yr 72 hr	N-CA-N05	3.66	3.53	-0.13
25 yr 72 hr	N-CA-O08	4.98	4.96	-0.02
25 yr 72 hr	N-CA-S05	3.41	0.07	-3.34
25 yr 72 hr	N-CA-T08	3.32	-0.48	-3.8
25 yr 72 hr	N-CA-T09	3.32	-0.48	-3.8
25 yr 72 hr	N-CB	1.59	1.59	0
25 yr 72 hr	N-CB-A01	3.19	-3.22	-6.41
25 yr 72 hr	N-CB-A02	#N/A	-2.14	#N/A
25 yr 72 hr	N-CB-Added	#N/A	-6.46	#N/A
25 yr 72 hr	N-CC	1.59	1.59	0
25 yr 72 hr	N-CC-A01	3.15	-1.67	-4.82
25 yr 72 hr	N-CC-A02	3.18	-1.67	-4.85
25 yr 72 hr	N-CC-A03	3.31	-1.73	-5.04
25 yr 72 hr	N-CE	1.59	1.59	0
25 yr 72 hr	N-CE-A01	3.37	1.53	-1.84
25 yr 72 hr	N-CE-A02	3.37	1.52	-1.85
25 yr 72 hr	N-CE-A03	3.37	1.56	-1.81
25 yr 72 hr	N-CF	1.59	1.59	0
25 yr 72 hr	N-CF-A01	3.38	2.47	-0.91
25 yr 72 hr	N-CF-A02	3.38	2.47	-0.91
25 yr 72 hr	N-CF-A03x	3.38	2.47	-0.91
25 yr 72 hr	N-CG	1.59	1.59	0
25 yr 72 hr	N-CG-A01	3.38	2.79	-0.59
25 yr 72 hr	N-CG-A02x	3.39	2.78	-0.61
25 yr 72 hr	N-CG-A03x	3.39	2.95	-0.44
25 yr 72 hr	N-CH	1.59	1.59	0
25 yr 72 hr	N-CH-A01b	1.88	-0.08	-1.96
25 yr 72 hr	N-CH-A02	2.75	0.12	-2.63
25 yr 72 hr	N-CH-A03	3.93	0.57	-3.36
25 yr 72 hr	N-CH-A04	4.03	0.58	-3.45
25 yr 72 hr	N-CH-Added	#N/A	-0.2	#N/A
25 yr 72 hr	N-CH-B02	2.96	0.6	-2.36

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CH-B03	3.9	2.03	-1.87
25 yr 72 hr	N-CH-B03x	3.08	0.61	-2.47
25 yr 72 hr	N-CH-B04	3.94	2.81	-1.13
25 yr 72 hr	N-CH-B04x	4.12	2.28	-1.84
25 yr 72 hr	N-CH-B05	4.75	3.22	-1.53
25 yr 72 hr	N-CH-B05x	4.05	2.84	-1.21
25 yr 72 hr	N-CH-B06	4.88	4.75	-0.13
25 yr 72 hr	N-CH-B06x	4.83	3.62	-1.21
25 yr 72 hr	N-CH-B07	5.93	5.89	-0.04
25 yr 72 hr	N-CH-C04	4.02	0.82	-3.2
25 yr 72 hr	N-CH-C05	4.04	1.03	-3.01
25 yr 72 hr	N-CH-C05x1	4.03	0.84	-3.19
25 yr 72 hr	N-CH-C05x2	4.03	0.82	-3.21
25 yr 72 hr	N-CH-C05x3	4.03	0.82	-3.21
25 yr 72 hr	N-CH-C06	4.04	1.08	-2.96
25 yr 72 hr	N-CH-C06x	4.04	1.04	-3
25 yr 72 hr	N-CH-C07x	4.04	1.13	-2.91
25 yr 72 hr	N-CH-D05	4.03	0.89	-3.14
25 yr 72 hr	N-CH-D06	4.03	1.15	-2.88
25 yr 72 hr	N-CH-D08x	4.04	1.51	-2.53
25 yr 72 hr	N-CH-E06	4.04	1.2	-2.84
25 yr 72 hr	N-CH-E07	4.04	1.2	-2.84
25 yr 72 hr	N-CH-F07	4.05	1.29	-2.76
25 yr 72 hr	N-CH-F08	4.05	1.32	-2.73
25 yr 72 hr	N-CH-G07	4.03	1.2	-2.83
25 yr 72 hr	N-CH-G08	4.03	1.29	-2.74
25 yr 72 hr	N-CH-G09	4.02	1.3	-2.72
25 yr 72 hr	N-CH-G10	4.02	1.43	-2.59
25 yr 72 hr	N-CH-G11	4.03	1.45	-2.58
25 yr 72 hr	N-CH-I04	3.99	1.2	-2.79
25 yr 72 hr	N-CH-I05x1	4.02	1.21	-2.81
25 yr 72 hr	N-CH-I05x2	4.01	1.36	-2.65
25 yr 72 hr	N-CH-I05x3	4.01	1.44	-2.57
25 yr 72 hr	N-CH-I05x4	4.02	1.21	-2.81
25 yr 72 hr	N-CI	1.59	1.59	0
25 yr 72 hr	N-D10	4.03	1.55	-2.48
25 yr 72 hr	N-D16	2.55	2.55	0
25 yr 72 hr	N-D19	4.89	4.7	-0.19
25 yr 72 hr	N-D20	4.89	4.5	-0.39
25 yr 72 hr	N-D22	4.86	4.76	-0.1
25 yr 72 hr	N-D30	4.87	4.25	-0.62
25 yr 72 hr	N-DA	1.59	1.59	0
25 yr 72 hr	N-DA-A01	3.76	1.78	-1.98
25 yr 72 hr	N-DB	1.59	1.59	0

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Area BCDE Improvement Projects Selected Alternative (2BC,3D,1E)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DC	1.59	1.59	0
25 yr 72 hr	N-DI-A01	3.98	1.75	-2.23
25 yr 72 hr	N-DI-A02	4.02	1.92	-2.1
25 yr 72 hr	N-DI-B04	4.51	2.34	-2.17
25 yr 72 hr	N-DI-B05	4.32	2.45	-1.87
25 yr 72 hr	N-DI-B05x	4.83	2.35	-2.48
25 yr 72 hr	N-DI-B06	4.33	2.56	-1.77
25 yr 72 hr	N-DI-B07	4.83	2.69	-2.14
25 yr 72 hr	N-DI-B08	4.83	2.86	-1.97
25 yr 72 hr	N-DI-B09	4.85	3.14	-1.71
25 yr 72 hr	N-DI-B10	4.87	3.38	-1.49
25 yr 72 hr	N-DI-B10x	4.85	3.14	-1.71
25 yr 72 hr	N-DI-B11	4.86	3.38	-1.48
25 yr 72 hr	N-DI-C03	4.09	2.07	-2.02
25 yr 72 hr	N-DI-C04	4.86	4.72	-0.14
25 yr 72 hr	N-DI-C05	4.76	3.46	-1.3
25 yr 72 hr	N-DP	4.39	-0.5	-4.89
25 yr 72 hr	N-DP-A01	4.54	1.42	-3.12
25 yr 72 hr	N-DP-A02	4.59	2.61	-1.98
25 yr 72 hr	N-DP-A04	4.62	3.61	-1.01
25 yr 72 hr	N-DP-A07	4.89	3.97	-0.92
25 yr 72 hr	N-DP-A08	4.89	3.96	-0.93
25 yr 72 hr	N-DP-A09	4.88	3.64	-1.24
25 yr 72 hr	N-DP-A09x	4.89	4	-0.89
25 yr 72 hr	N-DP-A10	4.88	3.72	-1.16
25 yr 72 hr	N-DP-A11x	4.88	3.74	-1.14
25 yr 72 hr	N-DP-B2	4.57	1.85	-2.72
25 yr 72 hr	N-DP-C02	4.59	2.22	-2.37
25 yr 72 hr	N-DP-C03	3.76	1.79	-1.97
25 yr 72 hr	N-DP-C03x	4.59	2.24	-2.35
25 yr 72 hr	N-DP-D02	4.64	3.07	-1.57
25 yr 72 hr	N-DP-D03x	4.87	4.81	-0.06
25 yr 72 hr	N-DP-D04	4.85	3.72	-1.13
25 yr 72 hr	N-DP-D05x	4.88	4.08	-0.8
25 yr 72 hr	N-DP-D06x	4.94	4.42	-0.52
25 yr 72 hr	N-DP-D07x	5.03	4.57	-0.46
25 yr 72 hr	N-DP-D08x	5.1	4.65	-0.45
25 yr 72 hr	N-DP-D09	5.19	4.83	-0.36
25 yr 72 hr	N-DP-D10	5.55	5.52	-0.03
25 yr 72 hr	N-DP-E05	4.89	4.17	-0.72
25 yr 72 hr	N-DP-E06	4.92	4.9	-0.02
25 yr 72 hr	N-DP-E08	4.89	4.69	-0.2
25 yr 72 hr	N-DP-F07	5.89	5.75	-0.14
25 yr 72 hr	N-DP-F08	5.13	4.68	-0.45

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DP-F09	5.37	5.11	-0.26
25 yr 72 hr	N-DP-G05	4.58	3.67	-0.91
25 yr 72 hr	N-DP-G06	4.58	3.08	-1.5
25 yr 72 hr	N-DP-G07	4.58	3.63	-0.95
25 yr 72 hr	N-DP-G07x	4.57	3.08	-1.49
25 yr 72 hr	N-DP-G08	4.62	4.27	-0.35
25 yr 72 hr	N-DP-G08x	4.58	3.63	-0.95
25 yr 72 hr	N-DP-H04	4.58	2.61	-1.97
25 yr 72 hr	N-DP-H05	4.58	2.61	-1.97
25 yr 72 hr	N-DP-H05x	4.58	3.8	-0.78
25 yr 72 hr	N-DP-H06	4.57	2.88	-1.69
25 yr 72 hr	N-DP-H06x	4.58	4.06	-0.52
25 yr 72 hr	N-DP-K07	4.58	2.96	-1.62
25 yr 72 hr	N-DP-M10	5.26	5.04	-0.22
25 yr 72 hr	N-DP-M11	5.31	5	-0.31
25 yr 72 hr	N-DP-M12	5.38	5.29	-0.09
25 yr 72 hr	N-DP-N10	5.12	4.67	-0.45
25 yr 72 hr	N-DP-O10	4.88	3.65	-1.23
25 yr 72 hr	N-DP-O11	4.89	3.76	-1.13
25 yr 72 hr	N-DP-P06	4.64	4.56	-0.08
25 yr 72 hr	N-DP-Y03	5.12	5.12	0
25 yr 72 hr	N-DP-Z12	4.4	4.18	-0.22
25 yr 72 hr	N-DQ-A01	4.55	2.51	-2.04
25 yr 72 hr	N-DQ-A01x	#N/A	2.76	#N/A
25 yr 72 hr	N-DQ-A02	4.56	3.16	-1.4
25 yr 72 hr	N-DQ-A03	4.55	2.34	-2.21
25 yr 72 hr	N-DQ-A03x	3.13	1.7	-1.43
25 yr 72 hr	N-DQ-A04	5.57	5.57	0
25 yr 72 hr	N-DQ-A05	4.36	2.03	-2.33
25 yr 72 hr	N-DQ-A06	4.55	3.38	-1.17
25 yr 72 hr	N-DQ-A07	4.55	3.43	-1.12
25 yr 72 hr	N-DQ-A08	4.55	3.47	-1.08
25 yr 72 hr	N-E01	2.93	2.93	0
25 yr 72 hr	N-E02	3.39	3.39	0
25 yr 72 hr	N-E03	4.02	4.02	0
25 yr 72 hr	N-E07	4.54	4.54	0
25 yr 72 hr	N-E08	3.82	3.82	0
25 yr 72 hr	N-E10	3.74	3.74	0
25 yr 72 hr	N-E11	2.57	2.57	0
25 yr 72 hr	N-EA	1.59	1.59	0
25 yr 72 hr	N-EA-A01	3.86	1.89	-1.97
25 yr 72 hr	N-EA-A02	3.86	1.91	-1.95
25 yr 72 hr	N-EB	1.59	1.59	0
25 yr 72 hr	N-EB-A01	3.03	1.72	-1.31

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-EC	1.59	1.59	0
25 yr 72 hr	N-EC-A01	3.11	1.73	-1.38
25 yr 72 hr	N-ED	1.59	1.59	0
25 yr 72 hr	N-ED-A01	3.63	1.9	-1.73
25 yr 72 hr	N-ED-A02	3.64	2.17	-1.47
25 yr 72 hr	N-ED-A03	3.64	2.51	-1.13
25 yr 72 hr	N-EE	1.59	1.59	0
25 yr 72 hr	N-EE-A01	3.71	2.12	-1.59
25 yr 72 hr	N-EF	1.59	1.59	0
25 yr 72 hr	N-EF-A01	3.71	1.75	-1.96
25 yr 72 hr	N-EG	1.59	1.59	0
25 yr 72 hr	N-EG-A01	3.46	2.07	-1.39
25 yr 72 hr	N-EG-A02	3.66	2.1	-1.56
25 yr 72 hr	N-EH	1.59	1.59	0
25 yr 72 hr	N-EH-A01	2.02	1.67	-0.35
25 yr 72 hr	N-EI	1.59	1.59	0
25 yr 72 hr	N-EJ	1.59	1.59	0
25 yr 72 hr	N-EJ-A01	1.65	1.65	0
25 yr 72 hr	N-EK	1.59	1.59	0
25 yr 72 hr	N-EK-A01	3.76	3.76	0
25 yr 72 hr	N-EL	1.59	1.59	0
25 yr 72 hr	N-EL-A01	3.04	3.04	0
25 yr 72 hr	N-EM	1.59	1.59	0
25 yr 72 hr	N-EM-A01	2.83	2.83	0
25 yr 72 hr	N-EM-A02	2.74	2.74	0
25 yr 72 hr	N-EM-A03	2.57	2.57	0
25 yr 72 hr	N-EN	1.59	1.59	0
25 yr 72 hr	N-EN-A01	2.92	2.44	-0.48
25 yr 72 hr	N-EO	1.59	1.59	0
25 yr 72 hr	N-EO-A01	2.46	2.46	0
25 yr 72 hr	N-EP	1.59	1.59	0
25 yr 72 hr	N-EP-A01	2.56	2.56	0
25 yr 72 hr	N-EQ	1.59	1.59	0
25 yr 72 hr	N-EQ-A01	1.67	1.67	0
25 yr 72 hr	N-ER	1.59	1.59	0
25 yr 72 hr	N-ES	1.59	1.59	0
25 yr 72 hr	N-ET	1.59	1.59	0
25 yr 72 hr	N-ET-A01	1.6	1.6	0
25 yr 72 hr	N-Pump-C3	#N/A	1.4	#N/A
25 yr 72 hr	Trunkline-Junction-1	#N/A	2.69	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	9thSt-Node	#N/A	-1.21	#N/A
10 yr 1 hr	B-Pump Node	#N/A	-3.7	#N/A
10 yr 1 hr	B-Pump Node 2	#N/A	-2.3	#N/A
10 yr 1 hr	N-BA	1.59	1.59	0
10 yr 1 hr	N-BA-A01	3.33	-1.8	-5.13
10 yr 1 hr	N-BA-A02	3.37	-0.61	-3.98
10 yr 1 hr	N-BA-A03	3.4	-0.24	-3.64
10 yr 1 hr	N-BA-A03x	3.37	0.77	-2.6
10 yr 1 hr	N-BA-A04	3.46	-0.01	-3.47
10 yr 1 hr	N-BA-A04x	3.4	1.11	-2.29
10 yr 1 hr	N-BA-A05	3.46	0.1	-3.36
10 yr 1 hr	N-BA-A06	3.58	0.27	-3.31
10 yr 1 hr	N-BA-A07	3.65	0.52	-3.13
10 yr 1 hr	N-BA-A07x	3.61	0.72	-2.89
10 yr 1 hr	N-BA-A08	3.76	0.6	-3.16
10 yr 1 hr	N-BA-A08x	3.65	0.54	-3.11
10 yr 1 hr	N-BA-A09	3.91	3.87	-0.04
10 yr 1 hr	N-BA-B02	3.26	0.9	-2.36
10 yr 1 hr	N-BA-B03	3.26	1.08	-2.18
10 yr 1 hr	N-BA-B04	3.25	1.14	-2.11
10 yr 1 hr	N-BA-C03	3.33	1.66	-1.67
10 yr 1 hr	N-BA-C04	3.32	1.59	-1.73
10 yr 1 hr	N-BA-D05	3.48	-0.01	-3.49
10 yr 1 hr	N-BA-D06	3.49	0.82	-2.67
10 yr 1 hr	N-BA-D07	3.65	1.05	-2.6
10 yr 1 hr	N-BA-D08	3.72	1.05	-2.67
10 yr 1 hr	N-BA-E09	3.76	0.77	-2.99
10 yr 1 hr	N-BA-F09	3.87	2.18	-1.69
10 yr 1 hr	N-BA-K04	3.39	1.97	-1.42
10 yr 1 hr	N-BA-K05	3.41	2.61	-0.8
10 yr 1 hr	N-BA-K06	3.6	2.97	-0.63
10 yr 1 hr	N-BA-K08	5.06	5.04	-0.02
10 yr 1 hr	N-BA-L06	3.54	2.28	-1.26
10 yr 1 hr	N-BA-Q05	3.38	-1.27	-4.65
10 yr 1 hr	N-BA-Q06	3.38	-1.27	-4.65
10 yr 1 hr	N-BA-Q06x	3.38	-1.27	-4.65
10 yr 1 hr	N-BA-Q07	3.38	-1.26	-4.64
10 yr 1 hr	N-BA-Q07x	3.37	-1.24	-4.61
10 yr 1 hr	N-BA-Q08	3.39	-0.3	-3.69
10 yr 1 hr	N-BA-R06	3.39	-1.26	-4.65
10 yr 1 hr	N-BA-R07	3.38	-1.26	-4.64
10 yr 1 hr	N-BA-R07x	3.4	-0.06	-3.46
10 yr 1 hr	N-BA-R08	3.38	-1.29	-4.67
10 yr 1 hr	N-BA-R08x	3.39	-1.12	-4.51

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA-R09	3.38	-1.23	-4.61
10 yr 1 hr	N-BA-R10	3.38	-0.2	-3.58
10 yr 1 hr	N-BA-R11	3.37	-0.19	-3.56
10 yr 1 hr	N-BA-S06a	3.68	2.72	-0.96
10 yr 1 hr	N-BA-T07	3.69	0.65	-3.04
10 yr 1 hr	N-BA-T08	3.68	0.63	-3.05
10 yr 1 hr	N-BA-T08x	3.69	0.69	-3
10 yr 1 hr	N-BA-T09	3.4	0.63	-2.77
10 yr 1 hr	N-BA-T09x	3.68	0.64	-3.04
10 yr 1 hr	N-BA-T10	3.4	0.63	-2.77
10 yr 1 hr	N-BA-U02	3.32	-0.05	-3.37
10 yr 1 hr	N-BA-U03	3.33	-0.04	-3.37
10 yr 1 hr	N-BA-V07	3.75	3.71	-0.04
10 yr 1 hr	N-BA-W08	4.19	4.02	-0.17
10 yr 1 hr	N-BA-W09A	4.2	4.04	-0.16
10 yr 1 hr	N-BA-W09B	4.17	4.01	-0.16
10 yr 1 hr	N-BB	1.59	1.59	0
10 yr 1 hr	N-BB-A01	3.32	-1.06	-4.38
10 yr 1 hr	N-BB-A02	3.33	-1.07	-4.4
10 yr 1 hr	N-BB-A03	3.31	-0.35	-3.66
10 yr 1 hr	N-BB-A04	3.32	-0.34	-3.66
10 yr 1 hr	N-BC	1.59	1.59	0
10 yr 1 hr	N-BC-A01	2.39	2.55	0.16
10 yr 1 hr	N-BC-A02	4.78	3.04	-1.74
10 yr 1 hr	N-BD	1.59	1.59	0
10 yr 1 hr	N-BD-A01	3.33	-2.89	-6.22
10 yr 1 hr	N-BD-A02	3.36	-1.37	-4.73
10 yr 1 hr	N-BD-A02x	3.37	-0.51	-3.88
10 yr 1 hr	N-BD-A03	3.37	-1.31	-4.68
10 yr 1 hr	N-BD-A05	3.37	-1.23	-4.6
10 yr 1 hr	N-BD-B02	3.33	-1.9	-5.23
10 yr 1 hr	N-BD-B03	3.32	-1.36	-4.68
10 yr 1 hr	N-BD-B04	3.32	2.41	-0.91
10 yr 1 hr	N-BD-B04x	3.32	-1.2	-4.52
10 yr 1 hr	N-BE	1.59	1.59	0
10 yr 1 hr	N-BE-A01	3.31	3.03	-0.28
10 yr 1 hr	N-BE-A03	3.39	1.61	-1.78
10 yr 1 hr	N-BE-A04	3.4	1.66	-1.74
10 yr 1 hr	N-BF	1.59	1.59	0
10 yr 1 hr	N-BF-A01	3.9	3.75	-0.15
10 yr 1 hr	N-BG	#N/A	1.59	#N/A
10 yr 1 hr	N-CA	1.59	1.59	0
10 yr 1 hr	N-CA-A01c	5.81	5.09	-0.72
10 yr 1 hr	N-CA-A01d	3.23	-4.09	-7.32

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-A02	3.35	-2.97	-6.32
10 yr 1 hr	N-CA-A03	3.37	-2.12	-5.49
10 yr 1 hr	N-CA-A04	3.4	-0.1	-3.5
10 yr 1 hr	N-CA-A05	3.41	1.43	-1.98
10 yr 1 hr	N-CA-A07	4.72	4.64	-0.08
10 yr 1 hr	N-CA-B03	3.36	1.43	-1.93
10 yr 1 hr	N-CA-B04	3.38	1.43	-1.95
10 yr 1 hr	N-CA-B07	4.35	3.58	-0.77
10 yr 1 hr	N-CA-C03	3.13	-1.72	-4.85
10 yr 1 hr	N-CA-C04	3.11	-1.72	-4.83
10 yr 1 hr	N-CA-C05	3.14	2.65	-0.49
10 yr 1 hr	N-CA-D06	3.62	3.56	-0.06
10 yr 1 hr	N-CA-D07	3.62	1.52	-2.1
10 yr 1 hr	N-CA-D07x	3.79	3.79	0
10 yr 1 hr	N-CA-D08	3.13	-0.99	-4.12
10 yr 1 hr	N-CA-D08x	3.64	1.55	-2.09
10 yr 1 hr	N-CA-D09x	3.13	-0.54	-3.67
10 yr 1 hr	N-CA-E07	4.42	3.74	-0.68
10 yr 1 hr	N-CA-E08	4.43	3.75	-0.68
10 yr 1 hr	N-CA-E09x	4.57	3.77	-0.8
10 yr 1 hr	N-CA-F04	3.37	-3.31	-6.68
10 yr 1 hr	N-CA-F05	3.09	-1.01	-4.1
10 yr 1 hr	N-CA-F05x	3.19	-3.33	-6.52
10 yr 1 hr	N-CA-F06	3.08	-2.16	-5.24
10 yr 1 hr	N-CA-F06x	3.07	-0.99	-4.06
10 yr 1 hr	N-CA-F07	3.08	-2.53	-5.61
10 yr 1 hr	N-CA-F07x	3.07	-1.46	-4.53
10 yr 1 hr	N-CA-F08	3.09	-2.11	-5.2
10 yr 1 hr	N-CA-F09	3.09	-0.56	-3.65
10 yr 1 hr	N-CA-F09x	3.09	-1.28	-4.37
10 yr 1 hr	N-CA-F10	3.1	-0.28	-3.38
10 yr 1 hr	N-CA-F11	3.1	-0.21	-3.31
10 yr 1 hr	N-CA-F11x	3.09	-0.22	-3.31
10 yr 1 hr	N-CA-F12	3.1	-0.21	-3.31
10 yr 1 hr	N-CA-F12x	3.1	0.99	-2.11
10 yr 1 hr	N-CA-G08	3.1	-0.69	-3.79
10 yr 1 hr	N-CA-G09	3.1	-0.65	-3.75
10 yr 1 hr	N-CA-G10	3.39	-0.63	-4.02
10 yr 1 hr	N-CA-G11x	3.37	0.11	-3.26
10 yr 1 hr	N-CA-H09	3.1	-1.53	-4.63
10 yr 1 hr	N-CA-H10	3.1	-1.35	-4.45
10 yr 1 hr	N-CA-H10x	3.1	-0.3	-3.4
10 yr 1 hr	N-CA-H11	3.12	-1.03	-4.15
10 yr 1 hr	N-CA-H11x	3.1	-0.72	-3.82

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-H12	3.12	-1.01	-4.13
10 yr 1 hr	N-CA-H13	3.24	1.27	-1.97
10 yr 1 hr	N-CA-H14	3.32	1.31	-2.01
10 yr 1 hr	N-CA-I12	3.12	-0.03	-3.15
10 yr 1 hr	N-CA-I13	3.12	0.11	-3.01
10 yr 1 hr	N-CA-I14	3.12	0.26	-2.86
10 yr 1 hr	N-CA-J14	3.26	2.18	-1.08
10 yr 1 hr	N-CA-J15x	3.3	2.23	-1.07
10 yr 1 hr	N-CA-K03	3.36	0.66	-2.7
10 yr 1 hr	N-CA-L04	3.38	0.86	-2.52
10 yr 1 hr	N-CA-L05	3.52	1.29	-2.23
10 yr 1 hr	N-CA-M06	3.55	0.95	-2.6
10 yr 1 hr	N-CA-N05	3.57	2.46	-1.11
10 yr 1 hr	N-CA-O08	4.93	4.68	-0.25
10 yr 1 hr	N-CA-S05	3.23	0.01	-3.22
10 yr 1 hr	N-CA-T08	3.06	-1.24	-4.3
10 yr 1 hr	N-CA-T09	3.06	-1.23	-4.29
10 yr 1 hr	N-CB	1.59	1.59	0
10 yr 1 hr	N-CB-A01	3	-4.52	-7.52
10 yr 1 hr	N-CB-A02	#N/A	-3.9	#N/A
10 yr 1 hr	N-CB-Added	#N/A	-6.48	#N/A
10 yr 1 hr	N-CC	1.59	1.59	0
10 yr 1 hr	N-CC-A01	2.81	-1.77	-4.58
10 yr 1 hr	N-CC-A02	2.84	-1.77	-4.61
10 yr 1 hr	N-CC-A03	3.06	-1.82	-4.88
10 yr 1 hr	N-CE	1.59	1.59	0
10 yr 1 hr	N-CE-A01	3.1	1.64	-1.46
10 yr 1 hr	N-CE-A02	3.1	1.65	-1.45
10 yr 1 hr	N-CE-A03	3.1	1.68	-1.42
10 yr 1 hr	N-CF	1.59	1.59	0
10 yr 1 hr	N-CF-A01	3.12	0.34	-2.78
10 yr 1 hr	N-CF-A02	3.12	0.34	-2.78
10 yr 1 hr	N-CF-A03x	3.12	0.34	-2.78
10 yr 1 hr	N-CG	1.59	1.59	0
10 yr 1 hr	N-CG-A01	3.12	2.63	-0.49
10 yr 1 hr	N-CG-A02x	3.12	2.83	-0.29
10 yr 1 hr	N-CG-A03x	3.26	2.99	-0.27
10 yr 1 hr	N-CH	1.59	1.59	0
10 yr 1 hr	N-CH-A01b	1.81	-1.8	-3.61
10 yr 1 hr	N-CH-A02	2.23	-1.6	-3.83
10 yr 1 hr	N-CH-A03	3.64	-0.68	-4.32
10 yr 1 hr	N-CH-A04	3.76	-0.63	-4.39
10 yr 1 hr	N-CH-Added	#N/A	-1.82	#N/A
10 yr 1 hr	N-CH-B02	2.87	-0.21	-3.08

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CH-B03	3.84	1.95	-1.89
10 yr 1 hr	N-CH-B03x	2.89	-0.19	-3.08
10 yr 1 hr	N-CH-B04	3.91	2.75	-1.16
10 yr 1 hr	N-CH-B04x	4.04	2.18	-1.86
10 yr 1 hr	N-CH-B05	4.72	3.15	-1.57
10 yr 1 hr	N-CH-B05x	3.99	2.78	-1.21
10 yr 1 hr	N-CH-B06	4.88	4.73	-0.15
10 yr 1 hr	N-CH-B06x	4.82	3.54	-1.28
10 yr 1 hr	N-CH-B07	5.89	5.84	-0.05
10 yr 1 hr	N-CH-C04	3.75	-0.15	-3.9
10 yr 1 hr	N-CH-C05	3.77	0.04	-3.73
10 yr 1 hr	N-CH-C05x1	3.77	-0.11	-3.88
10 yr 1 hr	N-CH-C05x2	3.77	-0.15	-3.92
10 yr 1 hr	N-CH-C05x3	3.77	-0.14	-3.91
10 yr 1 hr	N-CH-C06	3.78	0.09	-3.69
10 yr 1 hr	N-CH-C06x	3.77	0.05	-3.72
10 yr 1 hr	N-CH-C07x	3.77	0.15	-3.62
10 yr 1 hr	N-CH-D05	3.77	-0.09	-3.86
10 yr 1 hr	N-CH-D06	3.77	0.12	-3.65
10 yr 1 hr	N-CH-D08x	3.77	0.35	-3.42
10 yr 1 hr	N-CH-E06	3.78	0.13	-3.65
10 yr 1 hr	N-CH-E07	3.78	0.14	-3.64
10 yr 1 hr	N-CH-F07	3.78	0.2	-3.58
10 yr 1 hr	N-CH-F08	3.78	0.22	-3.56
10 yr 1 hr	N-CH-G07	3.77	0.2	-3.57
10 yr 1 hr	N-CH-G08	3.77	0.34	-3.43
10 yr 1 hr	N-CH-G09	3.77	0.37	-3.4
10 yr 1 hr	N-CH-G10	3.77	0.45	-3.32
10 yr 1 hr	N-CH-G11	3.77	0.46	-3.31
10 yr 1 hr	N-CH-I04	3.73	0.35	-3.38
10 yr 1 hr	N-CH-I05x1	3.76	0.37	-3.39
10 yr 1 hr	N-CH-I05x2	3.76	0.94	-2.82
10 yr 1 hr	N-CH-I05x3	3.76	1.05	-2.71
10 yr 1 hr	N-CH-I05x4	3.76	0.36	-3.4
10 yr 1 hr	N-CI	1.59	1.59	0
10 yr 1 hr	N-D10	3.77	0.37	-3.4
10 yr 1 hr	N-D16	2.53	2.53	0
10 yr 1 hr	N-D19	4.78	4.67	-0.11
10 yr 1 hr	N-D20	4.77	4.44	-0.33
10 yr 1 hr	N-D22	4.79	4.75	-0.04
10 yr 1 hr	N-D30	4.76	4.23	-0.53
10 yr 1 hr	N-DA	1.59	1.59	0
10 yr 1 hr	N-DA-A01	3.36	1.73	-1.63
10 yr 1 hr	N-DB	1.59	1.59	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DC	1.59	1.59	0
10 yr 1 hr	N-DI-A01	3.51	1.71	-1.8
10 yr 1 hr	N-DI-A02	3.52	1.84	-1.68
10 yr 1 hr	N-DI-B04	4.27	2.15	-2.12
10 yr 1 hr	N-DI-B05	4.03	2.24	-1.79
10 yr 1 hr	N-DI-B05x	4.71	2.16	-2.55
10 yr 1 hr	N-DI-B06	4.04	2.32	-1.72
10 yr 1 hr	N-DI-B07	4.72	2.41	-2.31
10 yr 1 hr	N-DI-B08	4.72	2.53	-2.19
10 yr 1 hr	N-DI-B09	4.73	2.72	-2.01
10 yr 1 hr	N-DI-B10	4.75	2.93	-1.82
10 yr 1 hr	N-DI-B10x	4.73	2.73	-2
10 yr 1 hr	N-DI-B11	4.74	2.93	-1.81
10 yr 1 hr	N-DI-C03	3.55	1.94	-1.61
10 yr 1 hr	N-DI-C04	4.78	2.81	-1.97
10 yr 1 hr	N-DI-C05	4.52	-0.48	-5
10 yr 1 hr	N-DP	4.17	-5.08	-9.25
10 yr 1 hr	N-DP-A01	4.32	-2.82	-7.14
10 yr 1 hr	N-DP-A02	4.36	-2.32	-6.68
10 yr 1 hr	N-DP-A04	4.39	-0.32	-4.71
10 yr 1 hr	N-DP-A07	4.77	3.36	-1.41
10 yr 1 hr	N-DP-A08	4.77	3.36	-1.41
10 yr 1 hr	N-DP-A09	4.77	3.13	-1.64
10 yr 1 hr	N-DP-A09x	4.77	3.37	-1.4
10 yr 1 hr	N-DP-A10	4.76	3.18	-1.58
10 yr 1 hr	N-DP-A11x	4.76	3.18	-1.58
10 yr 1 hr	N-DP-B2	4.35	-2.51	-6.86
10 yr 1 hr	N-DP-C02	4.37	-1.48	-5.85
10 yr 1 hr	N-DP-C03	3.36	1.74	-1.62
10 yr 1 hr	N-DP-C03x	4.37	0.87	-3.5
10 yr 1 hr	N-DP-D02	4.43	-0.77	-5.2
10 yr 1 hr	N-DP-D03x	4.82	4.63	-0.19
10 yr 1 hr	N-DP-D04	4.59	-0.3	-4.89
10 yr 1 hr	N-DP-D05x	4.64	-0.09	-4.73
10 yr 1 hr	N-DP-D06x	4.71	0.11	-4.6
10 yr 1 hr	N-DP-D07x	4.81	0.37	-4.44
10 yr 1 hr	N-DP-D08x	4.89	0.57	-4.32
10 yr 1 hr	N-DP-D09	5.01	1.43	-3.58
10 yr 1 hr	N-DP-D10	5.4	5.32	-0.08
10 yr 1 hr	N-DP-E05	4.74	4.11	-0.63
10 yr 1 hr	N-DP-E06	4.86	4.85	-0.01
10 yr 1 hr	N-DP-E08	4.78	4.65	-0.13
10 yr 1 hr	N-DP-F07	5.1	5.01	-0.09
10 yr 1 hr	N-DP-F08	4.94	4.62	-0.32

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DP-F09	4.96	4.95	-0.01
10 yr 1 hr	N-DP-G05	4.36	0.05	-4.31
10 yr 1 hr	N-DP-G06	4.36	0.39	-3.97
10 yr 1 hr	N-DP-G07	4.36	0.55	-3.81
10 yr 1 hr	N-DP-G07x	4.35	0.39	-3.96
10 yr 1 hr	N-DP-G08	4.39	0.63	-3.76
10 yr 1 hr	N-DP-G08x	4.36	0.52	-3.84
10 yr 1 hr	N-DP-H04	4.36	-0.78	-5.14
10 yr 1 hr	N-DP-H05	4.36	0.08	-4.28
10 yr 1 hr	N-DP-H05x	4.36	3.79	-0.57
10 yr 1 hr	N-DP-H06	4.35	0.29	-4.06
10 yr 1 hr	N-DP-H06x	4.36	4.05	-0.31
10 yr 1 hr	N-DP-K07	4.36	0.29	-4.07
10 yr 1 hr	N-DP-M10	5.11	1.36	-3.75
10 yr 1 hr	N-DP-M11	5.2	0.76	-4.44
10 yr 1 hr	N-DP-M12	5.25	5.12	-0.13
10 yr 1 hr	N-DP-N10	4.89	0.01	-4.88
10 yr 1 hr	N-DP-O10	4.77	3.21	-1.56
10 yr 1 hr	N-DP-O11	4.88	3.35	-1.53
10 yr 1 hr	N-DP-P06	4.6	2.6	-2
10 yr 1 hr	N-DP-Y03	5.11	5.11	0
10 yr 1 hr	N-DP-Z12	4.26	4.09	-0.17
10 yr 1 hr	N-DQ-A01	4.33	-0.16	-4.49
10 yr 1 hr	N-DQ-A01x	#N/A	0.24	#N/A
10 yr 1 hr	N-DQ-A02	4.34	3.11	-1.23
10 yr 1 hr	N-DQ-A03	4.33	-0.53	-4.86
10 yr 1 hr	N-DQ-A03x	2.94	-4.19	-7.13
10 yr 1 hr	N-DQ-A04	5.32	5.32	0
10 yr 1 hr	N-DQ-A05	4.03	-2.59	-6.62
10 yr 1 hr	N-DQ-A06	4.33	3.36	-0.97
10 yr 1 hr	N-DQ-A07	4.33	3.4	-0.93
10 yr 1 hr	N-DQ-A08	4.33	3.45	-0.88
10 yr 1 hr	N-E01	2.9	2.9	0
10 yr 1 hr	N-E02	3.35	3.35	0
10 yr 1 hr	N-E03	4	4	0
10 yr 1 hr	N-E07	4.49	4.49	0
10 yr 1 hr	N-E08	3.78	3.78	0
10 yr 1 hr	N-E10	3.71	3.71	0
10 yr 1 hr	N-E11	1.83	1.83	0
10 yr 1 hr	N-EA	1.59	1.59	0
10 yr 1 hr	N-EA-A01	3.81	3.81	0
10 yr 1 hr	N-EA-A02	3.81	3.81	0
10 yr 1 hr	N-EB	1.59	1.59	0
10 yr 1 hr	N-EB-A01	2.52	2.52	0

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Area BCD Improvement Projects Unselected Alternative (2BCD)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-EC	1.59	1.59	0
10 yr 1 hr	N-EC-A01	2.69	2.69	0
10 yr 1 hr	N-ED	1.59	1.59	0
10 yr 1 hr	N-ED-A01	3.24	3.24	0
10 yr 1 hr	N-ED-A02	3.41	3.41	0
10 yr 1 hr	N-ED-A03	3.51	3.51	0
10 yr 1 hr	N-EE	1.59	1.59	0
10 yr 1 hr	N-EE-A01	3.66	3.66	0
10 yr 1 hr	N-EF	1.59	1.59	0
10 yr 1 hr	N-EF-A01	3.11	3.11	0
10 yr 1 hr	N-EG	1.59	1.59	0
10 yr 1 hr	N-EG-A01	3.43	3.43	0
10 yr 1 hr	N-EG-A02	3.62	3.62	0
10 yr 1 hr	N-EH	1.59	1.59	0
10 yr 1 hr	N-EH-A01	1.77	1.77	0
10 yr 1 hr	N-EI	1.59	1.59	0
10 yr 1 hr	N-EJ	1.59	1.59	0
10 yr 1 hr	N-EJ-A01	1.61	1.61	0
10 yr 1 hr	N-EK	1.59	1.59	0
10 yr 1 hr	N-EK-A01	3.68	3.68	0
10 yr 1 hr	N-EL	1.59	1.59	0
10 yr 1 hr	N-EL-A01	3.01	3.01	0
10 yr 1 hr	N-EM	1.59	1.59	0
10 yr 1 hr	N-EM-A01	2.63	2.63	0
10 yr 1 hr	N-EM-A02	2.61	2.61	0
10 yr 1 hr	N-EM-A03	2	2	0
10 yr 1 hr	N-EN	1.59	1.59	0
10 yr 1 hr	N-EN-A01	2.83	2.83	0
10 yr 1 hr	N-EO	1.59	1.59	0
10 yr 1 hr	N-EO-A01	2.22	2.22	0
10 yr 1 hr	N-EP	1.59	1.59	0
10 yr 1 hr	N-EP-A01	1.98	1.98	0
10 yr 1 hr	N-EQ	1.59	1.59	0
10 yr 1 hr	N-EQ-A01	1.65	1.65	0
10 yr 1 hr	N-ER	1.59	1.59	0
10 yr 1 hr	N-ES	1.59	1.59	0
10 yr 1 hr	N-ET	1.59	1.59	0
10 yr 1 hr	N-ET-A01	1.59	1.59	0
10 yr 1 hr	N-Pump-C3	#N/A	-1.21	#N/A
10 yr 1 hr	Trunkline-Junction-1	#N/A	0.48	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	9thSt-Node	#N/A	1.41	#N/A
25 yr 72 hr	B-Pump Node	#N/A	-3.67	#N/A
25 yr 72 hr	B-Pump Node 2	#N/A	0.2	#N/A
25 yr 72 hr	N-BA	1.59	1.59	0
25 yr 72 hr	N-BA-A01	3.55	0.73	-2.82
25 yr 72 hr	N-BA-A02	3.6	1.33	-2.27
25 yr 72 hr	N-BA-A03	3.64	1.75	-1.89
25 yr 72 hr	N-BA-A03x	3.6	1.33	-2.27
25 yr 72 hr	N-BA-A04	3.71	2.09	-1.62
25 yr 72 hr	N-BA-A04x	3.63	1.76	-1.87
25 yr 72 hr	N-BA-A05	3.72	2.3	-1.42
25 yr 72 hr	N-BA-A06	3.78	2.45	-1.33
25 yr 72 hr	N-BA-A07	3.82	2.63	-1.19
25 yr 72 hr	N-BA-A07x	3.81	2.46	-1.35
25 yr 72 hr	N-BA-A08	3.83	2.65	-1.18
25 yr 72 hr	N-BA-A08x	3.82	2.95	-0.87
25 yr 72 hr	N-BA-A09	4.01	4.3	0.29
25 yr 72 hr	N-BA-B02	3.41	1.05	-2.36
25 yr 72 hr	N-BA-B03	3.41	1.25	-2.16
25 yr 72 hr	N-BA-B04	3.39	1.33	-2.06
25 yr 72 hr	N-BA-C03	3.57	1.67	-1.9
25 yr 72 hr	N-BA-C04	3.57	1.6	-1.97
25 yr 72 hr	N-BA-D05	3.73	2.11	-1.62
25 yr 72 hr	N-BA-D06	3.75	2.73	-1.02
25 yr 72 hr	N-BA-D07	3.85	3.27	-0.58
25 yr 72 hr	N-BA-D08	3.89	3.29	-0.6
25 yr 72 hr	N-BA-E09	3.83	2.73	-1.1
25 yr 72 hr	N-BA-F09	3.88	2.68	-1.2
25 yr 72 hr	N-BA-K04	3.69	3.03	-0.66
25 yr 72 hr	N-BA-K05	3.72	3.44	-0.28
25 yr 72 hr	N-BA-K06	3.78	3.73	-0.05
25 yr 72 hr	N-BA-K08	5.08	5.08	0
25 yr 72 hr	N-BA-L06	3.76	3.63	-0.13
25 yr 72 hr	N-BA-Q05	3.67	1.63	-2.04
25 yr 72 hr	N-BA-Q06	3.66	1.72	-1.94
25 yr 72 hr	N-BA-Q06x	3.67	1.49	-2.18
25 yr 72 hr	N-BA-Q07	3.68	1.84	-1.84
25 yr 72 hr	N-BA-Q07x	3.66	1.72	-1.94
25 yr 72 hr	N-BA-Q08	3.68	1.9	-1.78
25 yr 72 hr	N-BA-R06	3.69	2.94	-0.75
25 yr 72 hr	N-BA-R07	3.68	1.94	-1.74
25 yr 72 hr	N-BA-R07x	3.7	3.16	-0.54
25 yr 72 hr	N-BA-R08	3.66	1.21	-2.45
25 yr 72 hr	N-BA-R08x	3.68	1.94	-1.74

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Area BCD Improvement Projects Unselected Alternative (2BCD)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA-R09	3.67	1.25	-2.42
25 yr 72 hr	N-BA-R10	3.67	1.25	-2.42
25 yr 72 hr	N-BA-R11	3.65	1.26	-2.39
25 yr 72 hr	N-BA-S06a	3.94	3.82	-0.12
25 yr 72 hr	N-BA-T07	3.73	2.66	-1.07
25 yr 72 hr	N-BA-T08	3.72	2.66	-1.06
25 yr 72 hr	N-BA-T08x	3.73	2.67	-1.06
25 yr 72 hr	N-BA-T09	3.69	2.66	-1.03
25 yr 72 hr	N-BA-T09x	3.71	2.66	-1.05
25 yr 72 hr	N-BA-T10	3.69	2.66	-1.03
25 yr 72 hr	N-BA-U02	3.55	1.23	-2.32
25 yr 72 hr	N-BA-U03	3.56	1.32	-2.24
25 yr 72 hr	N-BA-V07	3.8	3.78	-0.02
25 yr 72 hr	N-BA-W08	4.54	4.5	-0.04
25 yr 72 hr	N-BA-W09A	4.55	4.51	-0.04
25 yr 72 hr	N-BA-W09B	4.51	4.47	-0.04
25 yr 72 hr	N-BB	1.59	1.59	0
25 yr 72 hr	N-BB-A01	3.6	1.26	-2.34
25 yr 72 hr	N-BB-A02	3.59	1.26	-2.33
25 yr 72 hr	N-BB-A03	3.57	1.28	-2.29
25 yr 72 hr	N-BB-A04	3.58	1.28	-2.3
25 yr 72 hr	N-BC	1.59	1.59	0
25 yr 72 hr	N-BC-A01	2.54	2.66	0.12
25 yr 72 hr	N-BC-A02	4.82	3.24	-1.58
25 yr 72 hr	N-BD	1.59	1.59	0
25 yr 72 hr	N-BD-A01	3.59	-0.44	-4.03
25 yr 72 hr	N-BD-A02	3.64	1.08	-2.56
25 yr 72 hr	N-BD-A02x	3.65	1.08	-2.57
25 yr 72 hr	N-BD-A03	3.65	1.2	-2.45
25 yr 72 hr	N-BD-A05	3.64	1.46	-2.18
25 yr 72 hr	N-BD-B02	3.59	-0.38	-3.97
25 yr 72 hr	N-BD-B03	3.57	-0.12	-3.69
25 yr 72 hr	N-BD-B04	3.64	2.61	-1.03
25 yr 72 hr	N-BD-B04x	3.57	1.4	-2.17
25 yr 72 hr	N-BE	1.59	1.59	0
25 yr 72 hr	N-BE-A01	3.56	3.03	-0.53
25 yr 72 hr	N-BE-A03	3.68	1.61	-2.07
25 yr 72 hr	N-BE-A04	3.68	1.67	-2.01
25 yr 72 hr	N-BF	1.59	1.59	0
25 yr 72 hr	N-BF-A01	4.06	3.92	-0.14
25 yr 72 hr	N-BG	#N/A	1.59	#N/A
25 yr 72 hr	N-CA	1.59	1.59	0
25 yr 72 hr	N-CA-A01c	5.81	5.09	-0.72
25 yr 72 hr	N-CA-A01d	3.45	1.46	-1.99

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-A02	3.58	2.58	-1
25 yr 72 hr	N-CA-A03	3.59	2.73	-0.86
25 yr 72 hr	N-CA-A04	3.6	3.04	-0.56
25 yr 72 hr	N-CA-A05	3.6	3.27	-0.33
25 yr 72 hr	N-CA-A07	5.04	4.97	-0.07
25 yr 72 hr	N-CA-B03	3.59	2.88	-0.71
25 yr 72 hr	N-CA-B04	3.6	3.11	-0.49
25 yr 72 hr	N-CA-B07	4.7	4.45	-0.25
25 yr 72 hr	N-CA-C03	3.38	-0.4	-3.78
25 yr 72 hr	N-CA-C04	3.35	-0.4	-3.75
25 yr 72 hr	N-CA-C05	3.39	2.67	-0.72
25 yr 72 hr	N-CA-D06	3.64	3.59	-0.05
25 yr 72 hr	N-CA-D07	3.65	2.47	-1.18
25 yr 72 hr	N-CA-D07x	3.81	3.81	0
25 yr 72 hr	N-CA-D08	3.4	1.95	-1.45
25 yr 72 hr	N-CA-D08x	3.66	2.5	-1.16
25 yr 72 hr	N-CA-D09x	3.4	1.97	-1.43
25 yr 72 hr	N-CA-E07	4.8	4.47	-0.33
25 yr 72 hr	N-CA-E08	4.82	4.47	-0.35
25 yr 72 hr	N-CA-E09x	5.03	4.47	-0.56
25 yr 72 hr	N-CA-F04	3.56	0.19	-3.37
25 yr 72 hr	N-CA-F05	3.36	0.24	-3.12
25 yr 72 hr	N-CA-F05x	3.43	0.18	-3.25
25 yr 72 hr	N-CA-F06	3.35	0.19	-3.16
25 yr 72 hr	N-CA-F06x	3.33	0.25	-3.08
25 yr 72 hr	N-CA-F07	3.34	0.85	-2.49
25 yr 72 hr	N-CA-F07x	3.33	0.22	-3.11
25 yr 72 hr	N-CA-F08	3.36	1.23	-2.13
25 yr 72 hr	N-CA-F09	3.36	1.37	-1.99
25 yr 72 hr	N-CA-F09x	3.36	1.23	-2.13
25 yr 72 hr	N-CA-F10	3.37	1.55	-1.82
25 yr 72 hr	N-CA-F11	3.37	1.62	-1.75
25 yr 72 hr	N-CA-F11x	3.37	1.59	-1.78
25 yr 72 hr	N-CA-F12	3.37	1.62	-1.75
25 yr 72 hr	N-CA-F12x	3.37	1.65	-1.72
25 yr 72 hr	N-CA-G08	3.37	1.21	-2.16
25 yr 72 hr	N-CA-G09	3.38	1.27	-2.11
25 yr 72 hr	N-CA-G10	3.58	1.29	-2.29
25 yr 72 hr	N-CA-G11x	3.56	1.29	-2.27
25 yr 72 hr	N-CA-H09	3.38	1.58	-1.8
25 yr 72 hr	N-CA-H10	3.38	1.69	-1.69
25 yr 72 hr	N-CA-H10x	3.37	1.65	-1.72
25 yr 72 hr	N-CA-H11	3.39	1.88	-1.51
25 yr 72 hr	N-CA-H11x	3.38	1.74	-1.64

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-H12	3.39	1.9	-1.49
25 yr 72 hr	N-CA-H13	3.4	2.05	-1.35
25 yr 72 hr	N-CA-H14	3.41	2.09	-1.32
25 yr 72 hr	N-CA-I12	3.39	1.89	-1.5
25 yr 72 hr	N-CA-I13	3.39	1.9	-1.49
25 yr 72 hr	N-CA-I14	3.39	1.9	-1.49
25 yr 72 hr	N-CA-J14	3.4	2.25	-1.15
25 yr 72 hr	N-CA-J15x	3.4	2.3	-1.1
25 yr 72 hr	N-CA-K03	3.62	2.76	-0.86
25 yr 72 hr	N-CA-L04	3.6	3.13	-0.47
25 yr 72 hr	N-CA-L05	3.73	3.59	-0.14
25 yr 72 hr	N-CA-M06	3.77	3.58	-0.19
25 yr 72 hr	N-CA-N05	3.66	3.53	-0.13
25 yr 72 hr	N-CA-O08	4.98	4.96	-0.02
25 yr 72 hr	N-CA-S05	3.41	0.23	-3.18
25 yr 72 hr	N-CA-T08	3.32	0.87	-2.45
25 yr 72 hr	N-CA-T09	3.32	0.88	-2.44
25 yr 72 hr	N-CB	1.59	1.59	0
25 yr 72 hr	N-CB-A01	3.19	-1.05	-4.24
25 yr 72 hr	N-CB-A02	#N/A	-0.42	#N/A
25 yr 72 hr	N-CB-Added	#N/A	-1.49	#N/A
25 yr 72 hr	N-CC	1.59	1.59	0
25 yr 72 hr	N-CC-A01	3.15	-0.4	-3.55
25 yr 72 hr	N-CC-A02	3.18	-0.4	-3.58
25 yr 72 hr	N-CC-A03	3.31	-0.41	-3.72
25 yr 72 hr	N-CE	1.59	1.59	0
25 yr 72 hr	N-CE-A01	3.37	1.67	-1.7
25 yr 72 hr	N-CE-A02	3.37	1.68	-1.69
25 yr 72 hr	N-CE-A03	3.37	1.73	-1.64
25 yr 72 hr	N-CF	1.59	1.59	0
25 yr 72 hr	N-CF-A01	3.38	1.81	-1.57
25 yr 72 hr	N-CF-A02	3.38	1.88	-1.5
25 yr 72 hr	N-CF-A03x	3.38	1.89	-1.49
25 yr 72 hr	N-CG	1.59	1.59	0
25 yr 72 hr	N-CG-A01	3.38	2.73	-0.65
25 yr 72 hr	N-CG-A02x	3.39	2.92	-0.47
25 yr 72 hr	N-CG-A03x	3.39	3.11	-0.28
25 yr 72 hr	N-CH	1.59	1.59	0
25 yr 72 hr	N-CH-A01b	1.88	-0.08	-1.96
25 yr 72 hr	N-CH-A02	2.75	0.12	-2.63
25 yr 72 hr	N-CH-A03	3.93	0.57	-3.36
25 yr 72 hr	N-CH-A04	4.03	0.58	-3.45
25 yr 72 hr	N-CH-Added	#N/A	-0.2	#N/A
25 yr 72 hr	N-CH-B02	2.96	0.6	-2.36

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CH-B03	3.9	2.03	-1.87
25 yr 72 hr	N-CH-B03x	3.08	0.61	-2.47
25 yr 72 hr	N-CH-B04	3.94	2.81	-1.13
25 yr 72 hr	N-CH-B04x	4.12	2.28	-1.84
25 yr 72 hr	N-CH-B05	4.75	3.22	-1.53
25 yr 72 hr	N-CH-B05x	4.05	2.84	-1.21
25 yr 72 hr	N-CH-B06	4.88	4.75	-0.13
25 yr 72 hr	N-CH-B06x	4.83	3.62	-1.21
25 yr 72 hr	N-CH-B07	5.93	5.89	-0.04
25 yr 72 hr	N-CH-C04	4.02	0.82	-3.2
25 yr 72 hr	N-CH-C05	4.04	1.03	-3.01
25 yr 72 hr	N-CH-C05x1	4.03	0.84	-3.19
25 yr 72 hr	N-CH-C05x2	4.03	0.82	-3.21
25 yr 72 hr	N-CH-C05x3	4.03	0.82	-3.21
25 yr 72 hr	N-CH-C06	4.04	1.07	-2.97
25 yr 72 hr	N-CH-C06x	4.04	1.04	-3
25 yr 72 hr	N-CH-C07x	4.04	1.13	-2.91
25 yr 72 hr	N-CH-D05	4.03	0.89	-3.14
25 yr 72 hr	N-CH-D06	4.03	1.15	-2.88
25 yr 72 hr	N-CH-D08x	4.04	1.51	-2.53
25 yr 72 hr	N-CH-E06	4.04	1.19	-2.85
25 yr 72 hr	N-CH-E07	4.04	1.2	-2.84
25 yr 72 hr	N-CH-F07	4.05	1.28	-2.77
25 yr 72 hr	N-CH-F08	4.05	1.32	-2.73
25 yr 72 hr	N-CH-G07	4.03	1.2	-2.83
25 yr 72 hr	N-CH-G08	4.03	1.28	-2.75
25 yr 72 hr	N-CH-G09	4.02	1.3	-2.72
25 yr 72 hr	N-CH-G10	4.02	1.43	-2.59
25 yr 72 hr	N-CH-G11	4.03	1.45	-2.58
25 yr 72 hr	N-CH-I04	3.99	1.2	-2.79
25 yr 72 hr	N-CH-I05x1	4.02	1.21	-2.81
25 yr 72 hr	N-CH-I05x2	4.01	1.36	-2.65
25 yr 72 hr	N-CH-I05x3	4.01	1.43	-2.58
25 yr 72 hr	N-CH-I05x4	4.02	1.2	-2.82
25 yr 72 hr	N-CI	1.59	1.59	0
25 yr 72 hr	N-D10	4.03	1.55	-2.48
25 yr 72 hr	N-D16	2.55	2.55	0
25 yr 72 hr	N-D19	4.89	4.7	-0.19
25 yr 72 hr	N-D20	4.89	4.5	-0.39
25 yr 72 hr	N-D22	4.86	4.76	-0.1
25 yr 72 hr	N-D30	4.87	4.25	-0.62
25 yr 72 hr	N-DA	1.59	1.59	0
25 yr 72 hr	N-DA-A01	3.76	1.78	-1.98
25 yr 72 hr	N-DB	1.59	1.59	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DC	1.59	1.59	0
25 yr 72 hr	N-DI-A01	3.98	1.75	-2.23
25 yr 72 hr	N-DI-A02	4.02	1.92	-2.1
25 yr 72 hr	N-DI-B04	4.51	2.33	-2.18
25 yr 72 hr	N-DI-B05	4.32	2.45	-1.87
25 yr 72 hr	N-DI-B05x	4.83	2.34	-2.49
25 yr 72 hr	N-DI-B06	4.33	2.56	-1.77
25 yr 72 hr	N-DI-B07	4.83	2.69	-2.14
25 yr 72 hr	N-DI-B08	4.83	2.85	-1.98
25 yr 72 hr	N-DI-B09	4.85	3.13	-1.72
25 yr 72 hr	N-DI-B10	4.87	3.38	-1.49
25 yr 72 hr	N-DI-B10x	4.85	3.14	-1.71
25 yr 72 hr	N-DI-B11	4.86	3.38	-1.48
25 yr 72 hr	N-DI-C03	4.09	2.06	-2.03
25 yr 72 hr	N-DI-C04	4.86	4.62	-0.24
25 yr 72 hr	N-DI-C05	4.76	3.49	-1.27
25 yr 72 hr	N-DP	4.39	1.32	-3.07
25 yr 72 hr	N-DP-A01	4.54	2	-2.54
25 yr 72 hr	N-DP-A02	4.59	2.83	-1.76
25 yr 72 hr	N-DP-A04	4.62	3.6	-1.02
25 yr 72 hr	N-DP-A07	4.89	3.97	-0.92
25 yr 72 hr	N-DP-A08	4.89	3.96	-0.93
25 yr 72 hr	N-DP-A09	4.88	3.64	-1.24
25 yr 72 hr	N-DP-A09x	4.89	4	-0.89
25 yr 72 hr	N-DP-A10	4.88	3.72	-1.16
25 yr 72 hr	N-DP-A11x	4.88	3.74	-1.14
25 yr 72 hr	N-DP-B2	4.57	2.44	-2.13
25 yr 72 hr	N-DP-C02	4.59	2.57	-2.02
25 yr 72 hr	N-DP-C03	3.76	1.79	-1.97
25 yr 72 hr	N-DP-C03x	4.59	2.58	-2.01
25 yr 72 hr	N-DP-D02	4.64	3.19	-1.45
25 yr 72 hr	N-DP-D03x	4.87	4.79	-0.08
25 yr 72 hr	N-DP-D04	4.85	3.7	-1.15
25 yr 72 hr	N-DP-D05x	4.88	3.98	-0.9
25 yr 72 hr	N-DP-D06x	4.94	4.18	-0.76
25 yr 72 hr	N-DP-D07x	5.03	4.33	-0.7
25 yr 72 hr	N-DP-D08x	5.1	4.39	-0.71
25 yr 72 hr	N-DP-D09	5.19	4.56	-0.63
25 yr 72 hr	N-DP-D10	5.55	5.5	-0.05
25 yr 72 hr	N-DP-E05	4.89	4.16	-0.73
25 yr 72 hr	N-DP-E06	4.92	4.9	-0.02
25 yr 72 hr	N-DP-E08	4.89	4.69	-0.2
25 yr 72 hr	N-DP-F07	5.89	5.74	-0.15
25 yr 72 hr	N-DP-F08	5.13	4.68	-0.45

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DP-F09	5.37	5.11	-0.26
25 yr 72 hr	N-DP-G05	4.58	3.66	-0.92
25 yr 72 hr	N-DP-G06	4.58	3.67	-0.91
25 yr 72 hr	N-DP-G07	4.58	3.84	-0.74
25 yr 72 hr	N-DP-G07x	4.57	3.65	-0.92
25 yr 72 hr	N-DP-G08	4.62	4.01	-0.61
25 yr 72 hr	N-DP-G08x	4.58	3.83	-0.75
25 yr 72 hr	N-DP-H04	4.58	2.93	-1.65
25 yr 72 hr	N-DP-H05	4.58	3.1	-1.48
25 yr 72 hr	N-DP-H05x	4.58	3.8	-0.78
25 yr 72 hr	N-DP-H06	4.57	3.42	-1.15
25 yr 72 hr	N-DP-H06x	4.58	4.06	-0.52
25 yr 72 hr	N-DP-K07	4.58	3.48	-1.1
25 yr 72 hr	N-DP-M10	5.26	4.55	-0.71
25 yr 72 hr	N-DP-M11	5.31	4.28	-1.03
25 yr 72 hr	N-DP-M12	5.38	5.27	-0.11
25 yr 72 hr	N-DP-N10	5.12	4.44	-0.68
25 yr 72 hr	N-DP-O10	4.88	3.64	-1.24
25 yr 72 hr	N-DP-O11	4.89	3.76	-1.13
25 yr 72 hr	N-DP-P06	4.64	4.28	-0.36
25 yr 72 hr	N-DP-Y03	5.12	5.12	0
25 yr 72 hr	N-DP-Z12	4.4	4.12	-0.28
25 yr 72 hr	N-DQ-A01	4.55	2.88	-1.67
25 yr 72 hr	N-DQ-A01x	#N/A	3.4	#N/A
25 yr 72 hr	N-DQ-A02	4.56	3.17	-1.39
25 yr 72 hr	N-DQ-A03	4.55	2.44	-2.11
25 yr 72 hr	N-DQ-A03x	3.13	0.93	-2.2
25 yr 72 hr	N-DQ-A04	5.57	5.57	0
25 yr 72 hr	N-DQ-A05	4.36	1.71	-2.65
25 yr 72 hr	N-DQ-A06	4.55	3.38	-1.17
25 yr 72 hr	N-DQ-A07	4.55	3.43	-1.12
25 yr 72 hr	N-DQ-A08	4.55	3.47	-1.08
25 yr 72 hr	N-E01	2.93	2.93	0
25 yr 72 hr	N-E02	3.39	3.39	0
25 yr 72 hr	N-E03	4.02	4.02	0
25 yr 72 hr	N-E07	4.54	4.54	0
25 yr 72 hr	N-E08	3.82	3.82	0
25 yr 72 hr	N-E10	3.74	3.74	0
25 yr 72 hr	N-E11	2.57	2.57	0
25 yr 72 hr	N-EA	1.59	1.59	0
25 yr 72 hr	N-EA-A01	3.86	3.86	0
25 yr 72 hr	N-EA-A02	3.86	3.86	0
25 yr 72 hr	N-EB	1.59	1.59	0
25 yr 72 hr	N-EB-A01	3.03	3.03	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-EC	1.59	1.59	0
25 yr 72 hr	N-EC-A01	3.11	3.11	0
25 yr 72 hr	N-ED	1.59	1.59	0
25 yr 72 hr	N-ED-A01	3.63	3.63	0
25 yr 72 hr	N-ED-A02	3.64	3.64	0
25 yr 72 hr	N-ED-A03	3.64	3.64	0
25 yr 72 hr	N-EE	1.59	1.59	0
25 yr 72 hr	N-EE-A01	3.71	3.71	0
25 yr 72 hr	N-EF	1.59	1.59	0
25 yr 72 hr	N-EF-A01	3.71	3.71	0
25 yr 72 hr	N-EG	1.59	1.59	0
25 yr 72 hr	N-EG-A01	3.46	3.46	0
25 yr 72 hr	N-EG-A02	3.66	3.66	0
25 yr 72 hr	N-EH	1.59	1.59	0
25 yr 72 hr	N-EH-A01	2.02	2.02	0
25 yr 72 hr	N-EI	1.59	1.59	0
25 yr 72 hr	N-EJ	1.59	1.59	0
25 yr 72 hr	N-EJ-A01	1.65	1.65	0
25 yr 72 hr	N-EK	1.59	1.59	0
25 yr 72 hr	N-EK-A01	3.76	3.76	0
25 yr 72 hr	N-EL	1.59	1.59	0
25 yr 72 hr	N-EL-A01	3.04	3.04	0
25 yr 72 hr	N-EM	1.59	1.59	0
25 yr 72 hr	N-EM-A01	2.83	2.83	0
25 yr 72 hr	N-EM-A02	2.74	2.74	0
25 yr 72 hr	N-EM-A03	2.57	2.57	0
25 yr 72 hr	N-EN	1.59	1.59	0
25 yr 72 hr	N-EN-A01	2.92	2.92	0
25 yr 72 hr	N-EO	1.59	1.59	0
25 yr 72 hr	N-EO-A01	2.46	2.46	0
25 yr 72 hr	N-EP	1.59	1.59	0
25 yr 72 hr	N-EP-A01	2.56	2.56	0
25 yr 72 hr	N-EQ	1.59	1.59	0
25 yr 72 hr	N-EQ-A01	1.67	1.67	0
25 yr 72 hr	N-ER	1.59	1.59	0
25 yr 72 hr	N-ES	1.59	1.59	0
25 yr 72 hr	N-ET	1.59	1.59	0
25 yr 72 hr	N-ET-A01	1.6	1.6	0
25 yr 72 hr	N-Pump-C3	#N/A	1.4	#N/A
25 yr 72 hr	Trunkline-Junction-1	#N/A	2.69	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA	1.59	1.59	0
10 yr 1 hr	N-BA-A01	3.33	3.28	-0.05
10 yr 1 hr	N-BA-A02	3.37	3.35	-0.02
10 yr 1 hr	N-BA-A03	3.4	3.38	-0.02
10 yr 1 hr	N-BA-A03x	3.37	3.34	-0.03
10 yr 1 hr	N-BA-A04	3.46	3.45	-0.01
10 yr 1 hr	N-BA-A04x	3.4	3.37	-0.03
10 yr 1 hr	N-BA-A05	3.46	3.45	-0.01
10 yr 1 hr	N-BA-A06	3.58	3.59	0.01
10 yr 1 hr	N-BA-A07	3.65	3.66	0.01
10 yr 1 hr	N-BA-A07x	3.61	3.62	0.01
10 yr 1 hr	N-BA-A08	3.76	3.76	0
10 yr 1 hr	N-BA-A08x	3.65	3.66	0.01
10 yr 1 hr	N-BA-A09	3.91	3.89	-0.02
10 yr 1 hr	N-BA-B02	3.26	3.23	-0.03
10 yr 1 hr	N-BA-B03	3.26	3.23	-0.03
10 yr 1 hr	N-BA-B04	3.25	3.22	-0.03
10 yr 1 hr	N-BA-C03	3.33	3.28	-0.05
10 yr 1 hr	N-BA-C04	3.32	3.25	-0.07
10 yr 1 hr	N-BA-D05	3.48	3.47	-0.01
10 yr 1 hr	N-BA-D06	3.49	3.48	-0.01
10 yr 1 hr	N-BA-D07	3.65	3.66	0.01
10 yr 1 hr	N-BA-D08	3.72	3.73	0.01
10 yr 1 hr	N-BA-E09	3.76	3.76	0
10 yr 1 hr	N-BA-F09	3.87	3.87	0
10 yr 1 hr	N-BA-K04	3.39	3.08	-0.31
10 yr 1 hr	N-BA-K05	3.41	3.3	-0.11
10 yr 1 hr	N-BA-K06	3.6	3.55	-0.05
10 yr 1 hr	N-BA-K08	5.06	5.06	0
10 yr 1 hr	N-BA-L06	3.54	3.47	-0.07
10 yr 1 hr	N-BA-Q05	3.38	3.06	-0.32
10 yr 1 hr	N-BA-Q06	3.38	3.05	-0.33
10 yr 1 hr	N-BA-Q06x	3.38	3.06	-0.32
10 yr 1 hr	N-BA-Q07	3.38	3.06	-0.32
10 yr 1 hr	N-BA-Q07x	3.37	3.05	-0.32
10 yr 1 hr	N-BA-Q08	3.39	3.07	-0.32
10 yr 1 hr	N-BA-R06	3.39	3.09	-0.3
10 yr 1 hr	N-BA-R07	3.38	3.06	-0.32
10 yr 1 hr	N-BA-R07x	3.4	3.1	-0.3
10 yr 1 hr	N-BA-R08	3.38	3.05	-0.33
10 yr 1 hr	N-BA-R08x	3.39	3.06	-0.33
10 yr 1 hr	N-BA-R09	3.38	3.06	-0.32
10 yr 1 hr	N-BA-R10	3.38	3.06	-0.32
10 yr 1 hr	N-BA-R11	3.37	3.04	-0.33

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA-S06a	3.68	3.62	-0.06
10 yr 1 hr	N-BA-T07	3.69	3.68	-0.01
10 yr 1 hr	N-BA-T08	3.68	3.68	0
10 yr 1 hr	N-BA-T08x	3.69	3.69	0
10 yr 1 hr	N-BA-T09	3.4	3.32	-0.08
10 yr 1 hr	N-BA-T09x	3.68	3.67	-0.01
10 yr 1 hr	N-BA-T10	3.4	3.32	-0.08
10 yr 1 hr	N-BA-U02	3.32	3.28	-0.04
10 yr 1 hr	N-BA-U03	3.33	3.29	-0.04
10 yr 1 hr	N-BA-V07	3.75	3.74	-0.01
10 yr 1 hr	N-BA-W08	4.19	4.18	-0.01
10 yr 1 hr	N-BA-W09A	4.2	4.19	-0.01
10 yr 1 hr	N-BA-W09B	4.17	4.16	-0.01
10 yr 1 hr	N-BB	1.59	1.59	0
10 yr 1 hr	N-BB-A01	3.32	2.37	-0.95
10 yr 1 hr	N-BB-A02	3.33	2.61	-0.72
10 yr 1 hr	N-BB-A03	3.31	2.58	-0.73
10 yr 1 hr	N-BB-A04	3.32	2.6	-0.72
10 yr 1 hr	N-BC	1.59	1.59	0
10 yr 1 hr	N-BC-A01	2.39	2.39	0
10 yr 1 hr	N-BC-A02	4.78	4.78	0
10 yr 1 hr	N-BD	1.59	1.59	0
10 yr 1 hr	N-BD-A01	3.33	2.08	-1.25
10 yr 1 hr	N-BD-A02	3.36	3.02	-0.34
10 yr 1 hr	N-BD-A02x	3.37	3.02	-0.35
10 yr 1 hr	N-BD-A03	3.37	3.02	-0.35
10 yr 1 hr	N-BD-A05	3.37	3.06	-0.31
10 yr 1 hr	N-BD-B02	3.33	2.55	-0.78
10 yr 1 hr	N-BD-B03	3.32	2.55	-0.77
10 yr 1 hr	N-BD-B04	3.32	2.61	-0.71
10 yr 1 hr	N-BD-B04x	3.32	2.68	-0.64
10 yr 1 hr	N-BE	1.59	1.59	0
10 yr 1 hr	N-BE-A01	3.31	2.8	-0.51
10 yr 1 hr	N-BE-A03	3.39	3.13	-0.26
10 yr 1 hr	N-BE-A04	3.4	3.15	-0.25
10 yr 1 hr	N-BF	1.59	1.59	0
10 yr 1 hr	N-BF-A01	3.9	3.91	0.01
10 yr 1 hr	N-CA	1.59	1.59	0
10 yr 1 hr	N-CA-A01c	5.81	8.51	2.7
10 yr 1 hr	N-CA-A01d	3.23	2.13	-1.1
10 yr 1 hr	N-CA-A02	3.35	3.04	-0.31
10 yr 1 hr	N-CA-A03	3.37	3.15	-0.22
10 yr 1 hr	N-CA-A04	3.4	3.26	-0.14
10 yr 1 hr	N-CA-A05	3.41	3.33	-0.08

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Area E Improvement Projects Unselected Alternative (2E)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-A07	4.72	4.71	-0.01
10 yr 1 hr	N-CA-B03	3.36	3.1	-0.26
10 yr 1 hr	N-CA-B04	3.38	3.18	-0.2
10 yr 1 hr	N-CA-B07	4.35	4.32	-0.03
10 yr 1 hr	N-CA-C03	3.13	2.92	-0.21
10 yr 1 hr	N-CA-C04	3.11	2.92	-0.19
10 yr 1 hr	N-CA-C05	3.14	2.93	-0.21
10 yr 1 hr	N-CA-D06	3.62	3.61	-0.01
10 yr 1 hr	N-CA-D07	3.62	3.62	0
10 yr 1 hr	N-CA-D07x	3.79	3.79	0
10 yr 1 hr	N-CA-D08	3.13	3.11	-0.02
10 yr 1 hr	N-CA-D08x	3.64	3.64	0
10 yr 1 hr	N-CA-D09x	3.13	3.11	-0.02
10 yr 1 hr	N-CA-E07	4.42	4.38	-0.04
10 yr 1 hr	N-CA-E08	4.43	4.39	-0.04
10 yr 1 hr	N-CA-E09x	4.57	4.57	0
10 yr 1 hr	N-CA-F04	3.37	3.17	-0.2
10 yr 1 hr	N-CA-F05	3.09	2.96	-0.13
10 yr 1 hr	N-CA-F05x	3.19	3.05	-0.14
10 yr 1 hr	N-CA-F06	3.08	2.96	-0.12
10 yr 1 hr	N-CA-F06x	3.07	2.92	-0.15
10 yr 1 hr	N-CA-F07	3.08	3.03	-0.05
10 yr 1 hr	N-CA-F07x	3.07	2.91	-0.16
10 yr 1 hr	N-CA-F08	3.09	3.06	-0.03
10 yr 1 hr	N-CA-F09	3.09	3.07	-0.02
10 yr 1 hr	N-CA-F09x	3.09	3.06	-0.03
10 yr 1 hr	N-CA-F10	3.1	3.07	-0.03
10 yr 1 hr	N-CA-F11	3.1	3.07	-0.03
10 yr 1 hr	N-CA-F11x	3.09	3.07	-0.02
10 yr 1 hr	N-CA-F12	3.1	3.08	-0.02
10 yr 1 hr	N-CA-F12x	3.1	3.07	-0.03
10 yr 1 hr	N-CA-G08	3.1	3.07	-0.03
10 yr 1 hr	N-CA-G09	3.1	3.07	-0.03
10 yr 1 hr	N-CA-G10	3.39	3.31	-0.08
10 yr 1 hr	N-CA-G11x	3.37	3.25	-0.12
10 yr 1 hr	N-CA-H09	3.1	3.07	-0.03
10 yr 1 hr	N-CA-H10	3.1	3.08	-0.02
10 yr 1 hr	N-CA-H10x	3.1	3.08	-0.02
10 yr 1 hr	N-CA-H11	3.12	3.1	-0.02
10 yr 1 hr	N-CA-H11x	3.1	3.08	-0.02
10 yr 1 hr	N-CA-H12	3.12	3.1	-0.02
10 yr 1 hr	N-CA-H13	3.24	3.24	0
10 yr 1 hr	N-CA-H14	3.32	3.32	0
10 yr 1 hr	N-CA-I12	3.12	3.1	-0.02

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-I13	3.12	3.1	-0.02
10 yr 1 hr	N-CA-I14	3.12	3.1	-0.02
10 yr 1 hr	N-CA-J14	3.26	3.26	0
10 yr 1 hr	N-CA-J15x	3.3	3.3	0
10 yr 1 hr	N-CA-K03	3.36	3.06	-0.3
10 yr 1 hr	N-CA-L04	3.38	3.18	-0.2
10 yr 1 hr	N-CA-L05	3.52	3.45	-0.07
10 yr 1 hr	N-CA-M06	3.55	3.53	-0.02
10 yr 1 hr	N-CA-N05	3.57	3.55	-0.02
10 yr 1 hr	N-CA-O08	4.93	4.93	0
10 yr 1 hr	N-CA-S05	3.23	3.13	-0.1
10 yr 1 hr	N-CA-T08	3.06	2.91	-0.15
10 yr 1 hr	N-CA-T09	3.06	2.91	-0.15
10 yr 1 hr	N-CB	1.59	1.59	0
10 yr 1 hr	N-CB-A01	3	2.87	-0.13
10 yr 1 hr	N-CC	1.59	1.59	0
10 yr 1 hr	N-CC-A01	2.81	2.54	-0.27
10 yr 1 hr	N-CC-A02	2.84	2.56	-0.28
10 yr 1 hr	N-CC-A03	3.06	2.89	-0.17
10 yr 1 hr	N-CE	1.59	1.59	0
10 yr 1 hr	N-CE-A01	3.1	3.08	-0.02
10 yr 1 hr	N-CE-A02	3.1	3.08	-0.02
10 yr 1 hr	N-CE-A03	3.1	3.08	-0.02
10 yr 1 hr	N-CF	1.59	1.59	0
10 yr 1 hr	N-CF-A01	3.12	3.1	-0.02
10 yr 1 hr	N-CF-A02	3.12	3.1	-0.02
10 yr 1 hr	N-CF-A03x	3.12	3.1	-0.02
10 yr 1 hr	N-CG	1.59	1.59	0
10 yr 1 hr	N-CG-A01	3.12	3.1	-0.02
10 yr 1 hr	N-CG-A02x	3.12	3.1	-0.02
10 yr 1 hr	N-CG-A03x	3.26	3.26	0
10 yr 1 hr	N-CH	1.59	1.59	0
10 yr 1 hr	N-CH-A01b	1.81	1.81	0
10 yr 1 hr	N-CH-A02	2.23	2.23	0
10 yr 1 hr	N-CH-A03	3.64	3.64	0
10 yr 1 hr	N-CH-A04	3.76	3.76	0
10 yr 1 hr	N-CH-B02	2.87	2.87	0
10 yr 1 hr	N-CH-B03	3.84	3.84	0
10 yr 1 hr	N-CH-B03x	2.89	2.89	0
10 yr 1 hr	N-CH-B04	3.91	3.91	0
10 yr 1 hr	N-CH-B04x	4.04	4.04	0
10 yr 1 hr	N-CH-B05	4.72	4.72	0
10 yr 1 hr	N-CH-B05x	3.99	3.99	0
10 yr 1 hr	N-CH-B06	4.88	4.88	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CH-B06x	4.82	4.82	0
10 yr 1 hr	N-CH-B07	5.89	5.89	0
10 yr 1 hr	N-CH-C04	3.75	3.75	0
10 yr 1 hr	N-CH-C05	3.77	3.77	0
10 yr 1 hr	N-CH-C05x1	3.77	3.77	0
10 yr 1 hr	N-CH-C05x2	3.77	3.77	0
10 yr 1 hr	N-CH-C05x3	3.77	3.77	0
10 yr 1 hr	N-CH-C06	3.78	3.77	-0.01
10 yr 1 hr	N-CH-C06x	3.77	3.77	0
10 yr 1 hr	N-CH-C07x	3.77	3.77	0
10 yr 1 hr	N-CH-D05	3.77	3.77	0
10 yr 1 hr	N-CH-D06	3.77	3.77	0
10 yr 1 hr	N-CH-D08x	3.77	3.77	0
10 yr 1 hr	N-CH-E06	3.78	3.78	0
10 yr 1 hr	N-CH-E07	3.78	3.78	0
10 yr 1 hr	N-CH-F07	3.78	3.78	0
10 yr 1 hr	N-CH-F08	3.78	3.78	0
10 yr 1 hr	N-CH-G07	3.77	3.77	0
10 yr 1 hr	N-CH-G08	3.77	3.77	0
10 yr 1 hr	N-CH-G09	3.77	3.77	0
10 yr 1 hr	N-CH-G10	3.77	3.77	0
10 yr 1 hr	N-CH-G11	3.77	3.77	0
10 yr 1 hr	N-CH-I04	3.73	3.73	0
10 yr 1 hr	N-CH-I05x1	3.76	3.76	0
10 yr 1 hr	N-CH-I05x2	3.76	3.76	0
10 yr 1 hr	N-CH-I05x3	3.76	3.76	0
10 yr 1 hr	N-CH-I05x4	3.76	3.76	0
10 yr 1 hr	N-CI	1.59	1.59	0
10 yr 1 hr	N-D10	3.77	3.77	0
10 yr 1 hr	N-D16	2.53	2.54	0.01
10 yr 1 hr	N-D19	4.78	4.78	0
10 yr 1 hr	N-D20	4.77	4.77	0
10 yr 1 hr	N-D22	4.79	4.79	0
10 yr 1 hr	N-D30	4.76	4.76	0
10 yr 1 hr	N-DA	1.59	1.59	0
10 yr 1 hr	N-DA-A01	3.36	3.36	0
10 yr 1 hr	N-DB	1.59	1.59	0
10 yr 1 hr	N-DC	1.59	1.59	0
10 yr 1 hr	N-DI-A01	3.51	3.51	0
10 yr 1 hr	N-DI-A02	3.52	3.53	0.01
10 yr 1 hr	N-DI-B04	4.27	4.28	0.01
10 yr 1 hr	N-DI-B05	4.03	4.04	0.01
10 yr 1 hr	N-DI-B05x	4.71	4.71	0
10 yr 1 hr	N-DI-B06	4.04	4.05	0.01

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DI-B07	4.72	4.72	0
10 yr 1 hr	N-DI-B08	4.72	4.72	0
10 yr 1 hr	N-DI-B09	4.73	4.73	0
10 yr 1 hr	N-DI-B10	4.75	4.75	0
10 yr 1 hr	N-DI-B10x	4.73	4.73	0
10 yr 1 hr	N-DI-B11	4.74	4.75	0.01
10 yr 1 hr	N-DI-C03	3.55	3.56	0.01
10 yr 1 hr	N-DI-C04	4.78	4.79	0.01
10 yr 1 hr	N-DI-C05	4.52	4.53	0.01
10 yr 1 hr	N-DP	4.17	4.16	-0.01
10 yr 1 hr	N-DP-A01	4.32	4.31	-0.01
10 yr 1 hr	N-DP-A02	4.36	4.35	-0.01
10 yr 1 hr	N-DP-A04	4.39	4.38	-0.01
10 yr 1 hr	N-DP-A07	4.77	4.78	0.01
10 yr 1 hr	N-DP-A08	4.77	4.77	0
10 yr 1 hr	N-DP-A09	4.77	4.77	0
10 yr 1 hr	N-DP-A09x	4.77	4.77	0
10 yr 1 hr	N-DP-A10	4.76	4.76	0
10 yr 1 hr	N-DP-A11x	4.76	4.76	0
10 yr 1 hr	N-DP-B2	4.35	4.34	-0.01
10 yr 1 hr	N-DP-C02	4.37	4.37	0
10 yr 1 hr	N-DP-C03	3.36	3.36	0
10 yr 1 hr	N-DP-C03x	4.37	4.37	0
10 yr 1 hr	N-DP-D02	4.43	4.44	0.01
10 yr 1 hr	N-DP-D03x	4.82	4.82	0
10 yr 1 hr	N-DP-D04	4.59	4.6	0.01
10 yr 1 hr	N-DP-D05x	4.64	4.65	0.01
10 yr 1 hr	N-DP-D05y	4.75	4.75	0
10 yr 1 hr	N-DP-D06x	4.71	4.72	0.01
10 yr 1 hr	N-DP-D06y	4.87	4.88	0.01
10 yr 1 hr	N-DP-D07x	4.81	4.82	0.01
10 yr 1 hr	N-DP-D07y	4.91	4.92	0.01
10 yr 1 hr	N-DP-D08x	4.89	4.9	0.01
10 yr 1 hr	N-DP-D08y	4.94	4.95	0.01
10 yr 1 hr	N-DP-D09	5.01	5.01	0
10 yr 1 hr	N-DP-D10	5.4	5.41	0.01
10 yr 1 hr	N-DP-E05	4.74	4.75	0.01
10 yr 1 hr	N-DP-E06	4.86	4.86	0
10 yr 1 hr	N-DP-E08	4.78	4.78	0
10 yr 1 hr	N-DP-F07	5.1	5.1	0
10 yr 1 hr	N-DP-F08	4.94	4.95	0.01
10 yr 1 hr	N-DP-F09	4.96	4.96	0
10 yr 1 hr	N-DP-G05	4.36	4.35	-0.01
10 yr 1 hr	N-DP-G06	4.36	4.34	-0.02

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DP-G07	4.36	4.34	-0.02
10 yr 1 hr	N-DP-G07x	4.35	4.33	-0.02
10 yr 1 hr	N-DP-G08	4.39	4.4	0.01
10 yr 1 hr	N-DP-G08x	4.36	4.34	-0.02
10 yr 1 hr	N-DP-H04	4.36	4.35	-0.01
10 yr 1 hr	N-DP-H05	4.36	4.34	-0.02
10 yr 1 hr	N-DP-H05x	4.36	4.34	-0.02
10 yr 1 hr	N-DP-H06	4.35	4.33	-0.02
10 yr 1 hr	N-DP-H06x	4.36	4.34	-0.02
10 yr 1 hr	N-DP-K07	4.36	4.34	-0.02
10 yr 1 hr	N-DP-M10	5.11	5.11	0
10 yr 1 hr	N-DP-M11	5.2	5.2	0
10 yr 1 hr	N-DP-M12	5.25	5.25	0
10 yr 1 hr	N-DP-N10	4.89	4.9	0.01
10 yr 1 hr	N-DP-O10	4.77	4.77	0
10 yr 1 hr	N-DP-O11	4.88	4.88	0
10 yr 1 hr	N-DP-P06	4.6	4.6	0
10 yr 1 hr	N-DP-Y03	5.11	5.11	0
10 yr 1 hr	N-DP-Z12	4.26	4.26	0
10 yr 1 hr	N-DQ-A01	4.33	4.3	-0.03
10 yr 1 hr	N-E01	2.9	2.89	-0.01
10 yr 1 hr	N-E02	3.35	2.21	-1.14
10 yr 1 hr	N-E03	4	4	0
10 yr 1 hr	N-E07	4.49	4.49	0
10 yr 1 hr	N-E08	3.78	3.78	0
10 yr 1 hr	N-E10	3.71	3.71	0
10 yr 1 hr	N-E11	1.83	1.83	0
10 yr 1 hr	N-EA	1.59	1.59	0
10 yr 1 hr	N-EA-A01	3.81	2.22	-1.59
10 yr 1 hr	N-EA-A02	3.81	2.27	-1.54
10 yr 1 hr	N-EB	1.59	1.59	0
10 yr 1 hr	N-EB-A01	2.52	2.07	-0.45
10 yr 1 hr	N-EC	1.59	1.59	0
10 yr 1 hr	N-EC-A01	2.69	2.07	-0.62
10 yr 1 hr	N-ED	1.59	1.59	0
10 yr 1 hr	N-ED-A01	3.24	2.11	-1.13
10 yr 1 hr	N-ED-A02	3.41	2.17	-1.24
10 yr 1 hr	N-ED-A03	3.51	2.17	-1.34
10 yr 1 hr	N-EE	1.59	1.59	0
10 yr 1 hr	N-EE-A01	3.66	2.15	-1.51
10 yr 1 hr	N-EF	1.59	1.59	0
10 yr 1 hr	N-EF-A01	3.11	1.81	-1.3
10 yr 1 hr	N-EG	1.59	1.59	0
10 yr 1 hr	N-EG-A01	3.43	2.19	-1.24

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-EG-A02	3.62	2.18	-1.44
10 yr 1 hr	N-EH	1.59	1.59	0
10 yr 1 hr	N-EH-A01	1.77	2.14	0.37
10 yr 1 hr	N-EI	1.59	1.59	0
10 yr 1 hr	N-EJ	1.59	1.59	0
10 yr 1 hr	N-EJ-A01	1.61	1.61	0
10 yr 1 hr	N-EK	1.59	1.59	0
10 yr 1 hr	N-EK-A01	3.68	3.68	0
10 yr 1 hr	N-EL	1.59	1.59	0
10 yr 1 hr	N-EL-A01	3.01	3	-0.01
10 yr 1 hr	N-EM	1.59	1.59	0
10 yr 1 hr	N-EM-A01	2.63	2.62	-0.01
10 yr 1 hr	N-EM-A02	2.61	2.62	0.01
10 yr 1 hr	N-EM-A03	2	2	0
10 yr 1 hr	N-EN	1.59	1.59	0
10 yr 1 hr	N-EN-A01	2.83	2.59	-0.24
10 yr 1 hr	N-EO	1.59	1.59	0
10 yr 1 hr	N-EO-A01	2.22	2.18	-0.04
10 yr 1 hr	N-EP	1.59	1.59	0
10 yr 1 hr	N-EP-A01	1.98	1.98	0
10 yr 1 hr	N-EQ	1.59	1.59	0
10 yr 1 hr	N-EQ-A01	1.65	1.65	0
10 yr 1 hr	N-ER	1.59	1.59	0
10 yr 1 hr	N-ES	1.59	1.59	0
10 yr 1 hr	N-ET	1.59	1.59	0
10 yr 1 hr	N-ET-A01	1.59	1.59	0
10 yr 1 hr	NAltAdd_01	#N/A	2.16	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA	1.59	1.59	0
25 yr 72 hr	N-BA-A01	3.55	3.38	-0.17
25 yr 72 hr	N-BA-A02	3.6	3.46	-0.14
25 yr 72 hr	N-BA-A03	3.64	3.5	-0.14
25 yr 72 hr	N-BA-A03x	3.6	3.45	-0.15
25 yr 72 hr	N-BA-A04	3.71	3.58	-0.13
25 yr 72 hr	N-BA-A04x	3.63	3.49	-0.14
25 yr 72 hr	N-BA-A05	3.72	3.59	-0.13
25 yr 72 hr	N-BA-A06	3.78	3.72	-0.06
25 yr 72 hr	N-BA-A07	3.82	3.79	-0.03
25 yr 72 hr	N-BA-A07x	3.81	3.76	-0.05
25 yr 72 hr	N-BA-A08	3.83	3.81	-0.02
25 yr 72 hr	N-BA-A08x	3.82	3.79	-0.03
25 yr 72 hr	N-BA-A09	4.01	3.98	-0.03
25 yr 72 hr	N-BA-B02	3.41	3.3	-0.11
25 yr 72 hr	N-BA-B03	3.41	3.3	-0.11
25 yr 72 hr	N-BA-B04	3.39	3.29	-0.1
25 yr 72 hr	N-BA-C03	3.57	3.37	-0.2
25 yr 72 hr	N-BA-C04	3.57	3.34	-0.23
25 yr 72 hr	N-BA-D05	3.73	3.61	-0.12
25 yr 72 hr	N-BA-D06	3.75	3.62	-0.13
25 yr 72 hr	N-BA-D07	3.85	3.81	-0.04
25 yr 72 hr	N-BA-D08	3.89	3.86	-0.03
25 yr 72 hr	N-BA-E09	3.83	3.81	-0.02
25 yr 72 hr	N-BA-F09	3.88	3.88	0
25 yr 72 hr	N-BA-K04	3.69	3.47	-0.22
25 yr 72 hr	N-BA-K05	3.72	3.52	-0.2
25 yr 72 hr	N-BA-K06	3.78	3.72	-0.06
25 yr 72 hr	N-BA-K08	5.08	5.08	0
25 yr 72 hr	N-BA-L06	3.76	3.72	-0.04
25 yr 72 hr	N-BA-Q05	3.67	3.44	-0.23
25 yr 72 hr	N-BA-Q06	3.66	3.43	-0.23
25 yr 72 hr	N-BA-Q06x	3.67	3.45	-0.22
25 yr 72 hr	N-BA-Q07	3.68	3.45	-0.23
25 yr 72 hr	N-BA-Q07x	3.66	3.43	-0.23
25 yr 72 hr	N-BA-Q08	3.68	3.46	-0.22
25 yr 72 hr	N-BA-R06	3.69	3.48	-0.21
25 yr 72 hr	N-BA-R07	3.68	3.44	-0.24
25 yr 72 hr	N-BA-R07x	3.7	3.48	-0.22
25 yr 72 hr	N-BA-R08	3.66	3.42	-0.24
25 yr 72 hr	N-BA-R08x	3.68	3.45	-0.23
25 yr 72 hr	N-BA-R09	3.67	3.43	-0.24
25 yr 72 hr	N-BA-R10	3.67	3.44	-0.23
25 yr 72 hr	N-BA-R11	3.65	3.41	-0.24

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA-S06a	3.94	3.89	-0.05
25 yr 72 hr	N-BA-T07	3.73	3.71	-0.02
25 yr 72 hr	N-BA-T08	3.72	3.71	-0.01
25 yr 72 hr	N-BA-T08x	3.73	3.72	-0.01
25 yr 72 hr	N-BA-T09	3.69	3.47	-0.22
25 yr 72 hr	N-BA-T09x	3.71	3.7	-0.01
25 yr 72 hr	N-BA-T10	3.69	3.47	-0.22
25 yr 72 hr	N-BA-U02	3.55	3.38	-0.17
25 yr 72 hr	N-BA-U03	3.56	3.4	-0.16
25 yr 72 hr	N-BA-V07	3.8	3.79	-0.01
25 yr 72 hr	N-BA-W08	4.54	4.51	-0.03
25 yr 72 hr	N-BA-W09A	4.55	4.53	-0.02
25 yr 72 hr	N-BA-W09B	4.51	4.48	-0.03
25 yr 72 hr	N-BB	1.59	1.59	0
25 yr 72 hr	N-BB-A01	3.6	3.29	-0.31
25 yr 72 hr	N-BB-A02	3.59	3.29	-0.3
25 yr 72 hr	N-BB-A03	3.57	3.26	-0.31
25 yr 72 hr	N-BB-A04	3.58	3.28	-0.3
25 yr 72 hr	N-BC	1.59	1.59	0
25 yr 72 hr	N-BC-A01	2.54	2.54	0
25 yr 72 hr	N-BC-A02	4.82	4.82	0
25 yr 72 hr	N-BD	1.59	1.59	0
25 yr 72 hr	N-BD-A01	3.59	2.88	-0.71
25 yr 72 hr	N-BD-A02	3.64	3.38	-0.26
25 yr 72 hr	N-BD-A02x	3.65	3.39	-0.26
25 yr 72 hr	N-BD-A03	3.65	3.39	-0.26
25 yr 72 hr	N-BD-A05	3.64	3.42	-0.22
25 yr 72 hr	N-BD-B02	3.59	2.92	-0.67
25 yr 72 hr	N-BD-B03	3.57	2.93	-0.64
25 yr 72 hr	N-BD-B04	3.64	3.1	-0.54
25 yr 72 hr	N-BD-B04x	3.57	2.93	-0.64
25 yr 72 hr	N-BE	1.59	1.59	0
25 yr 72 hr	N-BE-A01	3.56	3.31	-0.25
25 yr 72 hr	N-BE-A03	3.68	3.46	-0.22
25 yr 72 hr	N-BE-A04	3.68	3.46	-0.22
25 yr 72 hr	N-BF	1.59	1.59	0
25 yr 72 hr	N-BF-A01	4.06	4.07	0.01
25 yr 72 hr	N-CA	1.59	1.59	0
25 yr 72 hr	N-CA-A01c	5.81	8.51	2.7
25 yr 72 hr	N-CA-A01d	3.45	2.47	-0.98
25 yr 72 hr	N-CA-A02	3.58	3.38	-0.2
25 yr 72 hr	N-CA-A03	3.59	3.42	-0.17
25 yr 72 hr	N-CA-A04	3.6	3.45	-0.15
25 yr 72 hr	N-CA-A05	3.6	3.46	-0.14

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-A07	5.04	5.01	-0.03
25 yr 72 hr	N-CA-B03	3.59	3.4	-0.19
25 yr 72 hr	N-CA-B04	3.6	3.44	-0.16
25 yr 72 hr	N-CA-B07	4.7	4.62	-0.08
25 yr 72 hr	N-CA-C03	3.38	3.21	-0.17
25 yr 72 hr	N-CA-C04	3.35	3.19	-0.16
25 yr 72 hr	N-CA-C05	3.39	3.22	-0.17
25 yr 72 hr	N-CA-D06	3.64	3.64	0
25 yr 72 hr	N-CA-D07	3.65	3.64	-0.01
25 yr 72 hr	N-CA-D07x	3.81	3.81	0
25 yr 72 hr	N-CA-D08	3.4	3.25	-0.15
25 yr 72 hr	N-CA-D08x	3.66	3.66	0
25 yr 72 hr	N-CA-D09x	3.4	3.25	-0.15
25 yr 72 hr	N-CA-E07	4.8	4.72	-0.08
25 yr 72 hr	N-CA-E08	4.82	4.73	-0.09
25 yr 72 hr	N-CA-E09x	5.03	4.95	-0.08
25 yr 72 hr	N-CA-F04	3.56	3.42	-0.14
25 yr 72 hr	N-CA-F05	3.36	3.19	-0.17
25 yr 72 hr	N-CA-F05x	3.43	3.27	-0.16
25 yr 72 hr	N-CA-F06	3.35	3.18	-0.17
25 yr 72 hr	N-CA-F06x	3.33	3.17	-0.16
25 yr 72 hr	N-CA-F07	3.34	3.18	-0.16
25 yr 72 hr	N-CA-F07x	3.33	3.16	-0.17
25 yr 72 hr	N-CA-F08	3.36	3.21	-0.15
25 yr 72 hr	N-CA-F09	3.36	3.21	-0.15
25 yr 72 hr	N-CA-F09x	3.36	3.2	-0.16
25 yr 72 hr	N-CA-F10	3.37	3.21	-0.16
25 yr 72 hr	N-CA-F11	3.37	3.22	-0.15
25 yr 72 hr	N-CA-F11x	3.37	3.21	-0.16
25 yr 72 hr	N-CA-F12	3.37	3.22	-0.15
25 yr 72 hr	N-CA-F12x	3.37	3.22	-0.15
25 yr 72 hr	N-CA-G08	3.37	3.21	-0.16
25 yr 72 hr	N-CA-G09	3.38	3.22	-0.16
25 yr 72 hr	N-CA-G10	3.58	3.44	-0.14
25 yr 72 hr	N-CA-G11x	3.56	3.43	-0.13
25 yr 72 hr	N-CA-H09	3.38	3.22	-0.16
25 yr 72 hr	N-CA-H10	3.38	3.22	-0.16
25 yr 72 hr	N-CA-H10x	3.37	3.22	-0.15
25 yr 72 hr	N-CA-H11	3.39	3.24	-0.15
25 yr 72 hr	N-CA-H11x	3.38	3.22	-0.16
25 yr 72 hr	N-CA-H12	3.39	3.24	-0.15
25 yr 72 hr	N-CA-H13	3.4	3.28	-0.12
25 yr 72 hr	N-CA-H14	3.41	3.34	-0.07
25 yr 72 hr	N-CA-I12	3.39	3.24	-0.15

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-I13	3.39	3.24	-0.15
25 yr 72 hr	N-CA-I14	3.39	3.24	-0.15
25 yr 72 hr	N-CA-J14	3.4	3.3	-0.1
25 yr 72 hr	N-CA-J15x	3.4	3.33	-0.07
25 yr 72 hr	N-CA-K03	3.62	3.4	-0.22
25 yr 72 hr	N-CA-L04	3.6	3.43	-0.17
25 yr 72 hr	N-CA-L05	3.73	3.69	-0.04
25 yr 72 hr	N-CA-M06	3.77	3.73	-0.04
25 yr 72 hr	N-CA-N05	3.66	3.64	-0.02
25 yr 72 hr	N-CA-O08	4.98	4.97	-0.01
25 yr 72 hr	N-CA-S05	3.41	3.28	-0.13
25 yr 72 hr	N-CA-T08	3.32	3.16	-0.16
25 yr 72 hr	N-CA-T09	3.32	3.16	-0.16
25 yr 72 hr	N-CB	1.59	1.59	0
25 yr 72 hr	N-CB-A01	3.19	3.07	-0.12
25 yr 72 hr	N-CC	1.59	1.59	0
25 yr 72 hr	N-CC-A01	3.15	2.96	-0.19
25 yr 72 hr	N-CC-A02	3.18	2.99	-0.19
25 yr 72 hr	N-CC-A03	3.31	3.15	-0.16
25 yr 72 hr	N-CE	1.59	1.59	0
25 yr 72 hr	N-CE-A01	3.37	3.22	-0.15
25 yr 72 hr	N-CE-A02	3.37	3.22	-0.15
25 yr 72 hr	N-CE-A03	3.37	3.22	-0.15
25 yr 72 hr	N-CF	1.59	1.59	0
25 yr 72 hr	N-CF-A01	3.38	3.24	-0.14
25 yr 72 hr	N-CF-A02	3.38	3.24	-0.14
25 yr 72 hr	N-CF-A03x	3.38	3.24	-0.14
25 yr 72 hr	N-CG	1.59	1.59	0
25 yr 72 hr	N-CG-A01	3.38	3.24	-0.14
25 yr 72 hr	N-CG-A02x	3.39	3.24	-0.15
25 yr 72 hr	N-CG-A03x	3.39	3.27	-0.12
25 yr 72 hr	N-CH	1.59	1.59	0
25 yr 72 hr	N-CH-A01b	1.88	1.88	0
25 yr 72 hr	N-CH-A02	2.75	2.74	-0.01
25 yr 72 hr	N-CH-A03	3.93	3.93	0
25 yr 72 hr	N-CH-A04	4.03	4.03	0
25 yr 72 hr	N-CH-B02	2.96	2.96	0
25 yr 72 hr	N-CH-B03	3.9	3.9	0
25 yr 72 hr	N-CH-B03x	3.08	3.08	0
25 yr 72 hr	N-CH-B04	3.94	3.94	0
25 yr 72 hr	N-CH-B04x	4.12	4.12	0
25 yr 72 hr	N-CH-B05	4.75	4.75	0
25 yr 72 hr	N-CH-B05x	4.05	4.04	-0.01
25 yr 72 hr	N-CH-B06	4.88	4.88	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CH-B06x	4.83	4.83	0
25 yr 72 hr	N-CH-B07	5.93	5.93	0
25 yr 72 hr	N-CH-C04	4.02	4.02	0
25 yr 72 hr	N-CH-C05	4.04	4.04	0
25 yr 72 hr	N-CH-C05x1	4.03	4.03	0
25 yr 72 hr	N-CH-C05x2	4.03	4.03	0
25 yr 72 hr	N-CH-C05x3	4.03	4.03	0
25 yr 72 hr	N-CH-C06	4.04	4.04	0
25 yr 72 hr	N-CH-C06x	4.04	4.04	0
25 yr 72 hr	N-CH-C07x	4.04	4.04	0
25 yr 72 hr	N-CH-D05	4.03	4.03	0
25 yr 72 hr	N-CH-D06	4.03	4.03	0
25 yr 72 hr	N-CH-D08x	4.04	4.03	-0.01
25 yr 72 hr	N-CH-E06	4.04	4.04	0
25 yr 72 hr	N-CH-E07	4.04	4.04	0
25 yr 72 hr	N-CH-F07	4.05	4.04	-0.01
25 yr 72 hr	N-CH-F08	4.05	4.05	0
25 yr 72 hr	N-CH-G07	4.03	4.03	0
25 yr 72 hr	N-CH-G08	4.03	4.02	-0.01
25 yr 72 hr	N-CH-G09	4.02	4.02	0
25 yr 72 hr	N-CH-G10	4.02	4.02	0
25 yr 72 hr	N-CH-G11	4.03	4.03	0
25 yr 72 hr	N-CH-I04	3.99	3.99	0
25 yr 72 hr	N-CH-I05x1	4.02	4.02	0
25 yr 72 hr	N-CH-I05x2	4.01	4.01	0
25 yr 72 hr	N-CH-I05x3	4.01	4.01	0
25 yr 72 hr	N-CH-I05x4	4.02	4.02	0
25 yr 72 hr	N-CI	1.59	1.59	0
25 yr 72 hr	N-D10	4.03	4.03	0
25 yr 72 hr	N-D16	2.55	2.55	0
25 yr 72 hr	N-D19	4.89	4.9	0.01
25 yr 72 hr	N-D20	4.89	4.89	0
25 yr 72 hr	N-D22	4.86	4.86	0
25 yr 72 hr	N-D30	4.87	4.88	0.01
25 yr 72 hr	N-DA	1.59	1.59	0
25 yr 72 hr	N-DA-A01	3.76	3.76	0
25 yr 72 hr	N-DB	1.59	1.59	0
25 yr 72 hr	N-DC	1.59	1.59	0
25 yr 72 hr	N-DI-A01	3.98	3.99	0.01
25 yr 72 hr	N-DI-A02	4.02	4.02	0
25 yr 72 hr	N-DI-B04	4.51	4.51	0
25 yr 72 hr	N-DI-B05	4.32	4.32	0
25 yr 72 hr	N-DI-B05x	4.83	4.83	0
25 yr 72 hr	N-DI-B06	4.33	4.33	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DI-B07	4.83	4.83	0
25 yr 72 hr	N-DI-B08	4.83	4.84	0.01
25 yr 72 hr	N-DI-B09	4.85	4.85	0
25 yr 72 hr	N-DI-B10	4.87	4.87	0
25 yr 72 hr	N-DI-B10x	4.85	4.85	0
25 yr 72 hr	N-DI-B11	4.86	4.86	0
25 yr 72 hr	N-DI-C03	4.09	4.09	0
25 yr 72 hr	N-DI-C04	4.86	4.86	0
25 yr 72 hr	N-DI-C05	4.76	4.74	-0.02
25 yr 72 hr	N-DP	4.39	4.33	-0.06
25 yr 72 hr	N-DP-A01	4.54	4.48	-0.06
25 yr 72 hr	N-DP-A02	4.59	4.53	-0.06
25 yr 72 hr	N-DP-A04	4.62	4.57	-0.05
25 yr 72 hr	N-DP-A07	4.89	4.89	0
25 yr 72 hr	N-DP-A08	4.89	4.89	0
25 yr 72 hr	N-DP-A09	4.88	4.88	0
25 yr 72 hr	N-DP-A09x	4.89	4.89	0
25 yr 72 hr	N-DP-A10	4.88	4.88	0
25 yr 72 hr	N-DP-A11x	4.88	4.88	0
25 yr 72 hr	N-DP-B2	4.57	4.52	-0.05
25 yr 72 hr	N-DP-C02	4.59	4.54	-0.05
25 yr 72 hr	N-DP-C03	3.76	3.77	0.01
25 yr 72 hr	N-DP-C03x	4.59	4.55	-0.04
25 yr 72 hr	N-DP-D02	4.64	4.6	-0.04
25 yr 72 hr	N-DP-D03x	4.87	4.87	0
25 yr 72 hr	N-DP-D04	4.85	4.85	0
25 yr 72 hr	N-DP-D05x	4.88	4.88	0
25 yr 72 hr	N-DP-D05y	4.9	4.9	0
25 yr 72 hr	N-DP-D06x	4.94	4.94	0
25 yr 72 hr	N-DP-D06y	5.03	5.03	0
25 yr 72 hr	N-DP-D07x	5.03	5.02	-0.01
25 yr 72 hr	N-DP-D07y	5.09	5.09	0
25 yr 72 hr	N-DP-D08x	5.1	5.1	0
25 yr 72 hr	N-DP-D08y	5.13	5.13	0
25 yr 72 hr	N-DP-D09	5.19	5.19	0
25 yr 72 hr	N-DP-D10	5.55	5.55	0
25 yr 72 hr	N-DP-E05	4.89	4.89	0
25 yr 72 hr	N-DP-E06	4.92	4.92	0
25 yr 72 hr	N-DP-E08	4.89	4.89	0
25 yr 72 hr	N-DP-F07	5.89	5.89	0
25 yr 72 hr	N-DP-F08	5.13	5.13	0
25 yr 72 hr	N-DP-F09	5.37	5.37	0
25 yr 72 hr	N-DP-G05	4.58	4.52	-0.06
25 yr 72 hr	N-DP-G06	4.58	4.52	-0.06

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DP-G07	4.58	4.52	-0.06
25 yr 72 hr	N-DP-G07x	4.57	4.5	-0.07
25 yr 72 hr	N-DP-G08	4.62	4.58	-0.04
25 yr 72 hr	N-DP-G08x	4.58	4.52	-0.06
25 yr 72 hr	N-DP-H04	4.58	4.53	-0.05
25 yr 72 hr	N-DP-H05	4.58	4.52	-0.06
25 yr 72 hr	N-DP-H05x	4.58	4.52	-0.06
25 yr 72 hr	N-DP-H06	4.57	4.51	-0.06
25 yr 72 hr	N-DP-H06x	4.58	4.52	-0.06
25 yr 72 hr	N-DP-K07	4.58	4.52	-0.06
25 yr 72 hr	N-DP-M10	5.26	5.26	0
25 yr 72 hr	N-DP-M11	5.31	5.32	0.01
25 yr 72 hr	N-DP-M12	5.38	5.38	0
25 yr 72 hr	N-DP-N10	5.12	5.12	0
25 yr 72 hr	N-DP-O10	4.88	4.89	0.01
25 yr 72 hr	N-DP-O11	4.89	4.89	0
25 yr 72 hr	N-DP-P06	4.64	4.64	0
25 yr 72 hr	N-DP-Y03	5.12	5.12	0
25 yr 72 hr	N-DP-Z12	4.4	4.39	-0.01
25 yr 72 hr	N-DQ-A01	4.55	4.46	-0.09
25 yr 72 hr	N-E01	2.93	2.92	-0.01
25 yr 72 hr	N-E02	3.39	2.3	-1.09
25 yr 72 hr	N-E03	4.02	4.02	0
25 yr 72 hr	N-E07	4.54	4.54	0
25 yr 72 hr	N-E08	3.82	3.82	0
25 yr 72 hr	N-E10	3.74	3.74	0
25 yr 72 hr	N-E11	2.57	2.56	-0.01
25 yr 72 hr	N-EA	1.59	1.59	0
25 yr 72 hr	N-EA-A01	3.86	2.36	-1.5
25 yr 72 hr	N-EA-A02	3.86	2.4	-1.46
25 yr 72 hr	N-EB	1.59	1.59	0
25 yr 72 hr	N-EB-A01	3.03	2.23	-0.8
25 yr 72 hr	N-EC	1.59	1.59	0
25 yr 72 hr	N-EC-A01	3.11	2.23	-0.88
25 yr 72 hr	N-ED	1.59	1.59	0
25 yr 72 hr	N-ED-A01	3.63	2.24	-1.39
25 yr 72 hr	N-ED-A02	3.64	2.28	-1.36
25 yr 72 hr	N-ED-A03	3.64	2.3	-1.34
25 yr 72 hr	N-EE	1.59	1.59	0
25 yr 72 hr	N-EE-A01	3.71	2.18	-1.53
25 yr 72 hr	N-EF	1.59	1.59	0
25 yr 72 hr	N-EF-A01	3.71	1.92	-1.79
25 yr 72 hr	N-EG	1.59	1.59	0
25 yr 72 hr	N-EG-A01	3.46	2.28	-1.18

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-EG-A02	3.66	2.28	-1.38
25 yr 72 hr	N-EH	1.59	1.59	0
25 yr 72 hr	N-EH-A01	2.02	2.19	0.17
25 yr 72 hr	N-EI	1.59	1.59	0
25 yr 72 hr	N-EJ	1.59	1.59	0
25 yr 72 hr	N-EJ-A01	1.65	1.65	0
25 yr 72 hr	N-EK	1.59	1.59	0
25 yr 72 hr	N-EK-A01	3.76	3.76	0
25 yr 72 hr	N-EL	1.59	1.59	0
25 yr 72 hr	N-EL-A01	3.04	3.03	-0.01
25 yr 72 hr	N-EM	1.59	1.59	0
25 yr 72 hr	N-EM-A01	2.83	2.74	-0.09
25 yr 72 hr	N-EM-A02	2.74	2.74	0
25 yr 72 hr	N-EM-A03	2.57	2.57	0
25 yr 72 hr	N-EN	1.59	1.59	0
25 yr 72 hr	N-EN-A01	2.92	2.71	-0.21
25 yr 72 hr	N-EO	1.59	1.59	0
25 yr 72 hr	N-EO-A01	2.46	2.39	-0.07
25 yr 72 hr	N-EP	1.59	1.59	0
25 yr 72 hr	N-EP-A01	2.56	2.56	0
25 yr 72 hr	N-EQ	1.59	1.59	0
25 yr 72 hr	N-EQ-A01	1.67	1.67	0
25 yr 72 hr	N-ER	1.59	1.59	0
25 yr 72 hr	N-ES	1.59	1.59	0
25 yr 72 hr	N-ET	1.59	1.59	0
25 yr 72 hr	N-ET-A01	1.6	1.6	0
25 yr 72 hr	NAltAdd_01	#N/A	2.2	#N/A

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Area BCD Improvement Projects Unselected Alternative (3BCD)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	9thSt-Node	#N/A	1.64	#N/A
10 yr 1 hr	N-BA	1.59	1.59	0
10 yr 1 hr	N-BA-A01	3.33	1.63	-1.7
10 yr 1 hr	N-BA-A02	3.37	1.64	-1.73
10 yr 1 hr	N-BA-A03	3.4	1.67	-1.73
10 yr 1 hr	N-BA-A03x	3.37	1.65	-1.72
10 yr 1 hr	N-BA-A04	3.46	1.69	-1.77
10 yr 1 hr	N-BA-A04x	3.4	1.67	-1.73
10 yr 1 hr	N-BA-A05	3.46	1.7	-1.76
10 yr 1 hr	N-BA-A06	3.58	1.85	-1.73
10 yr 1 hr	N-BA-A07	3.65	2	-1.65
10 yr 1 hr	N-BA-A07x	3.61	1.86	-1.75
10 yr 1 hr	N-BA-A08	3.76	2.04	-1.72
10 yr 1 hr	N-BA-A08x	3.65	2.02	-1.63
10 yr 1 hr	N-BA-A09	3.91	4.11	0.2
10 yr 1 hr	N-BA-B02	3.26	1.63	-1.63
10 yr 1 hr	N-BA-B03	3.26	1.65	-1.61
10 yr 1 hr	N-BA-B04	3.25	1.66	-1.59
10 yr 1 hr	N-BA-C03	3.33	1.64	-1.69
10 yr 1 hr	N-BA-C04	3.32	1.64	-1.68
10 yr 1 hr	N-BA-D05	3.48	1.69	-1.79
10 yr 1 hr	N-BA-D06	3.49	1.72	-1.77
10 yr 1 hr	N-BA-D07	3.65	1.82	-1.83
10 yr 1 hr	N-BA-D08	3.72	1.82	-1.9
10 yr 1 hr	N-BA-E09	3.76	2.26	-1.5
10 yr 1 hr	N-BA-F09	3.87	2.07	-1.8
10 yr 1 hr	N-BA-K04	3.39	2.97	-0.42
10 yr 1 hr	N-BA-K05	3.41	3.15	-0.26
10 yr 1 hr	N-BA-K06	3.6	3.38	-0.22
10 yr 1 hr	N-BA-K08	5.06	5.07	0.01
10 yr 1 hr	N-BA-L06	3.54	3.1	-0.44
10 yr 1 hr	N-BA-Q05	3.38	1.7	-1.68
10 yr 1 hr	N-BA-Q06	3.38	1.72	-1.66
10 yr 1 hr	N-BA-Q06x	3.38	1.68	-1.7
10 yr 1 hr	N-BA-Q07	3.38	1.76	-1.62
10 yr 1 hr	N-BA-Q07x	3.37	1.74	-1.63
10 yr 1 hr	N-BA-Q08	3.39	1.78	-1.61
10 yr 1 hr	N-BA-R06	3.39	1.79	-1.6
10 yr 1 hr	N-BA-R07	3.38	1.79	-1.59
10 yr 1 hr	N-BA-R07x	3.4	1.8	-1.6
10 yr 1 hr	N-BA-R08	3.38	1.78	-1.6
10 yr 1 hr	N-BA-R08x	3.39	1.79	-1.6
10 yr 1 hr	N-BA-R09	3.38	1.78	-1.6
10 yr 1 hr	N-BA-R10	3.38	1.76	-1.62

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA-R11	3.37	1.74	-1.63
10 yr 1 hr	N-BA-S06a	3.68	3.2	-0.48
10 yr 1 hr	N-BA-T07	3.69	2.09	-1.6
10 yr 1 hr	N-BA-T08	3.68	1.92	-1.76
10 yr 1 hr	N-BA-T08x	3.69	2.13	-1.56
10 yr 1 hr	N-BA-T09	3.4	1.71	-1.69
10 yr 1 hr	N-BA-T09x	3.68	1.92	-1.76
10 yr 1 hr	N-BA-T10	3.4	1.71	-1.69
10 yr 1 hr	N-BA-U02	3.32	1.64	-1.68
10 yr 1 hr	N-BA-U03	3.33	1.65	-1.68
10 yr 1 hr	N-BA-V07	3.75	3.73	-0.02
10 yr 1 hr	N-BA-W08	4.19	4.14	-0.05
10 yr 1 hr	N-BA-W09A	4.2	4.15	-0.05
10 yr 1 hr	N-BA-W09B	4.17	4.12	-0.05
10 yr 1 hr	N-BB	1.59	1.59	0
10 yr 1 hr	N-BB-A01	3.32	1.69	-1.63
10 yr 1 hr	N-BB-A02	3.33	1.73	-1.6
10 yr 1 hr	N-BB-A03	3.31	1.8	-1.51
10 yr 1 hr	N-BB-A04	3.32	1.8	-1.52
10 yr 1 hr	N-BC	1.59	1.59	0
10 yr 1 hr	N-BC-A01	2.39	2.55	0.16
10 yr 1 hr	N-BC-A02	4.78	3.04	-1.74
10 yr 1 hr	N-BD	1.59	1.59	0
10 yr 1 hr	N-BD-A01	3.33	1.6	-1.73
10 yr 1 hr	N-BD-A02	3.36	1.64	-1.72
10 yr 1 hr	N-BD-A02x	3.37	1.64	-1.73
10 yr 1 hr	N-BD-A03	3.37	1.65	-1.72
10 yr 1 hr	N-BD-A05	3.37	1.67	-1.7
10 yr 1 hr	N-BD-B02	3.33	1.6	-1.73
10 yr 1 hr	N-BD-B03	3.32	1.63	-1.69
10 yr 1 hr	N-BD-B04	3.32	2.5	-0.82
10 yr 1 hr	N-BD-B04x	3.32	1.64	-1.68
10 yr 1 hr	N-BE	1.59	1.59	0
10 yr 1 hr	N-BE-A01	3.31	1.63	-1.68
10 yr 1 hr	N-BE-A03	3.39	1.68	-1.71
10 yr 1 hr	N-BE-A04	3.4	1.69	-1.71
10 yr 1 hr	N-BF	1.59	1.59	0
10 yr 1 hr	N-BF-A01	3.9	3.75	-0.15
10 yr 1 hr	N-CA	1.59	1.59	0
10 yr 1 hr	N-CA-A01c	5.81	3.28	-2.53
10 yr 1 hr	N-CA-A01d	3.23	2.87	-0.36
10 yr 1 hr	N-CA-A02	3.35	3	-0.35
10 yr 1 hr	N-CA-A03	3.37	3.06	-0.31
10 yr 1 hr	N-CA-A04	3.4	3.21	-0.19

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-A05	3.41	3.31	-0.1
10 yr 1 hr	N-CA-A07	4.72	4.71	-0.01
10 yr 1 hr	N-CA-B03	3.36	3.02	-0.34
10 yr 1 hr	N-CA-B04	3.38	3.08	-0.3
10 yr 1 hr	N-CA-B07	4.35	4.31	-0.04
10 yr 1 hr	N-CA-C03	3.13	-0.74	-3.87
10 yr 1 hr	N-CA-C04	3.11	-0.72	-3.83
10 yr 1 hr	N-CA-C05	3.14	2.76	-0.38
10 yr 1 hr	N-CA-D06	3.62	3.63	0.01
10 yr 1 hr	N-CA-D07	3.62	3.64	0.02
10 yr 1 hr	N-CA-D07x	3.79	3.8	0.01
10 yr 1 hr	N-CA-D08	3.13	2.26	-0.87
10 yr 1 hr	N-CA-D08x	3.64	3.65	0.01
10 yr 1 hr	N-CA-D09x	3.13	2.6	-0.53
10 yr 1 hr	N-CA-E07	4.42	4.37	-0.05
10 yr 1 hr	N-CA-E08	4.43	4.37	-0.06
10 yr 1 hr	N-CA-E09x	4.57	4.38	-0.19
10 yr 1 hr	N-CA-F04	3.37	-0.52	-3.89
10 yr 1 hr	N-CA-F05	3.09	-0.5	-3.59
10 yr 1 hr	N-CA-F05x	3.19	-0.53	-3.72
10 yr 1 hr	N-CA-F06	3.08	-0.52	-3.6
10 yr 1 hr	N-CA-F06x	3.07	-0.49	-3.56
10 yr 1 hr	N-CA-F07	3.08	1.6	-1.48
10 yr 1 hr	N-CA-F07x	3.07	-0.49	-3.56
10 yr 1 hr	N-CA-F08	3.09	1.84	-1.25
10 yr 1 hr	N-CA-F09	3.09	1.82	-1.27
10 yr 1 hr	N-CA-F09x	3.09	1.84	-1.25
10 yr 1 hr	N-CA-F10	3.1	1.77	-1.33
10 yr 1 hr	N-CA-F11	3.1	1.74	-1.36
10 yr 1 hr	N-CA-F11x	3.09	1.8	-1.29
10 yr 1 hr	N-CA-F12	3.1	1.71	-1.39
10 yr 1 hr	N-CA-F12x	3.1	1.76	-1.34
10 yr 1 hr	N-CA-G08	3.1	1.93	-1.17
10 yr 1 hr	N-CA-G09	3.1	2.36	-0.74
10 yr 1 hr	N-CA-G10	3.39	3.12	-0.27
10 yr 1 hr	N-CA-G11x	3.37	3.12	-0.25
10 yr 1 hr	N-CA-H09	3.1	1.88	-1.22
10 yr 1 hr	N-CA-H10	3.1	1.89	-1.21
10 yr 1 hr	N-CA-H10x	3.1	1.88	-1.22
10 yr 1 hr	N-CA-H11	3.12	1.98	-1.14
10 yr 1 hr	N-CA-H11x	3.1	1.86	-1.24
10 yr 1 hr	N-CA-H12	3.12	2.03	-1.09
10 yr 1 hr	N-CA-H13	3.24	2.24	-1
10 yr 1 hr	N-CA-H14	3.32	2.34	-0.98

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-I12	3.12	1.97	-1.15
10 yr 1 hr	N-CA-I13	3.12	1.95	-1.17
10 yr 1 hr	N-CA-I14	3.12	1.9	-1.22
10 yr 1 hr	N-CA-J14	3.26	2.38	-0.88
10 yr 1 hr	N-CA-J15x	3.3	2.42	-0.88
10 yr 1 hr	N-CA-K03	3.36	2.88	-0.48
10 yr 1 hr	N-CA-L04	3.38	2.93	-0.45
10 yr 1 hr	N-CA-L05	3.52	2.95	-0.57
10 yr 1 hr	N-CA-M06	3.55	2.98	-0.57
10 yr 1 hr	N-CA-N05	3.57	3.54	-0.03
10 yr 1 hr	N-CA-O08	4.93	4.74	-0.19
10 yr 1 hr	N-CA-S05	3.23	0.01	-3.22
10 yr 1 hr	N-CA-T08	3.06	1.6	-1.46
10 yr 1 hr	N-CA-T09	3.06	1.6	-1.46
10 yr 1 hr	N-CB	1.59	1.59	0
10 yr 1 hr	N-CB-A01	3	-0.79	-3.79
10 yr 1 hr	N-CB-Added	#N/A	-0.8	#N/A
10 yr 1 hr	N-CC	1.59	1.59	0
10 yr 1 hr	N-CC-A01	2.81	1.59	-1.22
10 yr 1 hr	N-CC-A02	2.84	1.71	-1.13
10 yr 1 hr	N-CC-A03	3.06	1.74	-1.32
10 yr 1 hr	N-CE	1.59	1.59	0
10 yr 1 hr	N-CE-A01	3.1	1.73	-1.37
10 yr 1 hr	N-CE-A02	3.1	1.79	-1.31
10 yr 1 hr	N-CE-A03	3.1	1.81	-1.29
10 yr 1 hr	N-CF	1.59	1.59	0
10 yr 1 hr	N-CF-A01	3.12	1.73	-1.39
10 yr 1 hr	N-CF-A02	3.12	1.81	-1.31
10 yr 1 hr	N-CF-A03x	3.12	1.81	-1.31
10 yr 1 hr	N-CG	1.59	1.59	0
10 yr 1 hr	N-CG-A01	3.12	2.63	-0.49
10 yr 1 hr	N-CG-A02x	3.12	2.83	-0.29
10 yr 1 hr	N-CG-A03x	3.26	2.99	-0.27
10 yr 1 hr	N-CH	1.59	1.59	0
10 yr 1 hr	N-CH-A01b	1.81	-2.81	-4.62
10 yr 1 hr	N-CH-A02	2.23	-2.71	-4.94
10 yr 1 hr	N-CH-A03	3.64	-1.67	-5.31
10 yr 1 hr	N-CH-A04	3.76	-1	-4.76
10 yr 1 hr	N-CH-Added	#N/A	-2.82	#N/A
10 yr 1 hr	N-CH-B02	2.87	1.85	-1.02
10 yr 1 hr	N-CH-B03	3.84	2.21	-1.63
10 yr 1 hr	N-CH-B03x	2.89	1.87	-1.02
10 yr 1 hr	N-CH-B04	3.91	3.81	-0.1
10 yr 1 hr	N-CH-B04x	4.04	2.42	-1.62

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CH-B05	4.72	4.48	-0.24
10 yr 1 hr	N-CH-B05x	3.99	3.85	-0.14
10 yr 1 hr	N-CH-B06	4.88	4.86	-0.02
10 yr 1 hr	N-CH-B06x	4.82	4.78	-0.04
10 yr 1 hr	N-CH-B07	5.89	5.88	-0.01
10 yr 1 hr	N-CH-C04	3.75	-0.79	-4.54
10 yr 1 hr	N-CH-C05	3.77	2.46	-1.31
10 yr 1 hr	N-CH-C05x1	3.77	-0.65	-4.42
10 yr 1 hr	N-CH-C05x2	3.77	-0.78	-4.55
10 yr 1 hr	N-CH-C05x3	3.77	-0.75	-4.52
10 yr 1 hr	N-CH-C06	3.78	2.51	-1.27
10 yr 1 hr	N-CH-C06x	3.77	2.47	-1.3
10 yr 1 hr	N-CH-C07x	3.77	2.52	-1.25
10 yr 1 hr	N-CH-D05	3.77	-0.71	-4.48
10 yr 1 hr	N-CH-D06	3.77	-0.56	-4.33
10 yr 1 hr	N-CH-D08x	3.77	0.22	-3.55
10 yr 1 hr	N-CH-E06	3.78	2.52	-1.26
10 yr 1 hr	N-CH-E07	3.78	2.52	-1.26
10 yr 1 hr	N-CH-F07	3.78	2.53	-1.25
10 yr 1 hr	N-CH-F08	3.78	2.53	-1.25
10 yr 1 hr	N-CH-G07	3.77	-0.25	-4.02
10 yr 1 hr	N-CH-G08	3.77	0.04	-3.73
10 yr 1 hr	N-CH-G09	3.77	0.12	-3.65
10 yr 1 hr	N-CH-G10	3.77	0.21	-3.56
10 yr 1 hr	N-CH-G11	3.77	0.23	-3.54
10 yr 1 hr	N-CH-I04	3.73	0.11	-3.62
10 yr 1 hr	N-CH-I05x1	3.76	0.14	-3.62
10 yr 1 hr	N-CH-I05x2	3.76	0.94	-2.82
10 yr 1 hr	N-CH-I05x3	3.76	1.05	-2.71
10 yr 1 hr	N-CH-I05x4	3.76	0.13	-3.63
10 yr 1 hr	N-CI	1.59	1.59	0
10 yr 1 hr	N-D10	3.77	0.24	-3.53
10 yr 1 hr	N-D16	2.53	2.53	0
10 yr 1 hr	N-D19	4.78	4.67	-0.11
10 yr 1 hr	N-D20	4.77	4.44	-0.33
10 yr 1 hr	N-D22	4.79	4.75	-0.04
10 yr 1 hr	N-D30	4.76	4.23	-0.53
10 yr 1 hr	N-DA	1.59	1.59	0
10 yr 1 hr	N-DA-A01	3.36	1.73	-1.63
10 yr 1 hr	N-DB	1.59	1.59	0
10 yr 1 hr	N-DC	1.59	1.59	0
10 yr 1 hr	N-DI-A01	3.51	1.71	-1.8
10 yr 1 hr	N-DI-A02	3.52	1.84	-1.68
10 yr 1 hr	N-DI-B04	4.27	2.13	-2.14

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DI-B05	4.03	2.21	-1.82
10 yr 1 hr	N-DI-B05x	4.71	2.13	-2.58
10 yr 1 hr	N-DI-B06	4.04	2.29	-1.75
10 yr 1 hr	N-DI-B07	4.72	2.39	-2.33
10 yr 1 hr	N-DI-B08	4.72	2.5	-2.22
10 yr 1 hr	N-DI-B09	4.73	2.7	-2.03
10 yr 1 hr	N-DI-B10	4.75	2.85	-1.9
10 yr 1 hr	N-DI-B10x	4.73	2.71	-2.02
10 yr 1 hr	N-DI-B11	4.74	2.85	-1.89
10 yr 1 hr	N-DI-C03	3.55	1.94	-1.61
10 yr 1 hr	N-DI-C04	4.78	4.59	-0.19
10 yr 1 hr	N-DI-C05	4.52	3.2	-1.32
10 yr 1 hr	N-DP	4.17	1.13	-3.04
10 yr 1 hr	N-DP-A01	4.32	1.61	-2.71
10 yr 1 hr	N-DP-A02	4.36	2.57	-1.79
10 yr 1 hr	N-DP-A04	4.39	3.14	-1.25
10 yr 1 hr	N-DP-A07	4.77	3.28	-1.49
10 yr 1 hr	N-DP-A08	4.77	3.28	-1.49
10 yr 1 hr	N-DP-A09	4.77	3.05	-1.72
10 yr 1 hr	N-DP-A09x	4.77	3.29	-1.48
10 yr 1 hr	N-DP-A10	4.76	3.1	-1.66
10 yr 1 hr	N-DP-A11x	4.76	3.1	-1.66
10 yr 1 hr	N-DP-B2	4.35	2.15	-2.2
10 yr 1 hr	N-DP-C02	4.37	2.23	-2.14
10 yr 1 hr	N-DP-C03	3.36	1.74	-1.62
10 yr 1 hr	N-DP-C03x	4.37	2.25	-2.12
10 yr 1 hr	N-DP-D02	4.43	2.89	-1.54
10 yr 1 hr	N-DP-D03x	4.82	4.74	-0.08
10 yr 1 hr	N-DP-D04	4.59	3.41	-1.18
10 yr 1 hr	N-DP-D05x	4.64	3.67	-0.97
10 yr 1 hr	N-DP-D06x	4.71	3.89	-0.82
10 yr 1 hr	N-DP-D07x	4.81	4.16	-0.65
10 yr 1 hr	N-DP-D08x	4.89	4.28	-0.61
10 yr 1 hr	N-DP-D09	5.01	4.53	-0.48
10 yr 1 hr	N-DP-D10	5.4	5.32	-0.08
10 yr 1 hr	N-DP-E05	4.74	4.12	-0.62
10 yr 1 hr	N-DP-E06	4.86	4.85	-0.01
10 yr 1 hr	N-DP-E08	4.78	4.65	-0.13
10 yr 1 hr	N-DP-F07	5.1	5.01	-0.09
10 yr 1 hr	N-DP-F08	4.94	4.62	-0.32
10 yr 1 hr	N-DP-F09	4.96	4.95	-0.01
10 yr 1 hr	N-DP-G05	4.36	3.43	-0.93
10 yr 1 hr	N-DP-G06	4.36	2.51	-1.85
10 yr 1 hr	N-DP-G07	4.36	2.84	-1.52

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DP-G07x	4.35	2.51	-1.84
10 yr 1 hr	N-DP-G08	4.39	3.23	-1.16
10 yr 1 hr	N-DP-G08x	4.36	2.85	-1.51
10 yr 1 hr	N-DP-H04	4.36	2.58	-1.78
10 yr 1 hr	N-DP-H05	4.36	2.61	-1.75
10 yr 1 hr	N-DP-H05x	4.36	3.79	-0.57
10 yr 1 hr	N-DP-H06	4.35	2.14	-2.21
10 yr 1 hr	N-DP-H06x	4.36	4.05	-0.31
10 yr 1 hr	N-DP-K07	4.36	2.14	-2.22
10 yr 1 hr	N-DP-M10	5.11	4.28	-0.83
10 yr 1 hr	N-DP-M11	5.2	4.23	-0.97
10 yr 1 hr	N-DP-M12	5.25	5.12	-0.13
10 yr 1 hr	N-DP-N10	4.89	4.35	-0.54
10 yr 1 hr	N-DP-O10	4.77	3.14	-1.63
10 yr 1 hr	N-DP-O11	4.88	3.3	-1.58
10 yr 1 hr	N-DP-P06	4.6	4.35	-0.25
10 yr 1 hr	N-DP-Y03	5.11	5.11	0
10 yr 1 hr	N-DP-Z12	4.26	4.09	-0.17
10 yr 1 hr	N-DQ-A01	4.33	2.08	-2.25
10 yr 1 hr	N-DQ-A02	4.34	3.14	-1.2
10 yr 1 hr	N-DQ-A03	4.33	2.03	-2.3
10 yr 1 hr	N-DQ-A03x	2.94	1.8	-1.14
10 yr 1 hr	N-DQ-A04	5.32	5.32	0
10 yr 1 hr	N-DQ-A05	4.03	1.92	-2.11
10 yr 1 hr	N-DQ-A06	4.33	3.37	-0.96
10 yr 1 hr	N-DQ-A07	4.33	3.4	-0.93
10 yr 1 hr	N-DQ-A08	4.33	3.45	-0.88
10 yr 1 hr	N-E01	2.9	2.9	0
10 yr 1 hr	N-E02	3.35	3.35	0
10 yr 1 hr	N-E03	4	4	0
10 yr 1 hr	N-E07	4.49	4.49	0
10 yr 1 hr	N-E08	3.78	3.78	0
10 yr 1 hr	N-E10	3.71	3.71	0
10 yr 1 hr	N-E11	1.83	1.86	0.03
10 yr 1 hr	N-EA	1.59	1.59	0
10 yr 1 hr	N-EA-A01	3.81	3.81	0
10 yr 1 hr	N-EA-A02	3.81	3.81	0
10 yr 1 hr	N-EB	1.59	1.59	0
10 yr 1 hr	N-EB-A01	2.52	2.52	0
10 yr 1 hr	N-EC	1.59	1.59	0
10 yr 1 hr	N-EC-A01	2.69	2.69	0
10 yr 1 hr	N-ED	1.59	1.59	0
10 yr 1 hr	N-ED-A01	3.24	3.24	0
10 yr 1 hr	N-ED-A02	3.41	3.41	0

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Area BCD Improvement Projects Unselected Alternative (3BCD)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-ED-A03	3.51	3.51	0
10 yr 1 hr	N-EE	1.59	1.59	0
10 yr 1 hr	N-EE-A01	3.66	3.66	0
10 yr 1 hr	N-EF	1.59	1.59	0
10 yr 1 hr	N-EF-A01	3.11	3.11	0
10 yr 1 hr	N-EG	1.59	1.59	0
10 yr 1 hr	N-EG-A01	3.43	3.43	0
10 yr 1 hr	N-EG-A02	3.62	3.62	0
10 yr 1 hr	N-EH	1.59	1.59	0
10 yr 1 hr	N-EH-A01	1.77	1.77	0
10 yr 1 hr	N-EI	1.59	1.59	0
10 yr 1 hr	N-EJ	1.59	1.59	0
10 yr 1 hr	N-EJ-A01	1.61	1.61	0
10 yr 1 hr	N-EK	1.59	1.59	0
10 yr 1 hr	N-EK-A01	3.68	3.68	0
10 yr 1 hr	N-EL	1.59	1.59	0
10 yr 1 hr	N-EL-A01	3.01	3.01	0
10 yr 1 hr	N-EM	1.59	1.59	0
10 yr 1 hr	N-EM-A01	2.63	2.63	0
10 yr 1 hr	N-EM-A02	2.61	2.61	0
10 yr 1 hr	N-EM-A03	2	2	0
10 yr 1 hr	N-EN	1.59	1.59	0
10 yr 1 hr	N-EN-A01	2.83	2.83	0
10 yr 1 hr	N-EO	1.59	1.59	0
10 yr 1 hr	N-EO-A01	2.22	2.22	0
10 yr 1 hr	N-EP	1.59	1.59	0
10 yr 1 hr	N-EP-A01	1.98	1.98	0
10 yr 1 hr	N-EQ	1.59	1.59	0
10 yr 1 hr	N-EQ-A01	1.65	1.65	0
10 yr 1 hr	N-ER	1.59	1.59	0
10 yr 1 hr	N-ES	1.59	1.59	0
10 yr 1 hr	N-ET	1.59	1.59	0
10 yr 1 hr	N-ET-A01	1.59	1.59	0
10 yr 1 hr	NZA-0110	#N/A	1.62	#N/A
10 yr 1 hr	NZA-0120	#N/A	1.62	#N/A
10 yr 1 hr	NZA-0130	#N/A	1.61	#N/A
10 yr 1 hr	NZA-0150	#N/A	1.63	#N/A
10 yr 1 hr	NZA-0160	#N/A	1.62	#N/A
10 yr 1 hr	Trunkline-Junction-1	#N/A	2.72	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	9thSt-Node	#N/A	1.89	#N/A
25 yr 72 hr	N-BA	1.59	1.59	0
25 yr 72 hr	N-BA-A01	3.55	1.65	-1.9
25 yr 72 hr	N-BA-A02	3.6	1.69	-1.91
25 yr 72 hr	N-BA-A03	3.64	1.75	-1.89
25 yr 72 hr	N-BA-A03x	3.6	1.69	-1.91
25 yr 72 hr	N-BA-A04	3.71	1.82	-1.89
25 yr 72 hr	N-BA-A04x	3.63	1.74	-1.89
25 yr 72 hr	N-BA-A05	3.72	1.85	-1.87
25 yr 72 hr	N-BA-A06	3.78	1.99	-1.79
25 yr 72 hr	N-BA-A07	3.82	2.18	-1.64
25 yr 72 hr	N-BA-A07x	3.81	2	-1.81
25 yr 72 hr	N-BA-A08	3.83	2.22	-1.61
25 yr 72 hr	N-BA-A08x	3.82	2.58	-1.24
25 yr 72 hr	N-BA-A09	4.01	4.29	0.28
25 yr 72 hr	N-BA-B02	3.41	1.65	-1.76
25 yr 72 hr	N-BA-B03	3.41	1.67	-1.74
25 yr 72 hr	N-BA-B04	3.39	1.68	-1.71
25 yr 72 hr	N-BA-C03	3.57	1.68	-1.89
25 yr 72 hr	N-BA-C04	3.57	1.68	-1.89
25 yr 72 hr	N-BA-D05	3.73	1.83	-1.9
25 yr 72 hr	N-BA-D06	3.75	2.06	-1.69
25 yr 72 hr	N-BA-D07	3.85	2.42	-1.43
25 yr 72 hr	N-BA-D08	3.89	2.41	-1.48
25 yr 72 hr	N-BA-E09	3.83	2.45	-1.38
25 yr 72 hr	N-BA-F09	3.88	2.25	-1.63
25 yr 72 hr	N-BA-K04	3.69	3.17	-0.52
25 yr 72 hr	N-BA-K05	3.72	3.43	-0.29
25 yr 72 hr	N-BA-K06	3.78	3.69	-0.09
25 yr 72 hr	N-BA-K08	5.08	5.08	0
25 yr 72 hr	N-BA-L06	3.76	3.51	-0.25
25 yr 72 hr	N-BA-Q05	3.67	2.39	-1.28
25 yr 72 hr	N-BA-Q06	3.66	2.4	-1.26
25 yr 72 hr	N-BA-Q06x	3.67	2.32	-1.35
25 yr 72 hr	N-BA-Q07	3.68	2.65	-1.03
25 yr 72 hr	N-BA-Q07x	3.66	2.39	-1.27
25 yr 72 hr	N-BA-Q08	3.68	2.81	-0.87
25 yr 72 hr	N-BA-R06	3.69	2.98	-0.71
25 yr 72 hr	N-BA-R07	3.68	2.65	-1.03
25 yr 72 hr	N-BA-R07x	3.7	3.11	-0.59
25 yr 72 hr	N-BA-R08	3.66	2.31	-1.35
25 yr 72 hr	N-BA-R08x	3.68	2.65	-1.03
25 yr 72 hr	N-BA-R09	3.67	2.22	-1.45
25 yr 72 hr	N-BA-R10	3.67	2.07	-1.6

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA-R11	3.65	1.94	-1.71
25 yr 72 hr	N-BA-S06a	3.94	3.54	-0.4
25 yr 72 hr	N-BA-T07	3.73	2.25	-1.48
25 yr 72 hr	N-BA-T08	3.72	2.03	-1.69
25 yr 72 hr	N-BA-T08x	3.73	2.28	-1.45
25 yr 72 hr	N-BA-T09	3.69	1.79	-1.9
25 yr 72 hr	N-BA-T09x	3.71	2.04	-1.67
25 yr 72 hr	N-BA-T10	3.69	1.79	-1.9
25 yr 72 hr	N-BA-U02	3.55	1.67	-1.88
25 yr 72 hr	N-BA-U03	3.56	1.7	-1.86
25 yr 72 hr	N-BA-V07	3.8	3.78	-0.02
25 yr 72 hr	N-BA-W08	4.54	4.5	-0.04
25 yr 72 hr	N-BA-W09A	4.55	4.52	-0.03
25 yr 72 hr	N-BA-W09B	4.51	4.47	-0.04
25 yr 72 hr	N-BB	1.59	1.59	0
25 yr 72 hr	N-BB-A01	3.6	1.79	-1.81
25 yr 72 hr	N-BB-A02	3.59	1.87	-1.72
25 yr 72 hr	N-BB-A03	3.57	1.92	-1.65
25 yr 72 hr	N-BB-A04	3.58	1.93	-1.65
25 yr 72 hr	N-BC	1.59	1.59	0
25 yr 72 hr	N-BC-A01	2.54	2.66	0.12
25 yr 72 hr	N-BC-A02	4.82	3.24	-1.58
25 yr 72 hr	N-BD	1.59	1.59	0
25 yr 72 hr	N-BD-A01	3.59	1.62	-1.97
25 yr 72 hr	N-BD-A02	3.64	1.91	-1.73
25 yr 72 hr	N-BD-A02x	3.65	1.95	-1.7
25 yr 72 hr	N-BD-A03	3.65	2.02	-1.63
25 yr 72 hr	N-BD-A05	3.64	2.2	-1.44
25 yr 72 hr	N-BD-B02	3.59	1.63	-1.96
25 yr 72 hr	N-BD-B03	3.57	1.78	-1.79
25 yr 72 hr	N-BD-B04	3.64	2.68	-0.96
25 yr 72 hr	N-BD-B04x	3.57	1.9	-1.67
25 yr 72 hr	N-BE	1.59	1.59	0
25 yr 72 hr	N-BE-A01	3.56	1.66	-1.9
25 yr 72 hr	N-BE-A03	3.68	1.76	-1.92
25 yr 72 hr	N-BE-A04	3.68	1.79	-1.89
25 yr 72 hr	N-BF	1.59	1.59	0
25 yr 72 hr	N-BF-A01	4.06	3.95	-0.11
25 yr 72 hr	N-CA	1.59	1.59	0
25 yr 72 hr	N-CA-A01c	5.81	3.28	-2.53
25 yr 72 hr	N-CA-A01d	3.45	3.09	-0.36
25 yr 72 hr	N-CA-A02	3.58	3.22	-0.36
25 yr 72 hr	N-CA-A03	3.59	3.25	-0.34
25 yr 72 hr	N-CA-A04	3.6	3.34	-0.26

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-A05	3.6	3.39	-0.21
25 yr 72 hr	N-CA-A07	5.04	5.01	-0.03
25 yr 72 hr	N-CA-B03	3.59	3.24	-0.35
25 yr 72 hr	N-CA-B04	3.6	3.27	-0.33
25 yr 72 hr	N-CA-B07	4.7	4.61	-0.09
25 yr 72 hr	N-CA-C03	3.38	0.15	-3.23
25 yr 72 hr	N-CA-C04	3.35	0.43	-2.92
25 yr 72 hr	N-CA-C05	3.39	2.85	-0.54
25 yr 72 hr	N-CA-D06	3.64	3.65	0.01
25 yr 72 hr	N-CA-D07	3.65	3.66	0.01
25 yr 72 hr	N-CA-D07x	3.81	3.82	0.01
25 yr 72 hr	N-CA-D08	3.4	2.51	-0.89
25 yr 72 hr	N-CA-D08x	3.66	3.66	0
25 yr 72 hr	N-CA-D09x	3.4	2.66	-0.74
25 yr 72 hr	N-CA-E07	4.8	4.73	-0.07
25 yr 72 hr	N-CA-E08	4.82	4.75	-0.07
25 yr 72 hr	N-CA-E09x	5.03	4.75	-0.28
25 yr 72 hr	N-CA-F04	3.56	1.5	-2.06
25 yr 72 hr	N-CA-F05	3.36	1.6	-1.76
25 yr 72 hr	N-CA-F05x	3.43	1.42	-2.01
25 yr 72 hr	N-CA-F06	3.35	1.42	-1.93
25 yr 72 hr	N-CA-F06x	3.33	1.6	-1.73
25 yr 72 hr	N-CA-F07	3.34	1.68	-1.66
25 yr 72 hr	N-CA-F07x	3.33	1.43	-1.9
25 yr 72 hr	N-CA-F08	3.36	1.98	-1.38
25 yr 72 hr	N-CA-F09	3.36	1.95	-1.41
25 yr 72 hr	N-CA-F09x	3.36	1.99	-1.37
25 yr 72 hr	N-CA-F10	3.37	1.88	-1.49
25 yr 72 hr	N-CA-F11	3.37	1.83	-1.54
25 yr 72 hr	N-CA-F11x	3.37	1.91	-1.46
25 yr 72 hr	N-CA-F12	3.37	1.78	-1.59
25 yr 72 hr	N-CA-F12x	3.37	1.86	-1.51
25 yr 72 hr	N-CA-G08	3.37	2.07	-1.3
25 yr 72 hr	N-CA-G09	3.38	2.6	-0.78
25 yr 72 hr	N-CA-G10	3.58	3.32	-0.26
25 yr 72 hr	N-CA-G11x	3.56	3.3	-0.26
25 yr 72 hr	N-CA-H09	3.38	2.06	-1.32
25 yr 72 hr	N-CA-H10	3.38	2.06	-1.32
25 yr 72 hr	N-CA-H10x	3.37	2.06	-1.31
25 yr 72 hr	N-CA-H11	3.39	2.19	-1.2
25 yr 72 hr	N-CA-H11x	3.38	2.03	-1.35
25 yr 72 hr	N-CA-H12	3.39	2.25	-1.14
25 yr 72 hr	N-CA-H13	3.4	2.53	-0.87
25 yr 72 hr	N-CA-H14	3.41	2.66	-0.75

Area BCD Improvement Projects Unselected Alternative (3BCD)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-I12	3.39	2.17	-1.22
25 yr 72 hr	N-CA-I13	3.39	2.15	-1.24
25 yr 72 hr	N-CA-I14	3.39	2.09	-1.3
25 yr 72 hr	N-CA-J14	3.4	2.64	-0.76
25 yr 72 hr	N-CA-J15x	3.4	2.68	-0.72
25 yr 72 hr	N-CA-K03	3.62	3.17	-0.45
25 yr 72 hr	N-CA-L04	3.6	3.26	-0.34
25 yr 72 hr	N-CA-L05	3.73	3.47	-0.26
25 yr 72 hr	N-CA-M06	3.77	3.48	-0.29
25 yr 72 hr	N-CA-N05	3.66	3.62	-0.04
25 yr 72 hr	N-CA-O08	4.98	4.98	0
25 yr 72 hr	N-CA-S05	3.41	1.5	-1.91
25 yr 72 hr	N-CA-T08	3.32	1.67	-1.65
25 yr 72 hr	N-CA-T09	3.32	1.67	-1.65
25 yr 72 hr	N-CB	1.59	1.59	0
25 yr 72 hr	N-CB-A01	3.19	-0.59	-3.78
25 yr 72 hr	N-CB-Added	#N/A	-0.8	#N/A
25 yr 72 hr	N-CC	1.59	1.59	0
25 yr 72 hr	N-CC-A01	3.15	1.61	-1.54
25 yr 72 hr	N-CC-A02	3.18	1.77	-1.41
25 yr 72 hr	N-CC-A03	3.31	1.84	-1.47
25 yr 72 hr	N-CE	1.59	1.59	0
25 yr 72 hr	N-CE-A01	3.37	1.81	-1.56
25 yr 72 hr	N-CE-A02	3.37	1.9	-1.47
25 yr 72 hr	N-CE-A03	3.37	1.95	-1.42
25 yr 72 hr	N-CF	1.59	1.59	0
25 yr 72 hr	N-CF-A01	3.38	1.82	-1.56
25 yr 72 hr	N-CF-A02	3.38	1.94	-1.44
25 yr 72 hr	N-CF-A03x	3.38	1.95	-1.43
25 yr 72 hr	N-CG	1.59	1.59	0
25 yr 72 hr	N-CG-A01	3.38	2.73	-0.65
25 yr 72 hr	N-CG-A02x	3.39	2.92	-0.47
25 yr 72 hr	N-CG-A03x	3.39	3.11	-0.28
25 yr 72 hr	N-CH	1.59	1.59	0
25 yr 72 hr	N-CH-A01b	1.88	0.44	-1.44
25 yr 72 hr	N-CH-A02	2.75	0.55	-2.2
25 yr 72 hr	N-CH-A03	3.93	0.79	-3.14
25 yr 72 hr	N-CH-A04	4.03	0.8	-3.23
25 yr 72 hr	N-CH-Added	#N/A	0.41	#N/A
25 yr 72 hr	N-CH-B02	2.96	1.92	-1.04
25 yr 72 hr	N-CH-B03	3.9	2.36	-1.54
25 yr 72 hr	N-CH-B03x	3.08	1.94	-1.14
25 yr 72 hr	N-CH-B04	3.94	3.84	-0.1
25 yr 72 hr	N-CH-B04x	4.12	2.61	-1.51

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CH-B05	4.75	4.53	-0.22
25 yr 72 hr	N-CH-B05x	4.05	3.89	-0.16
25 yr 72 hr	N-CH-B06	4.88	4.86	-0.02
25 yr 72 hr	N-CH-B06x	4.83	4.79	-0.04
25 yr 72 hr	N-CH-B07	5.93	5.93	0
25 yr 72 hr	N-CH-C04	4.02	1.02	-3
25 yr 72 hr	N-CH-C05	4.04	2.7	-1.34
25 yr 72 hr	N-CH-C05x1	4.03	1.05	-2.98
25 yr 72 hr	N-CH-C05x2	4.03	1.03	-3
25 yr 72 hr	N-CH-C05x3	4.03	1.03	-3
25 yr 72 hr	N-CH-C06	4.04	2.75	-1.29
25 yr 72 hr	N-CH-C06x	4.04	2.7	-1.34
25 yr 72 hr	N-CH-C07x	4.04	2.77	-1.27
25 yr 72 hr	N-CH-D05	4.03	1.08	-2.95
25 yr 72 hr	N-CH-D06	4.03	1.2	-2.83
25 yr 72 hr	N-CH-D08x	4.04	1.65	-2.39
25 yr 72 hr	N-CH-E06	4.04	2.76	-1.28
25 yr 72 hr	N-CH-E07	4.04	2.77	-1.27
25 yr 72 hr	N-CH-F07	4.05	2.77	-1.28
25 yr 72 hr	N-CH-F08	4.05	2.77	-1.28
25 yr 72 hr	N-CH-G07	4.03	1.25	-2.78
25 yr 72 hr	N-CH-G08	4.03	1.35	-2.68
25 yr 72 hr	N-CH-G09	4.02	1.37	-2.65
25 yr 72 hr	N-CH-G10	4.02	1.5	-2.52
25 yr 72 hr	N-CH-G11	4.03	1.52	-2.51
25 yr 72 hr	N-CH-I04	3.99	1.28	-2.71
25 yr 72 hr	N-CH-I05x1	4.02	1.29	-2.73
25 yr 72 hr	N-CH-I05x2	4.01	1.42	-2.59
25 yr 72 hr	N-CH-I05x3	4.01	1.5	-2.51
25 yr 72 hr	N-CH-I05x4	4.02	1.28	-2.74
25 yr 72 hr	N-CI	1.59	1.59	0
25 yr 72 hr	N-D10	4.03	1.68	-2.35
25 yr 72 hr	N-D16	2.55	2.55	0
25 yr 72 hr	N-D19	4.89	4.7	-0.19
25 yr 72 hr	N-D20	4.89	4.5	-0.39
25 yr 72 hr	N-D22	4.86	4.77	-0.09
25 yr 72 hr	N-D30	4.87	4.25	-0.62
25 yr 72 hr	N-DA	1.59	1.59	0
25 yr 72 hr	N-DA-A01	3.76	1.78	-1.98
25 yr 72 hr	N-DB	1.59	1.59	0
25 yr 72 hr	N-DC	1.59	1.59	0
25 yr 72 hr	N-DI-A01	3.98	1.75	-2.23
25 yr 72 hr	N-DI-A02	4.02	1.93	-2.09
25 yr 72 hr	N-DI-B04	4.51	2.32	-2.19

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DI-B05	4.32	2.43	-1.89
25 yr 72 hr	N-DI-B05x	4.83	2.33	-2.5
25 yr 72 hr	N-DI-B06	4.33	2.54	-1.79
25 yr 72 hr	N-DI-B07	4.83	2.67	-2.16
25 yr 72 hr	N-DI-B08	4.83	2.84	-1.99
25 yr 72 hr	N-DI-B09	4.85	3.12	-1.73
25 yr 72 hr	N-DI-B10	4.87	3.36	-1.51
25 yr 72 hr	N-DI-B10x	4.85	3.13	-1.72
25 yr 72 hr	N-DI-B11	4.86	3.36	-1.5
25 yr 72 hr	N-DI-C03	4.09	2.07	-2.02
25 yr 72 hr	N-DI-C04	4.86	4.74	-0.12
25 yr 72 hr	N-DI-C05	4.76	3.76	-1
25 yr 72 hr	N-DP	4.39	1.71	-2.68
25 yr 72 hr	N-DP-A01	4.54	2.19	-2.35
25 yr 72 hr	N-DP-A02	4.59	3.09	-1.5
25 yr 72 hr	N-DP-A04	4.62	3.56	-1.06
25 yr 72 hr	N-DP-A07	4.89	3.95	-0.94
25 yr 72 hr	N-DP-A08	4.89	3.94	-0.95
25 yr 72 hr	N-DP-A09	4.88	3.62	-1.26
25 yr 72 hr	N-DP-A09x	4.89	3.98	-0.91
25 yr 72 hr	N-DP-A10	4.88	3.7	-1.18
25 yr 72 hr	N-DP-A11x	4.88	3.72	-1.16
25 yr 72 hr	N-DP-B2	4.57	2.73	-1.84
25 yr 72 hr	N-DP-C02	4.59	2.82	-1.77
25 yr 72 hr	N-DP-C03	3.76	1.79	-1.97
25 yr 72 hr	N-DP-C03x	4.59	2.84	-1.75
25 yr 72 hr	N-DP-D02	4.64	3.47	-1.17
25 yr 72 hr	N-DP-D03x	4.87	4.81	-0.06
25 yr 72 hr	N-DP-D04	4.85	3.99	-0.86
25 yr 72 hr	N-DP-D05x	4.88	4.35	-0.53
25 yr 72 hr	N-DP-D06x	4.94	4.69	-0.25
25 yr 72 hr	N-DP-D07x	5.03	4.79	-0.24
25 yr 72 hr	N-DP-D08x	5.1	4.86	-0.24
25 yr 72 hr	N-DP-D09	5.19	4.99	-0.2
25 yr 72 hr	N-DP-D10	5.55	5.5	-0.05
25 yr 72 hr	N-DP-E05	4.89	4.35	-0.54
25 yr 72 hr	N-DP-E06	4.92	4.91	-0.01
25 yr 72 hr	N-DP-E08	4.89	4.69	-0.2
25 yr 72 hr	N-DP-F07	5.89	5.79	-0.1
25 yr 72 hr	N-DP-F08	5.13	4.87	-0.26
25 yr 72 hr	N-DP-F09	5.37	5.11	-0.26
25 yr 72 hr	N-DP-G05	4.58	3.66	-0.92
25 yr 72 hr	N-DP-G06	4.58	3.1	-1.48
25 yr 72 hr	N-DP-G07	4.58	3.51	-1.07

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DP-G07x	4.57	3.1	-1.47
25 yr 72 hr	N-DP-G08	4.62	3.97	-0.65
25 yr 72 hr	N-DP-G08x	4.58	3.51	-1.07
25 yr 72 hr	N-DP-H04	4.58	3.11	-1.47
25 yr 72 hr	N-DP-H05	4.58	3.16	-1.42
25 yr 72 hr	N-DP-H05x	4.58	3.8	-0.78
25 yr 72 hr	N-DP-H06	4.57	2.57	-2
25 yr 72 hr	N-DP-H06x	4.58	4.06	-0.52
25 yr 72 hr	N-DP-K07	4.58	2.64	-1.94
25 yr 72 hr	N-DP-M10	5.26	5.08	-0.18
25 yr 72 hr	N-DP-M11	5.31	5.07	-0.24
25 yr 72 hr	N-DP-M12	5.38	5.27	-0.11
25 yr 72 hr	N-DP-N10	5.12	4.86	-0.26
25 yr 72 hr	N-DP-O10	4.88	3.62	-1.26
25 yr 72 hr	N-DP-O11	4.89	3.74	-1.15
25 yr 72 hr	N-DP-P06	4.64	4.55	-0.09
25 yr 72 hr	N-DP-Y03	5.12	5.12	0
25 yr 72 hr	N-DP-Z12	4.4	4.21	-0.19
25 yr 72 hr	N-DQ-A01	4.55	2.5	-2.05
25 yr 72 hr	N-DQ-A02	4.56	3.16	-1.4
25 yr 72 hr	N-DQ-A03	4.55	2.43	-2.12
25 yr 72 hr	N-DQ-A03x	3.13	1.99	-1.14
25 yr 72 hr	N-DQ-A04	5.57	5.57	0
25 yr 72 hr	N-DQ-A05	4.36	2.22	-2.14
25 yr 72 hr	N-DQ-A06	4.55	3.38	-1.17
25 yr 72 hr	N-DQ-A07	4.55	3.43	-1.12
25 yr 72 hr	N-DQ-A08	4.55	3.47	-1.08
25 yr 72 hr	N-E01	2.93	2.93	0
25 yr 72 hr	N-E02	3.39	3.39	0
25 yr 72 hr	N-E03	4.02	4.02	0
25 yr 72 hr	N-E07	4.54	4.54	0
25 yr 72 hr	N-E08	3.82	3.82	0
25 yr 72 hr	N-E10	3.74	3.74	0
25 yr 72 hr	N-E11	2.57	2.57	0
25 yr 72 hr	N-EA	1.59	1.59	0
25 yr 72 hr	N-EA-A01	3.86	3.86	0
25 yr 72 hr	N-EA-A02	3.86	3.86	0
25 yr 72 hr	N-EB	1.59	1.59	0
25 yr 72 hr	N-EB-A01	3.03	3.03	0
25 yr 72 hr	N-EC	1.59	1.59	0
25 yr 72 hr	N-EC-A01	3.11	3.11	0
25 yr 72 hr	N-ED	1.59	1.59	0
25 yr 72 hr	N-ED-A01	3.63	3.63	0
25 yr 72 hr	N-ED-A02	3.64	3.64	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-ED-A03	3.64	3.64	0
25 yr 72 hr	N-EE	1.59	1.59	0
25 yr 72 hr	N-EE-A01	3.71	3.71	0
25 yr 72 hr	N-EF	1.59	1.59	0
25 yr 72 hr	N-EF-A01	3.71	3.71	0
25 yr 72 hr	N-EG	1.59	1.59	0
25 yr 72 hr	N-EG-A01	3.46	3.46	0
25 yr 72 hr	N-EG-A02	3.66	3.66	0
25 yr 72 hr	N-EH	1.59	1.59	0
25 yr 72 hr	N-EH-A01	2.02	2.02	0
25 yr 72 hr	N-EI	1.59	1.59	0
25 yr 72 hr	N-EJ	1.59	1.59	0
25 yr 72 hr	N-EJ-A01	1.65	1.65	0
25 yr 72 hr	N-EK	1.59	1.59	0
25 yr 72 hr	N-EK-A01	3.76	3.76	0
25 yr 72 hr	N-EL	1.59	1.59	0
25 yr 72 hr	N-EL-A01	3.04	3.04	0
25 yr 72 hr	N-EM	1.59	1.59	0
25 yr 72 hr	N-EM-A01	2.83	2.83	0
25 yr 72 hr	N-EM-A02	2.74	2.74	0
25 yr 72 hr	N-EM-A03	2.57	2.57	0
25 yr 72 hr	N-EN	1.59	1.59	0
25 yr 72 hr	N-EN-A01	2.92	2.92	0
25 yr 72 hr	N-EO	1.59	1.59	0
25 yr 72 hr	N-EO-A01	2.46	2.46	0
25 yr 72 hr	N-EP	1.59	1.59	0
25 yr 72 hr	N-EP-A01	2.56	2.56	0
25 yr 72 hr	N-EQ	1.59	1.59	0
25 yr 72 hr	N-EQ-A01	1.67	1.67	0
25 yr 72 hr	N-ER	1.59	1.59	0
25 yr 72 hr	N-ES	1.59	1.59	0
25 yr 72 hr	N-ET	1.59	1.59	0
25 yr 72 hr	N-ET-A01	1.6	1.6	0
25 yr 72 hr	NZA-0110	#N/A	1.64	#N/A
25 yr 72 hr	NZA-0120	#N/A	1.63	#N/A
25 yr 72 hr	NZA-0130	#N/A	1.62	#N/A
25 yr 72 hr	NZA-0150	#N/A	1.64	#N/A
25 yr 72 hr	NZA-0160	#N/A	1.63	#N/A
25 yr 72 hr	Trunkline-Junction-1	#N/A	2.98	#N/A

Baseline Future Conditions

Kimley»Horn

Area A Baseline Future Conditions (A)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Baseline Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ABA	1.59	4.4	2.81
10 YR 1 HR	N-ABA-A01	3.66	5.29	1.63
10 YR 1 HR	N-ABA-A02	3.83	5.29	1.46
10 YR 1 HR	N-ABB	1.59	4.4	2.81
10 YR 1 HR	N-ABB-A01	3.57	5.07	1.5
10 YR 1 HR	N-ABB-A02	4.23	5.3	1.07
10 YR 1 HR	N-ABB-A03	4.23	5.3	1.07
10 YR 1 HR	N-ABB-A04	4.23	5.31	1.08
10 YR 1 HR	N-ABB-B02	4.25	5.3	1.05
10 YR 1 HR	N-ABB-B03	4.27	5.3	1.03
10 YR 1 HR	N-ABB-B03x	4.28	5.3	1.02
10 YR 1 HR	N-ABB-B04	4.28	5.29	1.01
10 YR 1 HR	N-ABC	1.59	4.4	2.81
10 YR 1 HR	N-ABC-A01	4.21	5.31	1.1
10 YR 1 HR	N-ABC-A02	4.22	5.31	1.09
10 YR 1 HR	N-ABC-B02	4.21	5.31	1.1
10 YR 1 HR	N-ABD	1.59	4.4	2.81
10 YR 1 HR	N-ABD-A01	3.33	5.32	1.99
10 YR 1 HR	N-ABD-A02	4.06	5.32	1.26
10 YR 1 HR	N-ABD-A02x	3.76	5.32	1.56
10 YR 1 HR	N-ABD-A03	4.64	5.41	0.77
10 YR 1 HR	N-ABD-A03x	4.11	5.32	1.21
10 YR 1 HR	N-ABD-A04	4.95	5.5	0.55
10 YR 1 HR	N-ABD-A05	5.18	5.52	0.34
10 YR 1 HR	N-ABD-A06	5.19	5.34	0.15
10 YR 1 HR	N-ABD-A07	5.19	5.34	0.15
10 YR 1 HR	N-ABD-B04	5.43	5.64	0.21
10 YR 1 HR	N-ABD-B05	5.52	5.65	0.13
10 YR 1 HR	N-ABD-B05x	5.43	5.63	0.2
10 YR 1 HR	N-ABD-B06	5.53	5.65	0.12
10 YR 1 HR	N-ABD-B07	6.17	6.32	0.15
10 YR 1 HR	N-ABD-B08	7.41	7.41	0
10 YR 1 HR	N-ABE	1.59	4.4	2.81
10 YR 1 HR	N-ABE-A01	2.05	5.31	3.26
10 YR 1 HR	N-ABE-A02	2.68	5.31	2.63
10 YR 1 HR	N-ABF	1.59	4.4	2.81
10 YR 1 HR	N-ABF-A01	4.11	5.31	1.2
10 YR 1 HR	N-ABF-A02	4.11	5.31	1.2
10 YR 1 HR	N-ABG	1.59	4.4	2.81
10 YR 1 HR	N-ABG-A01	4.53	5.34	0.81
10 YR 1 HR	N-ABG-A02	4.76	5.34	0.58
10 YR 1 HR	N-ABG-A03	4.79	5.34	0.55
10 YR 1 HR	N-ABH	1.59	4.4	2.81
10 YR 1 HR	N-ABH-A01	4.07	5.16	1.09

Sim	Node Name	Existing Maximum Stage [ft]	Baseline Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ABH-A02	4.98	5.38	0.4
10 YR 1 HR	N-ABH-A03	4.98	5.38	0.4
10 YR 1 HR	N-ABH-A03x	4.98	5.39	0.41
10 YR 1 HR	N-ABH-B02	5.02	5.41	0.39
10 YR 1 HR	N-ABH-B03	5.03	5.41	0.38
10 YR 1 HR	N-ABH-B03x	5.03	5.42	0.39
10 YR 1 HR	N-ABH-B04	5.04	5.42	0.38
10 YR 1 HR	N-ABI	1.59	4.4	2.81
10 YR 1 HR	N-ABI-A01	4.93	5.37	0.44
10 YR 1 HR	N-ABI-A02	4.93	5.37	0.44
10 YR 1 HR	N-ABJ	1.59	4.4	2.81
10 YR 1 HR	N-ABJ-A01	4.95	5.38	0.43
10 YR 1 HR	N-ABJ-A02	4.95	5.38	0.43
10 YR 1 HR	N-ABK	1.59	4.4	2.81
10 YR 1 HR	N-ABK-A01	3.71	5.4	1.69
10 YR 1 HR	N-ABK-A02x1	5.66	6.59	0.93
10 YR 1 HR	N-ABK-A02x2	5.67	6.59	0.92
10 YR 1 HR	N-ABK-B02	4.99	5.35	0.36
10 YR 1 HR	N-ABK-B03	4.99	5.35	0.36
10 YR 1 HR	N-ABK-B04	7.48	7.48	0
10 YR 1 HR	N-ABL	1.59	4.4	2.81
10 YR 1 HR	N-ABL-A01	3.41	5.17	1.76
10 YR 1 HR	N-ABL-A02	4.33	5.17	0.84
10 YR 1 HR	N-ABM	1.59	4.4	2.81
10 YR 1 HR	N-ABM-A01	4.74	5.17	0.43
10 YR 1 HR	N-ABM-A02	4.74	5.17	0.43
10 YR 1 HR	N-ABN	1.59	4.4	2.81
10 YR 1 HR	N-ABN-A01	9.68	9.68	0
10 YR 1 HR	N-ABO	1.59	4.4	2.81
10 YR 1 HR	N-ABO-A01	3.81	5.56	1.75
10 YR 1 HR	N-ABO-A02	5.2	6.03	0.83
10 YR 1 HR	N-ABP	1.59	4.4	2.81
10 YR 1 HR	N-ABQ	1.59	4.4	2.81
10 YR 1 HR	N-ADA-A01	6.1	6.65	0.55
10 YR 1 HR	N-ADA-A02	6.92	7.05	0.13
10 YR 1 HR	N-ADA-A03	6.93	7.06	0.13
10 YR 1 HR	N-ADA-A03x	6.92	7.05	0.13
10 YR 1 HR	N-ADA-A04	6.94	7.07	0.13
10 YR 1 HR	N-ADA-A05	6.94	7.07	0.13
10 YR 1 HR	N-ADA-B02	6.57	6.74	0.17
10 YR 1 HR	N-ADA-B03	6.57	6.73	0.16
10 YR 1 HR	N-ADA-B03x	6.57	6.73	0.16
10 YR 1 HR	N-ADA-B04	7.22	7.22	0
10 YR 1 HR	N-ADB-08	7.07	7.09	0.02

Sim	Node Name	Existing Maximum Stage [ft]	Baseline Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADB-A01	7.3	7.45	0.15
10 YR 1 HR	N-ADB-A02	7.48	7.5	0.02
10 YR 1 HR	N-ADB-A03	8.47	8.47	0
10 YR 1 HR	N-ADB-A04	8.84	8.84	0
10 YR 1 HR	N-ADB-A04x	8.76	8.76	0
10 YR 1 HR	N-ADB-B03	7.49	7.51	0.02
10 YR 1 HR	N-ADB-B04	8.83	8.83	0
10 YR 1 HR	N-ADB-B05	8.86	8.86	0
10 YR 1 HR	N-ADB-B06	9.16	9.16	0
10 YR 1 HR	N-ADB-B07	9.7	9.7	0
10 YR 1 HR	N-ADB-B07x	9.66	9.66	0
10 YR 1 HR	N-ADC-A01	7.96	8.07	0.11
10 YR 1 HR	N-ADC-A02	7.97	8.07	0.1
10 YR 1 HR	N-ADD-A01	7.8	7.63	-0.17
10 YR 1 HR	N-ADD-A02	7.93	7.77	-0.16
10 YR 1 HR	N-ADD-A03	10.93	10.93	0
10 YR 1 HR	N-ADD-A04	10.93	10.93	0
10 YR 1 HR	N-ADD-A04x	10.93	10.93	0
10 YR 1 HR	N-ADD-A05	10.98	10.98	0
10 YR 1 HR	N-ADD-A06	10.99	10.99	0
10 YR 1 HR	N-ADD-A07	12.51	12.51	0
10 YR 1 HR	N-ADD-A08	12.53	12.53	0
10 YR 1 HR	N-ADD-A09	12.59	12.59	0
10 YR 1 HR	N-ADD-A10	12.59	12.59	0
10 YR 1 HR	N-ADD-A11	12.64	12.64	0
10 YR 1 HR	N-ADD-A12	13.08	13.08	0
10 YR 1 HR	N-ADD-A13	13.36	13.36	0
10 YR 1 HR	N-ADD-A14	13.37	13.37	0
10 YR 1 HR	N-ADD-A15	13.35	13.35	0
10 YR 1 HR	N-ADD-A16	13.25	13.25	0
10 YR 1 HR	N-ADD-B03	7.95	7.8	-0.15
10 YR 1 HR	N-ADD-B05	11.67	11.68	0.01
10 YR 1 HR	N-ADD-C04	10.94	10.94	0
10 YR 1 HR	N-ADD-C05	11.24	11.24	0
10 YR 1 HR	N-ADD-D08	12.01	12.01	0
10 YR 1 HR	N-ADD-D09	11.87	11.87	0
10 YR 1 HR	N-ADD-H04	10.93	10.93	0
10 YR 1 HR	N-ADD-N13	12.88	12.88	0
10 YR 1 HR	N-ADD-N14	13.15	13.15	0
10 YR 1 HR	N-ADD-N15	12.55	12.55	0
10 YR 1 HR	N-ADE-A01	6.96	7.5	0.54
10 YR 1 HR	N-ADE-A02	8.4	8.48	0.08
10 YR 1 HR	N-ADE-A03	8.68	8.69	0.01
10 YR 1 HR	N-ADE-A04	9.1	9.11	0.01

Sim	Node Name	Existing Maximum Stage [ft]	Baseline Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADE-A04x	8.7	8.71	0.01
10 YR 1 HR	N-ADE-A05	10.84	10.84	0
10 YR 1 HR	N-ADE-A05x	9.1	9.1	0
10 YR 1 HR	N-ADE-A06	11.2	11.2	0
10 YR 1 HR	N-ADE-B02	7.01	7.17	0.16
10 YR 1 HR	N-ADE-B03	7.02	7.15	0.13
10 YR 1 HR	N-ADE-C02	7.52	7.59	0.07
10 YR 1 HR	N-ADE-C03	7.54	7.59	0.05
10 YR 1 HR	N-ADE-D03	7	7.12	0.12
10 YR 1 HR	N-ADS-A01	5.67	6.34	0.67
10 YR 1 HR	N-ADS-A02	5.99	6.34	0.35
10 YR 1 HR	N-ASA-A01	5.41	5.79	0.38
10 YR 1 HR	N-ASA-A02	5.41	5.79	0.38
10 YR 1 HR	N-ASA-A03	5.61	5.9	0.29
10 YR 1 HR	N-ASA-A04	5.72	5.96	0.24
10 YR 1 HR	N-ASA-A05	5.89	6.06	0.17
10 YR 1 HR	N-ASA-A06	6.09	6.13	0.04
10 YR 1 HR	N-ASA-A07	6.12	6.15	0.03
10 YR 1 HR	N-ASB-A01	5.55	5.8	0.25
10 YR 1 HR	N-ASB-A02	5.55	5.8	0.25
10 YR 1 HR	N-ASB-B02	5.8	5.82	0.02
10 YR 1 HR	N-ASC-A01	5.32	6.21	0.89
10 YR 1 HR	N-ASC-A02	5.99	6.85	0.86
10 YR 1 HR	N-ASC-A03	6.24	7.04	0.8
10 YR 1 HR	N-ASC-A04	6.5	7.05	0.55
10 YR 1 HR	N-ASC-B02	5.61	6.38	0.77
10 YR 1 HR	N-ASC-B03	5.65	6.41	0.76
10 YR 1 HR	N-ASD-A01a	5.82	6.59	0.77
10 YR 1 HR	N-ASD-A02	8.07	8.61	0.54
10 YR 1 HR	N-ASD-A03	8.89	9.33	0.44
10 YR 1 HR	N-ASD-A04	9.95	10.26	0.31
10 YR 1 HR	N-ASD-A05	10.3	10.57	0.27
10 YR 1 HR	N-ASD-A06	10.99	11.23	0.24
10 YR 1 HR	N-ASD-A07	11.55	11.73	0.18
10 YR 1 HR	N-ASD-A08	12.21	12.31	0.1
10 YR 1 HR	N-ASD-A09	13.04	13.08	0.04
10 YR 1 HR	N-ASD-A11	14.02	14.02	0
10 YR 1 HR	N-ASD-A12	14.91	14.92	0.01
10 YR 1 HR	N-ASD-A13	15.49	15.5	0.01
10 YR 1 HR	N-ASD-A14	15.82	15.82	0
10 YR 1 HR	N-ASD-A15	16.4	16.4	0
10 YR 1 HR	N-ASD-A16	14.3	14.3	0
10 YR 1 HR	N-ASD-A17	16.61	16.61	0
10 YR 1 HR	N-ASD-A18	15.58	15.58	0

Sim	Node Name	Existing Maximum Stage [ft]	Baseline Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASD-A19	14.92	14.92	0
10 YR 1 HR	N-ASD-B02	5.9	6.64	0.74
10 YR 1 HR	N-ASD-B03	7.08	7.63	0.55
10 YR 1 HR	N-ASD-B04	7.52	7.93	0.41
10 YR 1 HR	N-ASD-B05	8.63	8.67	0.04
10 YR 1 HR	N-ASD-C03	6.06	6.65	0.59
10 YR 1 HR	N-ASD-C04	6.08	6.39	0.31
10 YR 1 HR	N-ASD-D04	7.85	8.2	0.35
10 YR 1 HR	N-ASD-D05	8.43	8.49	0.06
10 YR 1 HR	N-ASD-D06	8.14	8.18	0.04
10 YR 1 HR	N-ASD-D07	8.49	8.53	0.04
10 YR 1 HR	N-ASD-E04	9.39	9.77	0.38
10 YR 1 HR	N-ASD-E05	10.23	10.51	0.28
10 YR 1 HR	N-ASD-E06	10.4	10.65	0.25
10 YR 1 HR	N-ASD-E09	14.14	14.14	0
10 YR 1 HR	N-ASD-E10	13.84	13.85	0.01
10 YR 1 HR	N-ASD-F03	8.62	9.07	0.45
10 YR 1 HR	N-ASD-F04	9.24	9.27	0.03
10 YR 1 HR	N-ASD-F05	9.67	9.68	0.01
10 YR 1 HR	N-ASD-G04	8.9	9.34	0.44
10 YR 1 HR	N-ASD-H07	9.29	9.29	0
10 YR 1 HR	N-ASD-H08	9.42	9.42	0
10 YR 1 HR	N-ASD-I09	10.85	10.86	0.01
10 YR 1 HR	N-ASD-J10	12.51	12.51	0
10 YR 1 HR	N-ASD-K10	13.86	13.86	0
10 YR 1 HR	N-ASD-L07	10.46	10.47	0.01
10 YR 1 HR	N-ASD-Q06	10.32	10.57	0.25
10 YR 1 HR	N-ASD-Q08	11.23	11.44	0.21
10 YR 1 HR	N-ASD-Q09	12.64	12.68	0.04
10 YR 1 HR	N-ASD-R13	14.22	14.22	0
10 YR 1 HR	N-ASD-S13	14.84	14.84	0
10 YR 1 HR	N-ASD-T15	16.56	16.56	0
10 YR 1 HR	N-ASD-U06	10.26	10.53	0.27
10 YR 1 HR	N-ASE-A01	5.62	6.44	0.82
10 YR 1 HR	N-ASE-A02	5.82	6.64	0.82
10 YR 1 HR	N-ASE-A03	7.99	8.3	0.31
10 YR 1 HR	N-ASE-A04	7.99	8.3	0.31
10 YR 1 HR	N-ASE-A05	11.37	11.37	0
10 YR 1 HR	N-ASE-B02	5.67	6.53	0.86
10 YR 1 HR	N-ASE-C03	6.14	7.03	0.89
10 YR 1 HR	N-ASE-D03	6.79	7.72	0.93
10 YR 1 HR	N-ASF-A01	6.28	6.49	0.21
10 YR 1 HR	N-ASF-A02	6.28	6.49	0.21
10 YR 1 HR	N-ASG-A01	5.69	6.14	0.45

Sim	Node Name	Existing Maximum Stage [ft]	Baseline Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASG-A02	6.03	6.37	0.34
10 YR 1 HR	N-ASG-A03	6.51	6.73	0.22
10 YR 1 HR	N-ASG-A04	7.03	7.19	0.16
10 YR 1 HR	N-ASG-A05	7.03	7.2	0.17
10 YR 1 HR	N-ASG-A06	7.11	7.11	0
10 YR 1 HR	N-ASG-B02	5.72	6.12	0.4
10 YR 1 HR	N-ASG-B03x	5.72	6.12	0.4
10 YR 1 HR	N-ASG-C04	6.42	6.47	0.05
10 YR 1 HR	N-ASG-C05	6.4	6.42	0.02
10 YR 1 HR	N-ASH-A01	5.56	6.13	0.57
10 YR 1 HR	N-ASH-A02	5.65	6.13	0.48
10 YR 1 HR	N-ASI-A01	5.43	5.51	0.08
10 YR 1 HR	N-ASJ	1.59	4.4	2.81
10 YR 1 HR	N-ASJ-A01	5.69	6.04	0.35
10 YR 1 HR	N-ASK-A01	5.42	6.03	0.61

Sim	Node Name	Existing Maximum Stage [ft]	Baseline Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ABA	1.59	4.4	2.81
25 YR 72 HR	N-ABA-A01	4.85	5.83	0.98
25 YR 72 HR	N-ABA-A02	4.85	5.83	0.98
25 YR 72 HR	N-ABB	1.59	4.4	2.81
25 YR 72 HR	N-ABB-A01	4.04	5.48	1.44
25 YR 72 HR	N-ABB-A02	4.87	5.85	0.98
25 YR 72 HR	N-ABB-A03	4.88	5.86	0.98
25 YR 72 HR	N-ABB-A04	4.88	5.86	0.98
25 YR 72 HR	N-ABB-B02	4.87	5.84	0.97
25 YR 72 HR	N-ABB-B03	4.87	5.83	0.96
25 YR 72 HR	N-ABB-B03x	4.87	5.83	0.96
25 YR 72 HR	N-ABB-B04	4.87	5.83	0.96
25 YR 72 HR	N-ABC	1.59	4.4	2.81
25 YR 72 HR	N-ABC-A01	4.89	5.88	0.99
25 YR 72 HR	N-ABC-A02	4.89	5.88	0.99
25 YR 72 HR	N-ABC-B02	4.89	5.88	0.99
25 YR 72 HR	N-ABD	1.59	4.4	2.81
25 YR 72 HR	N-ABD-A01	4.91	5.89	0.98
25 YR 72 HR	N-ABD-A02	4.92	5.9	0.98
25 YR 72 HR	N-ABD-A02x	4.92	5.9	0.98
25 YR 72 HR	N-ABD-A03	5.22	5.92	0.7
25 YR 72 HR	N-ABD-A03x	4.93	5.9	0.97
25 YR 72 HR	N-ABD-A04	5.6	5.94	0.34
25 YR 72 HR	N-ABD-A05	5.66	6	0.34
25 YR 72 HR	N-ABD-A06	5.28	5.92	0.64
25 YR 72 HR	N-ABD-A07	5.28	5.92	0.64
25 YR 72 HR	N-ABD-B04	5.73	5.94	0.21
25 YR 72 HR	N-ABD-B05	5.74	5.94	0.2
25 YR 72 HR	N-ABD-B05x	5.72	5.94	0.22
25 YR 72 HR	N-ABD-B06	5.74	5.95	0.21
25 YR 72 HR	N-ABD-B07	6.82	6.96	0.14
25 YR 72 HR	N-ABD-B08	7.49	7.49	0
25 YR 72 HR	N-ABE	1.59	4.4	2.81
25 YR 72 HR	N-ABE-A01	4.89	5.86	0.97
25 YR 72 HR	N-ABE-A02	4.89	5.86	0.97
25 YR 72 HR	N-ABF	1.59	4.4	2.81
25 YR 72 HR	N-ABF-A01	4.88	5.83	0.95
25 YR 72 HR	N-ABF-A02	4.89	5.83	0.94
25 YR 72 HR	N-ABG	1.59	4.4	2.81
25 YR 72 HR	N-ABG-A01	5.04	5.92	0.88
25 YR 72 HR	N-ABG-A02	5.04	5.92	0.88
25 YR 72 HR	N-ABG-A03	5.05	5.92	0.87
25 YR 72 HR	N-ABH	1.59	4.4	2.81
25 YR 72 HR	N-ABH-A01	4.6	5.59	0.99

Sim	Node Name	Existing Maximum Stage [ft]	Baseline Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ABH-A02	5.53	5.92	0.39
25 YR 72 HR	N-ABH-A03	5.53	5.92	0.39
25 YR 72 HR	N-ABH-A03x	5.53	5.92	0.39
25 YR 72 HR	N-ABH-B02	5.57	5.99	0.42
25 YR 72 HR	N-ABH-B03	5.58	5.99	0.41
25 YR 72 HR	N-ABH-B03x	5.59	5.99	0.4
25 YR 72 HR	N-ABH-B04	5.59	6	0.41
25 YR 72 HR	N-ABI	1.59	4.4	2.81
25 YR 72 HR	N-ABI-A01	5.52	5.91	0.39
25 YR 72 HR	N-ABI-A02	5.52	5.91	0.39
25 YR 72 HR	N-ABJ	1.59	4.4	2.81
25 YR 72 HR	N-ABJ-A01	5.52	5.91	0.39
25 YR 72 HR	N-ABJ-A02	5.52	5.92	0.4
25 YR 72 HR	N-ABK	1.59	4.4	2.81
25 YR 72 HR	N-ABK-A01	4.39	5.83	1.44
25 YR 72 HR	N-ABK-A02x1	6.85	7.4	0.55
25 YR 72 HR	N-ABK-A02x2	6.86	7.42	0.56
25 YR 72 HR	N-ABK-B02	5.47	5.82	0.35
25 YR 72 HR	N-ABK-B03	5.47	5.82	0.35
25 YR 72 HR	N-ABK-B04	7.51	7.51	0
25 YR 72 HR	N-ABL	1.59	4.4	2.81
25 YR 72 HR	N-ABL-A01	5.23	5.41	0.18
25 YR 72 HR	N-ABL-A02	5.22	5.41	0.19
25 YR 72 HR	N-ABM	1.59	4.4	2.81
25 YR 72 HR	N-ABM-A01	5.22	5.41	0.19
25 YR 72 HR	N-ABM-A02	5.22	5.41	0.19
25 YR 72 HR	N-ABN	1.59	4.4	2.81
25 YR 72 HR	N-ABN-A01	9.84	9.84	0
25 YR 72 HR	N-ABO	1.59	4.4	2.81
25 YR 72 HR	N-ABO-A01	4.42	5.91	1.49
25 YR 72 HR	N-ABO-A02	5.48	6.34	0.86
25 YR 72 HR	N-ABP	1.59	4.4	2.81
25 YR 72 HR	N-ABQ	1.59	4.4	2.81
25 YR 72 HR	N-ADA-A01	6.84	7.33	0.49
25 YR 72 HR	N-ADA-A02	7.42	7.52	0.1
25 YR 72 HR	N-ADA-A03	7.42	7.53	0.11
25 YR 72 HR	N-ADA-A03x	7.41	7.52	0.11
25 YR 72 HR	N-ADA-A04	7.44	7.54	0.1
25 YR 72 HR	N-ADA-A05	7.44	7.54	0.1
25 YR 72 HR	N-ADA-B02	7.08	7.2	0.12
25 YR 72 HR	N-ADA-B03	7.07	7.2	0.13
25 YR 72 HR	N-ADA-B03x	7.07	7.2	0.13
25 YR 72 HR	N-ADA-B04	7.24	7.24	0
25 YR 72 HR	N-ADB-08	7.46	7.56	0.1

Sim	Node Name	Existing Maximum Stage [ft]	Baseline Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ADB-A01	7.6	7.66	0.06
25 YR 72 HR	N-ADB-A02	7.61	7.67	0.06
25 YR 72 HR	N-ADB-A03	8.59	8.59	0
25 YR 72 HR	N-ADB-A04	8.88	8.88	0
25 YR 72 HR	N-ADB-A04x	8.83	8.83	0
25 YR 72 HR	N-ADB-B03	7.62	7.67	0.05
25 YR 72 HR	N-ADB-B04	8.94	8.94	0
25 YR 72 HR	N-ADB-B05	8.97	8.97	0
25 YR 72 HR	N-ADB-B06	9.25	9.25	0
25 YR 72 HR	N-ADB-B07	9.87	9.87	0
25 YR 72 HR	N-ADB-B07x	9.8	9.8	0
25 YR 72 HR	N-ADC-A01	8.23	8.27	0.04
25 YR 72 HR	N-ADC-A02	8.23	8.27	0.04
25 YR 72 HR	N-ADD-A01	8.55	8.9	0.35
25 YR 72 HR	N-ADD-A02	8.75	9.06	0.31
25 YR 72 HR	N-ADD-A03	10.99	10.99	0
25 YR 72 HR	N-ADD-A04	10.99	10.99	0
25 YR 72 HR	N-ADD-A04x	10.99	10.99	0
25 YR 72 HR	N-ADD-A05	11.03	11.03	0
25 YR 72 HR	N-ADD-A06	11.04	11.04	0
25 YR 72 HR	N-ADD-A07	12.55	12.55	0
25 YR 72 HR	N-ADD-A08	12.57	12.57	0
25 YR 72 HR	N-ADD-A09	12.63	12.63	0
25 YR 72 HR	N-ADD-A10	12.63	12.63	0
25 YR 72 HR	N-ADD-A11	12.67	12.67	0
25 YR 72 HR	N-ADD-A12	13.12	13.12	0
25 YR 72 HR	N-ADD-A13	13.39	13.39	0
25 YR 72 HR	N-ADD-A14	13.38	13.38	0
25 YR 72 HR	N-ADD-A15	13.36	13.36	0
25 YR 72 HR	N-ADD-A16	13.26	13.26	0
25 YR 72 HR	N-ADD-B03	8.8	9.09	0.29
25 YR 72 HR	N-ADD-B05	11.74	11.74	0
25 YR 72 HR	N-ADD-C04	11	11	0
25 YR 72 HR	N-ADD-C05	11.27	11.27	0
25 YR 72 HR	N-ADD-D08	12.02	12.02	0
25 YR 72 HR	N-ADD-D09	11.9	11.9	0
25 YR 72 HR	N-ADD-H04	10.99	10.99	0
25 YR 72 HR	N-ADD-N13	12.9	12.9	0
25 YR 72 HR	N-ADD-N14	13.17	13.17	0
25 YR 72 HR	N-ADD-N15	12.56	12.56	0
25 YR 72 HR	N-ADE-A01	7.76	8	0.24
25 YR 72 HR	N-ADE-A02	8.62	8.66	0.04
25 YR 72 HR	N-ADE-A03	8.76	8.77	0.01
25 YR 72 HR	N-ADE-A04	9.15	9.16	0.01

Area A Baseline Future Conditions (A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Baseline Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ADE-A04x	8.78	8.79	0.01
25 YR 72 HR	N-ADE-A05	10.89	10.89	0
25 YR 72 HR	N-ADE-A05x	9.15	9.15	0
25 YR 72 HR	N-ADE-A06	11.25	11.25	0
25 YR 72 HR	N-ADE-B02	7.3	7.49	0.19
25 YR 72 HR	N-ADE-B03	7.3	7.48	0.18
25 YR 72 HR	N-ADE-C02	7.77	8	0.23
25 YR 72 HR	N-ADE-C03	7.78	8.01	0.23
25 YR 72 HR	N-ADE-D03	7.28	7.47	0.19
25 YR 72 HR	N-ADS-A01	6.41	6.55	0.14
25 YR 72 HR	N-ADS-A02	6.41	6.54	0.13
25 YR 72 HR	N-ASA-A01	5.51	5.94	0.43
25 YR 72 HR	N-ASA-A02	5.51	5.94	0.43
25 YR 72 HR	N-ASA-A03	5.78	6.06	0.28
25 YR 72 HR	N-ASA-A04	5.92	6.11	0.19
25 YR 72 HR	N-ASA-A05	6.09	6.23	0.14
25 YR 72 HR	N-ASA-A06	6.17	6.27	0.1
25 YR 72 HR	N-ASA-A07	6.19	6.28	0.09
25 YR 72 HR	N-ASB-A01	5.59	5.95	0.36
25 YR 72 HR	N-ASB-A02	5.59	5.96	0.37
25 YR 72 HR	N-ASB-B02	5.83	5.96	0.13
25 YR 72 HR	N-ASC-A01	5.68	6.56	0.88
25 YR 72 HR	N-ASC-A02	6.83	7.48	0.65
25 YR 72 HR	N-ASC-A03	7.11	7.48	0.37
25 YR 72 HR	N-ASC-A04	7.12	7.48	0.36
25 YR 72 HR	N-ASC-B02	6.17	6.54	0.37
25 YR 72 HR	N-ASC-B03	6.26	6.54	0.28
25 YR 72 HR	N-ASD-A01a	6.3	7.12	0.82
25 YR 72 HR	N-ASD-A02	8.51	8.99	0.48
25 YR 72 HR	N-ASD-A03	9.34	9.69	0.35
25 YR 72 HR	N-ASD-A04	10.42	10.59	0.17
25 YR 72 HR	N-ASD-A05	10.77	10.91	0.14
25 YR 72 HR	N-ASD-A06	11.44	11.55	0.11
25 YR 72 HR	N-ASD-A07	11.89	11.98	0.09
25 YR 72 HR	N-ASD-A08	12.44	12.5	0.06
25 YR 72 HR	N-ASD-A09	13.17	13.2	0.03
25 YR 72 HR	N-ASD-A11	14.09	14.1	0.01
25 YR 72 HR	N-ASD-A12	15.03	15.04	0.01
25 YR 72 HR	N-ASD-A13	15.62	15.62	0
25 YR 72 HR	N-ASD-A14	15.92	15.92	0
25 YR 72 HR	N-ASD-A15	16.41	16.41	0
25 YR 72 HR	N-ASD-A16	14.31	14.31	0
25 YR 72 HR	N-ASD-A17	16.62	16.62	0
25 YR 72 HR	N-ASD-A18	15.58	15.58	0

Sim	Node Name	Existing Maximum Stage [ft]	Baseline Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASD-A19	14.93	14.93	0
25 YR 72 HR	N-ASD-B02	6.43	7.27	0.84
25 YR 72 HR	N-ASD-B03	7.84	8.41	0.57
25 YR 72 HR	N-ASD-B04	8.09	8.54	0.45
25 YR 72 HR	N-ASD-B05	8.8	8.93	0.13
25 YR 72 HR	N-ASD-C03	8.95	9.07	0.12
25 YR 72 HR	N-ASD-C04	7.11	7.47	0.36
25 YR 72 HR	N-ASD-D04	8.96	9.07	0.11
25 YR 72 HR	N-ASD-D05	9	9.08	0.08
25 YR 72 HR	N-ASD-D06	8.77	8.82	0.05
25 YR 72 HR	N-ASD-D07	9.07	9.13	0.06
25 YR 72 HR	N-ASD-E04	9.84	10.12	0.28
25 YR 72 HR	N-ASD-E05	10.78	10.93	0.15
25 YR 72 HR	N-ASD-E06	10.98	11.12	0.14
25 YR 72 HR	N-ASD-E09	14.21	14.22	0.01
25 YR 72 HR	N-ASD-E10	13.9	13.91	0.01
25 YR 72 HR	N-ASD-F03	9	9.28	0.28
25 YR 72 HR	N-ASD-F04	9.28	9.32	0.04
25 YR 72 HR	N-ASD-F05	9.69	9.7	0.01
25 YR 72 HR	N-ASD-G04	9.35	9.69	0.34
25 YR 72 HR	N-ASD-H07	9.55	9.55	0
25 YR 72 HR	N-ASD-H08	9.55	9.55	0
25 YR 72 HR	N-ASD-I09	10.9	10.9	0
25 YR 72 HR	N-ASD-J10	12.54	12.54	0
25 YR 72 HR	N-ASD-K10	13.9	13.91	0.01
25 YR 72 HR	N-ASD-L07	11.3	11.31	0.01
25 YR 72 HR	N-ASD-Q06	10.93	11.07	0.14
25 YR 72 HR	N-ASD-Q08	11.7	11.79	0.09
25 YR 72 HR	N-ASD-Q09	12.78	12.81	0.03
25 YR 72 HR	N-ASD-R13	14.25	14.25	0
25 YR 72 HR	N-ASD-S13	14.85	14.85	0
25 YR 72 HR	N-ASD-T15	16.56	16.56	0
25 YR 72 HR	N-ASD-U06	10.79	10.94	0.15
25 YR 72 HR	N-ASE-A01	6.11	6.9	0.79
25 YR 72 HR	N-ASE-A02	6.38	7.2	0.82
25 YR 72 HR	N-ASE-A03	9.1	9.21	0.11
25 YR 72 HR	N-ASE-A04	9.11	9.21	0.1
25 YR 72 HR	N-ASE-A05	11.45	11.45	0
25 YR 72 HR	N-ASE-B02	6.14	6.83	0.69
25 YR 72 HR	N-ASE-C03	7.04	8.11	1.07
25 YR 72 HR	N-ASE-D03	7.87	8.12	0.25
25 YR 72 HR	N-ASF-A01	6.47	6.72	0.25
25 YR 72 HR	N-ASF-A02	6.47	6.72	0.25
25 YR 72 HR	N-ASG-A01	5.93	6.37	0.44

Sim	Node Name	Existing Maximum Stage [ft]	Baseline Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASG-A02	6.27	6.78	0.51
25 YR 72 HR	N-ASG-A03	6.8	7.08	0.28
25 YR 72 HR	N-ASG-A04	7.46	7.53	0.07
25 YR 72 HR	N-ASG-A05	7.46	7.53	0.07
25 YR 72 HR	N-ASG-A06	7.13	7.13	0
25 YR 72 HR	N-ASG-B02	5.94	6.32	0.38
25 YR 72 HR	N-ASG-B03x	5.94	6.32	0.38
25 YR 72 HR	N-ASG-C04	6.54	6.62	0.08
25 YR 72 HR	N-ASG-C05	6.45	6.47	0.02
25 YR 72 HR	N-ASH-A01	5.94	6.32	0.38
25 YR 72 HR	N-ASH-A02	5.94	6.32	0.38
25 YR 72 HR	N-ASI-A01	5.47	5.54	0.07
25 YR 72 HR	N-ASJ	1.59	4.4	2.81
25 YR 72 HR	N-ASJ-A01	5.71	6.34	0.63
25 YR 72 HR	N-ASK-A01	5.55	6.34	0.79

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Area BCDE Baseline Future Conditions (BCDE)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA	1.59	4.4	2.81
10 yr 1 hr	N-BA-A01	3.33	4.43	1.1
10 yr 1 hr	N-BA-A02	3.37	4.44	1.07
10 yr 1 hr	N-BA-A03	3.4	4.45	1.05
10 yr 1 hr	N-BA-A03x	3.37	4.45	1.08
10 yr 1 hr	N-BA-A04	3.46	4.46	1
10 yr 1 hr	N-BA-A04x	3.4	4.46	1.06
10 yr 1 hr	N-BA-A05	3.46	4.47	1.01
10 yr 1 hr	N-BA-A06	3.58	4.48	0.9
10 yr 1 hr	N-BA-A07	3.65	4.48	0.83
10 yr 1 hr	N-BA-A07x	3.61	4.49	0.88
10 yr 1 hr	N-BA-A08	3.76	4.49	0.73
10 yr 1 hr	N-BA-A08x	3.65	4.49	0.84
10 yr 1 hr	N-BA-A09	3.91	4.58	0.67
10 yr 1 hr	N-BA-B02	3.26	4.41	1.15
10 yr 1 hr	N-BA-B03	3.26	4.41	1.15
10 yr 1 hr	N-BA-B04	3.25	4.41	1.16
10 yr 1 hr	N-BA-C03	3.33	4.44	1.11
10 yr 1 hr	N-BA-C04	3.32	4.43	1.11
10 yr 1 hr	N-BA-D05	3.48	4.47	0.99
10 yr 1 hr	N-BA-D06	3.49	4.48	0.99
10 yr 1 hr	N-BA-D07	3.65	4.5	0.85
10 yr 1 hr	N-BA-D08	3.72	4.49	0.77
10 yr 1 hr	N-BA-E09	3.76	4.49	0.73
10 yr 1 hr	N-BA-F09	3.87	4.48	0.61
10 yr 1 hr	N-BA-K04	3.39	4.46	1.07
10 yr 1 hr	N-BA-K05	3.41	4.47	1.06
10 yr 1 hr	N-BA-K06	3.6	4.47	0.87
10 yr 1 hr	N-BA-K08	5.06	5.09	0.03
10 yr 1 hr	N-BA-L06	3.54	4.46	0.92
10 yr 1 hr	N-BA-Q05	3.38	4.45	1.07
10 yr 1 hr	N-BA-Q06	3.38	4.45	1.07
10 yr 1 hr	N-BA-Q06x	3.38	4.45	1.07
10 yr 1 hr	N-BA-Q07	3.38	4.45	1.07
10 yr 1 hr	N-BA-Q07x	3.37	4.45	1.08
10 yr 1 hr	N-BA-Q08	3.39	4.46	1.07
10 yr 1 hr	N-BA-R06	3.39	4.46	1.07
10 yr 1 hr	N-BA-R07	3.38	4.46	1.08
10 yr 1 hr	N-BA-R07x	3.4	4.46	1.06
10 yr 1 hr	N-BA-R08	3.38	4.45	1.07
10 yr 1 hr	N-BA-R08x	3.39	4.46	1.07
10 yr 1 hr	N-BA-R09	3.38	4.46	1.08
10 yr 1 hr	N-BA-R10	3.38	4.45	1.07
10 yr 1 hr	N-BA-R11	3.37	4.45	1.08

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA-S06a	3.68	4.5	0.82
10 yr 1 hr	N-BA-T07	3.69	4.47	0.78
10 yr 1 hr	N-BA-T08	3.68	4.47	0.79
10 yr 1 hr	N-BA-T08x	3.69	4.47	0.78
10 yr 1 hr	N-BA-T09	3.4	4.46	1.06
10 yr 1 hr	N-BA-T09x	3.68	4.46	0.78
10 yr 1 hr	N-BA-T10	3.4	4.46	1.06
10 yr 1 hr	N-BA-U02	3.32	4.43	1.11
10 yr 1 hr	N-BA-U03	3.33	4.44	1.11
10 yr 1 hr	N-BA-V07	3.75	4.46	0.71
10 yr 1 hr	N-BA-W08	4.19	4.6	0.41
10 yr 1 hr	N-BA-W09A	4.2	4.62	0.42
10 yr 1 hr	N-BA-W09B	4.17	4.58	0.41
10 yr 1 hr	N-BB	1.59	4.4	2.81
10 yr 1 hr	N-BB-A01	3.32	4.44	1.12
10 yr 1 hr	N-BB-A02	3.33	4.44	1.11
10 yr 1 hr	N-BB-A03	3.31	4.43	1.12
10 yr 1 hr	N-BB-A04	3.32	4.43	1.11
10 yr 1 hr	N-BC	1.59	4.4	2.81
10 yr 1 hr	N-BC-A01	2.39	4.41	2.02
10 yr 1 hr	N-BC-A02	4.78	4.87	0.09
10 yr 1 hr	N-BD	1.59	4.4	2.81
10 yr 1 hr	N-BD-A01	3.33	4.42	1.09
10 yr 1 hr	N-BD-A02	3.36	4.44	1.08
10 yr 1 hr	N-BD-A02x	3.37	4.44	1.07
10 yr 1 hr	N-BD-A03	3.37	4.45	1.08
10 yr 1 hr	N-BD-A05	3.37	4.44	1.07
10 yr 1 hr	N-BD-B02	3.33	4.43	1.1
10 yr 1 hr	N-BD-B03	3.32	4.42	1.1
10 yr 1 hr	N-BD-B04	3.32	4.43	1.11
10 yr 1 hr	N-BD-B04x	3.32	4.42	1.1
10 yr 1 hr	N-BE	1.59	4.4	2.81
10 yr 1 hr	N-BE-A01	3.31	4.43	1.12
10 yr 1 hr	N-BE-A03	3.39	4.46	1.07
10 yr 1 hr	N-BE-A04	3.4	4.46	1.06
10 yr 1 hr	N-BF	1.59	4.4	2.81
10 yr 1 hr	N-BF-A01	3.9	4.52	0.62
10 yr 1 hr	N-CA	1.59	4.4	2.81
10 yr 1 hr	N-CA-A01c	5.81	5.81	0
10 yr 1 hr	N-CA-A01d	3.23	4.4	1.17
10 yr 1 hr	N-CA-A02	3.35	4.42	1.07
10 yr 1 hr	N-CA-A03	3.37	4.43	1.06
10 yr 1 hr	N-CA-A04	3.4	4.43	1.03
10 yr 1 hr	N-CA-A05	3.41	4.44	1.03

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-A07	4.72	4.91	0.19
10 yr 1 hr	N-CA-B03	3.36	4.42	1.06
10 yr 1 hr	N-CA-B04	3.38	4.43	1.05
10 yr 1 hr	N-CA-B07	4.35	4.84	0.49
10 yr 1 hr	N-CA-C03	3.13	4.41	1.28
10 yr 1 hr	N-CA-C04	3.11	4.42	1.31
10 yr 1 hr	N-CA-C05	3.14	4.42	1.28
10 yr 1 hr	N-CA-D06	3.62	4.44	0.82
10 yr 1 hr	N-CA-D07	3.62	4.43	0.81
10 yr 1 hr	N-CA-D07x	3.79	4.44	0.65
10 yr 1 hr	N-CA-D08	3.13	4.43	1.3
10 yr 1 hr	N-CA-D08x	3.64	4.44	0.8
10 yr 1 hr	N-CA-D09x	3.13	4.44	1.31
10 yr 1 hr	N-CA-E07	4.42	4.89	0.47
10 yr 1 hr	N-CA-E08	4.43	4.9	0.47
10 yr 1 hr	N-CA-E09x	4.57	5.07	0.5
10 yr 1 hr	N-CA-F04	3.37	4.43	1.06
10 yr 1 hr	N-CA-F05	3.09	4.42	1.33
10 yr 1 hr	N-CA-F05x	3.19	4.43	1.24
10 yr 1 hr	N-CA-F06	3.08	4.42	1.34
10 yr 1 hr	N-CA-F06x	3.07	4.42	1.35
10 yr 1 hr	N-CA-F07	3.08	4.42	1.34
10 yr 1 hr	N-CA-F07x	3.07	4.42	1.35
10 yr 1 hr	N-CA-F08	3.09	4.42	1.33
10 yr 1 hr	N-CA-F09	3.09	4.42	1.33
10 yr 1 hr	N-CA-F09x	3.09	4.42	1.33
10 yr 1 hr	N-CA-F10	3.1	4.42	1.32
10 yr 1 hr	N-CA-F11	3.1	4.42	1.32
10 yr 1 hr	N-CA-F11x	3.09	4.42	1.33
10 yr 1 hr	N-CA-F12	3.1	4.41	1.31
10 yr 1 hr	N-CA-F12x	3.1	4.42	1.32
10 yr 1 hr	N-CA-G08	3.1	4.43	1.33
10 yr 1 hr	N-CA-G09	3.1	4.43	1.33
10 yr 1 hr	N-CA-G10	3.39	4.43	1.04
10 yr 1 hr	N-CA-G11x	3.37	4.43	1.06
10 yr 1 hr	N-CA-H09	3.1	4.43	1.33
10 yr 1 hr	N-CA-H10	3.1	4.43	1.33
10 yr 1 hr	N-CA-H10x	3.1	4.42	1.32
10 yr 1 hr	N-CA-H11	3.12	4.43	1.31
10 yr 1 hr	N-CA-H11x	3.1	4.43	1.33
10 yr 1 hr	N-CA-H12	3.12	4.43	1.31
10 yr 1 hr	N-CA-H13	3.24	4.44	1.2
10 yr 1 hr	N-CA-H14	3.32	4.44	1.12
10 yr 1 hr	N-CA-I12	3.12	4.43	1.31

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-I13	3.12	4.43	1.31
10 yr 1 hr	N-CA-I14	3.12	4.43	1.31
10 yr 1 hr	N-CA-J14	3.26	4.43	1.17
10 yr 1 hr	N-CA-J15x	3.3	4.44	1.14
10 yr 1 hr	N-CA-K03	3.36	4.44	1.08
10 yr 1 hr	N-CA-L04	3.38	4.43	1.05
10 yr 1 hr	N-CA-L05	3.52	4.45	0.93
10 yr 1 hr	N-CA-M06	3.55	4.46	0.91
10 yr 1 hr	N-CA-N05	3.57	4.44	0.87
10 yr 1 hr	N-CA-O08	4.93	4.95	0.02
10 yr 1 hr	N-CA-S05	3.23	4.42	1.19
10 yr 1 hr	N-CA-T08	3.06	4.42	1.36
10 yr 1 hr	N-CA-T09	3.06	4.42	1.36
10 yr 1 hr	N-CB	1.59	4.4	2.81
10 yr 1 hr	N-CB-A01	3	4.41	1.41
10 yr 1 hr	N-CC	1.59	4.4	2.81
10 yr 1 hr	N-CC-A01	2.81	4.4	1.59
10 yr 1 hr	N-CC-A02	2.84	4.41	1.57
10 yr 1 hr	N-CC-A03	3.06	4.41	1.35
10 yr 1 hr	N-CE	1.59	4.4	2.81
10 yr 1 hr	N-CE-A01	3.1	4.42	1.32
10 yr 1 hr	N-CE-A02	3.1	4.42	1.32
10 yr 1 hr	N-CE-A03	3.1	4.42	1.32
10 yr 1 hr	N-CF	1.59	4.4	2.81
10 yr 1 hr	N-CF-A01	3.12	4.42	1.3
10 yr 1 hr	N-CF-A02	3.12	4.42	1.3
10 yr 1 hr	N-CF-A03x	3.12	4.43	1.31
10 yr 1 hr	N-CG	1.59	4.4	2.81
10 yr 1 hr	N-CG-A01	3.12	4.42	1.3
10 yr 1 hr	N-CG-A02x	3.12	4.42	1.3
10 yr 1 hr	N-CG-A03x	3.26	4.42	1.16
10 yr 1 hr	N-CH	1.59	4.4	2.81
10 yr 1 hr	N-CH-A01b	1.81	4.4	2.59
10 yr 1 hr	N-CH-A02	2.23	4.41	2.18
10 yr 1 hr	N-CH-A03	3.64	4.42	0.78
10 yr 1 hr	N-CH-A04	3.76	4.43	0.67
10 yr 1 hr	N-CH-B02	2.87	4.41	1.54
10 yr 1 hr	N-CH-B03	3.84	4.44	0.6
10 yr 1 hr	N-CH-B03x	2.89	4.41	1.52
10 yr 1 hr	N-CH-B04	3.91	4.45	0.54
10 yr 1 hr	N-CH-B04x	4.04	4.47	0.43
10 yr 1 hr	N-CH-B05	4.72	4.8	0.08
10 yr 1 hr	N-CH-B05x	3.99	4.48	0.49
10 yr 1 hr	N-CH-B06	4.88	4.89	0.01

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CH-B06x	4.82	4.83	0.01
10 yr 1 hr	N-CH-B07	5.89	5.9	0.01
10 yr 1 hr	N-CH-C04	3.75	4.43	0.68
10 yr 1 hr	N-CH-C05	3.77	4.44	0.67
10 yr 1 hr	N-CH-C05x1	3.77	4.43	0.66
10 yr 1 hr	N-CH-C05x2	3.77	4.43	0.66
10 yr 1 hr	N-CH-C05x3	3.77	4.43	0.66
10 yr 1 hr	N-CH-C06	3.78	4.45	0.67
10 yr 1 hr	N-CH-C06x	3.77	4.44	0.67
10 yr 1 hr	N-CH-C07x	3.77	4.45	0.68
10 yr 1 hr	N-CH-D05	3.77	4.43	0.66
10 yr 1 hr	N-CH-D06	3.77	4.43	0.66
10 yr 1 hr	N-CH-D08x	3.77	4.43	0.66
10 yr 1 hr	N-CH-E06	3.78	4.44	0.66
10 yr 1 hr	N-CH-E07	3.78	4.44	0.66
10 yr 1 hr	N-CH-F07	3.78	4.45	0.67
10 yr 1 hr	N-CH-F08	3.78	4.44	0.66
10 yr 1 hr	N-CH-G07	3.77	4.43	0.66
10 yr 1 hr	N-CH-G08	3.77	4.42	0.65
10 yr 1 hr	N-CH-G09	3.77	4.42	0.65
10 yr 1 hr	N-CH-G10	3.77	4.42	0.65
10 yr 1 hr	N-CH-G11	3.77	4.42	0.65
10 yr 1 hr	N-CH-I04	3.73	4.42	0.69
10 yr 1 hr	N-CH-I05x1	3.76	4.42	0.66
10 yr 1 hr	N-CH-I05x2	3.76	4.42	0.66
10 yr 1 hr	N-CH-I05x3	3.76	4.42	0.66
10 yr 1 hr	N-CH-I05x4	3.76	4.42	0.66
10 yr 1 hr	N-CI	1.59	4.4	2.81
10 yr 1 hr	N-D10	3.77	4.43	0.66
10 yr 1 hr	N-D16	2.53	4.4	1.87
10 yr 1 hr	N-D19	4.78	4.87	0.09
10 yr 1 hr	N-D20	4.77	4.87	0.1
10 yr 1 hr	N-D22	4.79	4.89	0.1
10 yr 1 hr	N-D30	4.76	4.85	0.09
10 yr 1 hr	N-DA	1.59	4.4	2.81
10 yr 1 hr	N-DA-A01	3.36	4.73	1.37
10 yr 1 hr	N-DB	1.59	4.4	2.81
10 yr 1 hr	N-DC	1.59	4.4	2.81
10 yr 1 hr	N-DI-A01	3.51	4.77	1.26
10 yr 1 hr	N-DI-A02	3.52	4.77	1.25
10 yr 1 hr	N-DI-B04	4.27	4.56	0.29
10 yr 1 hr	N-DI-B05	4.03	4.49	0.46
10 yr 1 hr	N-DI-B05x	4.71	4.8	0.09
10 yr 1 hr	N-DI-B06	4.04	4.5	0.46

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DI-B07	4.72	4.81	0.09
10 yr 1 hr	N-DI-B08	4.72	4.81	0.09
10 yr 1 hr	N-DI-B09	4.73	4.83	0.1
10 yr 1 hr	N-DI-B10	4.75	4.85	0.1
10 yr 1 hr	N-DI-B10x	4.73	4.83	0.1
10 yr 1 hr	N-DI-B11	4.74	4.84	0.1
10 yr 1 hr	N-DI-C03	3.55	4.77	1.22
10 yr 1 hr	N-DI-C04	4.78	4.88	0.1
10 yr 1 hr	N-DI-C05	4.52	4.77	0.25
10 yr 1 hr	N-DP	4.17	4.43	0.26
10 yr 1 hr	N-DP-A01	4.32	4.58	0.26
10 yr 1 hr	N-DP-A02	4.36	4.63	0.27
10 yr 1 hr	N-DP-A04	4.39	4.66	0.27
10 yr 1 hr	N-DP-A07	4.77	4.87	0.1
10 yr 1 hr	N-DP-A08	4.77	4.87	0.1
10 yr 1 hr	N-DP-A09	4.77	4.86	0.09
10 yr 1 hr	N-DP-A09x	4.77	4.87	0.1
10 yr 1 hr	N-DP-A10	4.76	4.86	0.1
10 yr 1 hr	N-DP-A11x	4.76	4.86	0.1
10 yr 1 hr	N-DP-B2	4.35	4.62	0.27
10 yr 1 hr	N-DP-C02	4.37	4.63	0.26
10 yr 1 hr	N-DP-C03	3.36	4.74	1.38
10 yr 1 hr	N-DP-C03x	4.37	4.63	0.26
10 yr 1 hr	N-DP-D02	4.43	4.68	0.25
10 yr 1 hr	N-DP-D03x	4.82	4.89	0.07
10 yr 1 hr	N-DP-D04	4.59	4.83	0.24
10 yr 1 hr	N-DP-D05x	4.64	4.86	0.22
10 yr 1 hr	N-DP-D05y	4.75	4.86	0.11
10 yr 1 hr	N-DP-D06x	4.71	4.91	0.2
10 yr 1 hr	N-DP-D06y	4.87	4.97	0.1
10 yr 1 hr	N-DP-D07x	4.81	4.98	0.17
10 yr 1 hr	N-DP-D07y	4.91	5.02	0.11
10 yr 1 hr	N-DP-D08x	4.89	5.04	0.15
10 yr 1 hr	N-DP-D08y	4.94	5.05	0.11
10 yr 1 hr	N-DP-D09	5.01	5.11	0.1
10 yr 1 hr	N-DP-D10	5.4	5.44	0.04
10 yr 1 hr	N-DP-E05	4.74	4.85	0.11
10 yr 1 hr	N-DP-E06	4.86	4.88	0.02
10 yr 1 hr	N-DP-E08	4.78	4.87	0.09
10 yr 1 hr	N-DP-F07	5.1	5.44	0.34
10 yr 1 hr	N-DP-F08	4.94	5.06	0.12
10 yr 1 hr	N-DP-F09	4.96	5.19	0.23
10 yr 1 hr	N-DP-G05	4.36	4.63	0.27
10 yr 1 hr	N-DP-G06	4.36	4.63	0.27

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DP-G07	4.36	4.63	0.27
10 yr 1 hr	N-DP-G07x	4.35	4.62	0.27
10 yr 1 hr	N-DP-G08	4.39	4.66	0.27
10 yr 1 hr	N-DP-G08x	4.36	4.63	0.27
10 yr 1 hr	N-DP-H04	4.36	4.63	0.27
10 yr 1 hr	N-DP-H05	4.36	4.62	0.26
10 yr 1 hr	N-DP-H05x	4.36	4.62	0.26
10 yr 1 hr	N-DP-H06	4.35	4.62	0.27
10 yr 1 hr	N-DP-H06x	4.36	4.63	0.27
10 yr 1 hr	N-DP-K07	4.36	4.62	0.26
10 yr 1 hr	N-DP-M10	5.11	5.18	0.07
10 yr 1 hr	N-DP-M11	5.2	5.24	0.04
10 yr 1 hr	N-DP-M12	5.25	5.29	0.04
10 yr 1 hr	N-DP-N10	4.89	5.04	0.15
10 yr 1 hr	N-DP-O10	4.77	4.87	0.1
10 yr 1 hr	N-DP-O11	4.88	4.88	0
10 yr 1 hr	N-DP-P06	4.6	4.66	0.06
10 yr 1 hr	N-DP-Y03	5.11	5.12	0.01
10 yr 1 hr	N-DP-Z12	4.26	4.56	0.3
10 yr 1 hr	N-DQ-A01	4.33	4.6	0.27
10 yr 1 hr	N-DQ-A02	4.34	4.6	0.26
10 yr 1 hr	N-DQ-A03	4.33	4.59	0.26
10 yr 1 hr	N-DQ-A03x	2.94	4.44	1.5
10 yr 1 hr	N-DQ-A04	5.32	5.6	0.28
10 yr 1 hr	N-DQ-A05	4.03	4.48	0.45
10 yr 1 hr	N-DQ-A06	4.33	4.6	0.27
10 yr 1 hr	N-DQ-A07	4.33	4.6	0.27
10 yr 1 hr	N-DQ-A08	4.33	4.6	0.27
10 yr 1 hr	N-E01	2.9	4.4	1.5
10 yr 1 hr	N-E02	3.35	4.4	1.05
10 yr 1 hr	N-E03	4	4.4	0.4
10 yr 1 hr	N-E07	4.49	4.53	0.04
10 yr 1 hr	N-E08	3.78	4.4	0.62
10 yr 1 hr	N-E10	3.71	4.4	0.69
10 yr 1 hr	N-E11	1.83	4.4	2.57
10 yr 1 hr	N-EA	1.59	4.4	2.81
10 yr 1 hr	N-EA-A01	3.81	4.41	0.6
10 yr 1 hr	N-EA-A02	3.81	4.41	0.6
10 yr 1 hr	N-EB	1.59	4.4	2.81
10 yr 1 hr	N-EB-A01	2.52	4.4	1.88
10 yr 1 hr	N-EC	1.59	4.4	2.81
10 yr 1 hr	N-EC-A01	2.69	4.4	1.71
10 yr 1 hr	N-ED	1.59	4.4	2.81
10 yr 1 hr	N-ED-A01	3.24	4.41	1.17

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-ED-A02	3.41	4.4	0.99
10 yr 1 hr	N-ED-A03	3.51	4.41	0.9
10 yr 1 hr	N-EE	1.59	4.4	2.81
10 yr 1 hr	N-EE-A01	3.66	4.41	0.75
10 yr 1 hr	N-EF	1.59	4.4	2.81
10 yr 1 hr	N-EF-A01	3.11	4.4	1.29
10 yr 1 hr	N-EG	1.59	4.4	2.81
10 yr 1 hr	N-EG-A01	3.43	4.4	0.97
10 yr 1 hr	N-EG-A02	3.62	4.4	0.78
10 yr 1 hr	N-EH	1.59	4.4	2.81
10 yr 1 hr	N-EH-A01	1.77	4.4	2.63
10 yr 1 hr	N-EI	1.59	4.4	2.81
10 yr 1 hr	N-EJ	1.59	4.4	2.81
10 yr 1 hr	N-EJ-A01	1.61	4.4	2.79
10 yr 1 hr	N-EK	1.59	4.4	2.81
10 yr 1 hr	N-EK-A01	3.68	4.4	0.72
10 yr 1 hr	N-EL	1.59	4.4	2.81
10 yr 1 hr	N-EL-A01	3.01	4.4	1.39
10 yr 1 hr	N-EM	1.59	4.4	2.81
10 yr 1 hr	N-EM-A01	2.63	4.4	1.77
10 yr 1 hr	N-EM-A02	2.61	4.4	1.79
10 yr 1 hr	N-EM-A03	2	4.4	2.4
10 yr 1 hr	N-EN	1.59	4.4	2.81
10 yr 1 hr	N-EN-A01	2.83	4.4	1.57
10 yr 1 hr	N-EO	1.59	4.4	2.81
10 yr 1 hr	N-EO-A01	2.22	4.4	2.18
10 yr 1 hr	N-EP	1.59	4.4	2.81
10 yr 1 hr	N-EP-A01	1.98	4.4	2.42
10 yr 1 hr	N-EQ	1.59	4.4	2.81
10 yr 1 hr	N-EQ-A01	1.65	4.41	2.76
10 yr 1 hr	N-ER	1.59	4.4	2.81
10 yr 1 hr	N-ES	1.59	4.4	2.81
10 yr 1 hr	N-ET	1.59	4.4	2.81
10 yr 1 hr	N-ET-A01	1.59	4.4	2.81

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA	1.59	4.4	2.81
25 yr 72 hr	N-BA-A01	3.55	4.44	0.89
25 yr 72 hr	N-BA-A02	3.6	4.46	0.86
25 yr 72 hr	N-BA-A03	3.64	4.46	0.82
25 yr 72 hr	N-BA-A03x	3.6	4.46	0.86
25 yr 72 hr	N-BA-A04	3.71	4.48	0.77
25 yr 72 hr	N-BA-A04x	3.63	4.47	0.84
25 yr 72 hr	N-BA-A05	3.72	4.49	0.77
25 yr 72 hr	N-BA-A06	3.78	4.5	0.72
25 yr 72 hr	N-BA-A07	3.82	4.51	0.69
25 yr 72 hr	N-BA-A07x	3.81	4.51	0.7
25 yr 72 hr	N-BA-A08	3.83	4.52	0.69
25 yr 72 hr	N-BA-A08x	3.82	4.52	0.7
25 yr 72 hr	N-BA-A09	4.01	4.6	0.59
25 yr 72 hr	N-BA-B02	3.41	4.42	1.01
25 yr 72 hr	N-BA-B03	3.41	4.42	1.01
25 yr 72 hr	N-BA-B04	3.39	4.41	1.02
25 yr 72 hr	N-BA-C03	3.57	4.45	0.88
25 yr 72 hr	N-BA-C04	3.57	4.44	0.87
25 yr 72 hr	N-BA-D05	3.73	4.49	0.76
25 yr 72 hr	N-BA-D06	3.75	4.5	0.75
25 yr 72 hr	N-BA-D07	3.85	4.53	0.68
25 yr 72 hr	N-BA-D08	3.89	4.52	0.63
25 yr 72 hr	N-BA-E09	3.83	4.52	0.69
25 yr 72 hr	N-BA-F09	3.88	4.5	0.62
25 yr 72 hr	N-BA-K04	3.69	4.47	0.78
25 yr 72 hr	N-BA-K05	3.72	4.49	0.77
25 yr 72 hr	N-BA-K06	3.78	4.49	0.71
25 yr 72 hr	N-BA-K08	5.08	5.09	0.01
25 yr 72 hr	N-BA-L06	3.76	4.48	0.72
25 yr 72 hr	N-BA-Q05	3.67	4.47	0.8
25 yr 72 hr	N-BA-Q06	3.66	4.47	0.81
25 yr 72 hr	N-BA-Q06x	3.67	4.47	0.8
25 yr 72 hr	N-BA-Q07	3.68	4.47	0.79
25 yr 72 hr	N-BA-Q07x	3.66	4.46	0.8
25 yr 72 hr	N-BA-Q08	3.68	4.47	0.79
25 yr 72 hr	N-BA-R06	3.69	4.48	0.79
25 yr 72 hr	N-BA-R07	3.68	4.47	0.79
25 yr 72 hr	N-BA-R07x	3.7	4.48	0.78
25 yr 72 hr	N-BA-R08	3.66	4.47	0.81
25 yr 72 hr	N-BA-R08x	3.68	4.48	0.8
25 yr 72 hr	N-BA-R09	3.67	4.47	0.8
25 yr 72 hr	N-BA-R10	3.67	4.47	0.8
25 yr 72 hr	N-BA-R11	3.65	4.46	0.81

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA-S06a	3.94	4.52	0.58
25 yr 72 hr	N-BA-T07	3.73	4.49	0.76
25 yr 72 hr	N-BA-T08	3.72	4.49	0.77
25 yr 72 hr	N-BA-T08x	3.73	4.49	0.76
25 yr 72 hr	N-BA-T09	3.69	4.48	0.79
25 yr 72 hr	N-BA-T09x	3.71	4.48	0.77
25 yr 72 hr	N-BA-T10	3.69	4.48	0.79
25 yr 72 hr	N-BA-U02	3.55	4.44	0.89
25 yr 72 hr	N-BA-U03	3.56	4.45	0.89
25 yr 72 hr	N-BA-V07	3.8	4.48	0.68
25 yr 72 hr	N-BA-W08	4.54	4.66	0.12
25 yr 72 hr	N-BA-W09A	4.55	4.67	0.12
25 yr 72 hr	N-BA-W09B	4.51	4.63	0.12
25 yr 72 hr	N-BB	1.59	4.4	2.81
25 yr 72 hr	N-BB-A01	3.6	4.45	0.85
25 yr 72 hr	N-BB-A02	3.59	4.45	0.86
25 yr 72 hr	N-BB-A03	3.57	4.43	0.86
25 yr 72 hr	N-BB-A04	3.58	4.44	0.86
25 yr 72 hr	N-BC	1.59	4.4	2.81
25 yr 72 hr	N-BC-A01	2.54	4.41	1.87
25 yr 72 hr	N-BC-A02	4.82	4.89	0.07
25 yr 72 hr	N-BD	1.59	4.4	2.81
25 yr 72 hr	N-BD-A01	3.59	4.43	0.84
25 yr 72 hr	N-BD-A02	3.64	4.46	0.82
25 yr 72 hr	N-BD-A02x	3.65	4.46	0.81
25 yr 72 hr	N-BD-A03	3.65	4.46	0.81
25 yr 72 hr	N-BD-A05	3.64	4.46	0.82
25 yr 72 hr	N-BD-B02	3.59	4.43	0.84
25 yr 72 hr	N-BD-B03	3.57	4.42	0.85
25 yr 72 hr	N-BD-B04	3.64	4.44	0.8
25 yr 72 hr	N-BD-B04x	3.57	4.43	0.86
25 yr 72 hr	N-BE	1.59	4.4	2.81
25 yr 72 hr	N-BE-A01	3.56	4.44	0.88
25 yr 72 hr	N-BE-A03	3.68	4.48	0.8
25 yr 72 hr	N-BE-A04	3.68	4.48	0.8
25 yr 72 hr	N-BF	1.59	4.4	2.81
25 yr 72 hr	N-BF-A01	4.06	4.56	0.5
25 yr 72 hr	N-CA	1.59	4.4	2.81
25 yr 72 hr	N-CA-A01c	5.81	5.81	0
25 yr 72 hr	N-CA-A01d	3.45	4.4	0.95
25 yr 72 hr	N-CA-A02	3.58	4.43	0.85
25 yr 72 hr	N-CA-A03	3.59	4.44	0.85
25 yr 72 hr	N-CA-A04	3.6	4.44	0.84
25 yr 72 hr	N-CA-A05	3.6	4.45	0.85

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-A07	5.04	5.14	0.1
25 yr 72 hr	N-CA-B03	3.59	4.43	0.84
25 yr 72 hr	N-CA-B04	3.6	4.44	0.84
25 yr 72 hr	N-CA-B07	4.7	5.03	0.33
25 yr 72 hr	N-CA-C03	3.38	4.42	1.04
25 yr 72 hr	N-CA-C04	3.35	4.42	1.07
25 yr 72 hr	N-CA-C05	3.39	4.42	1.03
25 yr 72 hr	N-CA-D06	3.64	4.45	0.81
25 yr 72 hr	N-CA-D07	3.65	4.44	0.79
25 yr 72 hr	N-CA-D07x	3.81	4.45	0.64
25 yr 72 hr	N-CA-D08	3.4	4.44	1.04
25 yr 72 hr	N-CA-D08x	3.66	4.45	0.79
25 yr 72 hr	N-CA-D09x	3.4	4.45	1.05
25 yr 72 hr	N-CA-E07	4.8	5.04	0.24
25 yr 72 hr	N-CA-E08	4.82	5.04	0.22
25 yr 72 hr	N-CA-E09x	5.03	5.13	0.1
25 yr 72 hr	N-CA-F04	3.56	4.44	0.88
25 yr 72 hr	N-CA-F05	3.36	4.43	1.07
25 yr 72 hr	N-CA-F05x	3.43	4.43	1
25 yr 72 hr	N-CA-F06	3.35	4.43	1.08
25 yr 72 hr	N-CA-F06x	3.33	4.43	1.1
25 yr 72 hr	N-CA-F07	3.34	4.43	1.09
25 yr 72 hr	N-CA-F07x	3.33	4.42	1.09
25 yr 72 hr	N-CA-F08	3.36	4.43	1.07
25 yr 72 hr	N-CA-F09	3.36	4.43	1.07
25 yr 72 hr	N-CA-F09x	3.36	4.43	1.07
25 yr 72 hr	N-CA-F10	3.37	4.43	1.06
25 yr 72 hr	N-CA-F11	3.37	4.42	1.05
25 yr 72 hr	N-CA-F11x	3.37	4.43	1.06
25 yr 72 hr	N-CA-F12	3.37	4.42	1.05
25 yr 72 hr	N-CA-F12x	3.37	4.42	1.05
25 yr 72 hr	N-CA-G08	3.37	4.44	1.07
25 yr 72 hr	N-CA-G09	3.38	4.44	1.06
25 yr 72 hr	N-CA-G10	3.58	4.44	0.86
25 yr 72 hr	N-CA-G11x	3.56	4.44	0.88
25 yr 72 hr	N-CA-H09	3.38	4.43	1.05
25 yr 72 hr	N-CA-H10	3.38	4.44	1.06
25 yr 72 hr	N-CA-H10x	3.37	4.43	1.06
25 yr 72 hr	N-CA-H11	3.39	4.44	1.05
25 yr 72 hr	N-CA-H11x	3.38	4.43	1.05
25 yr 72 hr	N-CA-H12	3.39	4.44	1.05
25 yr 72 hr	N-CA-H13	3.4	4.45	1.05
25 yr 72 hr	N-CA-H14	3.41	4.45	1.04
25 yr 72 hr	N-CA-I12	3.39	4.44	1.05

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-I13	3.39	4.44	1.05
25 yr 72 hr	N-CA-I14	3.39	4.44	1.05
25 yr 72 hr	N-CA-J14	3.4	4.44	1.04
25 yr 72 hr	N-CA-J15x	3.4	4.45	1.05
25 yr 72 hr	N-CA-K03	3.62	4.45	0.83
25 yr 72 hr	N-CA-L04	3.6	4.44	0.84
25 yr 72 hr	N-CA-L05	3.73	4.47	0.74
25 yr 72 hr	N-CA-M06	3.77	4.48	0.71
25 yr 72 hr	N-CA-N05	3.66	4.45	0.79
25 yr 72 hr	N-CA-O08	4.98	4.99	0.01
25 yr 72 hr	N-CA-S05	3.41	4.43	1.02
25 yr 72 hr	N-CA-T08	3.32	4.42	1.1
25 yr 72 hr	N-CA-T09	3.32	4.42	1.1
25 yr 72 hr	N-CB	1.59	4.4	2.81
25 yr 72 hr	N-CB-A01	3.19	4.41	1.22
25 yr 72 hr	N-CC	1.59	4.4	2.81
25 yr 72 hr	N-CC-A01	3.15	4.41	1.26
25 yr 72 hr	N-CC-A02	3.18	4.41	1.23
25 yr 72 hr	N-CC-A03	3.31	4.42	1.11
25 yr 72 hr	N-CE	1.59	4.4	2.81
25 yr 72 hr	N-CE-A01	3.37	4.43	1.06
25 yr 72 hr	N-CE-A02	3.37	4.43	1.06
25 yr 72 hr	N-CE-A03	3.37	4.43	1.06
25 yr 72 hr	N-CF	1.59	4.4	2.81
25 yr 72 hr	N-CF-A01	3.38	4.43	1.05
25 yr 72 hr	N-CF-A02	3.38	4.43	1.05
25 yr 72 hr	N-CF-A03x	3.38	4.43	1.05
25 yr 72 hr	N-CG	1.59	4.4	2.81
25 yr 72 hr	N-CG-A01	3.38	4.43	1.05
25 yr 72 hr	N-CG-A02x	3.39	4.43	1.04
25 yr 72 hr	N-CG-A03x	3.39	4.43	1.04
25 yr 72 hr	N-CH	1.59	4.4	2.81
25 yr 72 hr	N-CH-A01b	1.88	4.41	2.53
25 yr 72 hr	N-CH-A02	2.75	4.41	1.66
25 yr 72 hr	N-CH-A03	3.93	4.43	0.5
25 yr 72 hr	N-CH-A04	4.03	4.43	0.4
25 yr 72 hr	N-CH-B02	2.96	4.41	1.45
25 yr 72 hr	N-CH-B03	3.9	4.45	0.55
25 yr 72 hr	N-CH-B03x	3.08	4.42	1.34
25 yr 72 hr	N-CH-B04	3.94	4.46	0.52
25 yr 72 hr	N-CH-B04x	4.12	4.48	0.36
25 yr 72 hr	N-CH-B05	4.75	4.82	0.07
25 yr 72 hr	N-CH-B05x	4.05	4.49	0.44
25 yr 72 hr	N-CH-B06	4.88	4.91	0.03

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CH-B06x	4.83	4.85	0.02
25 yr 72 hr	N-CH-B07	5.93	5.94	0.01
25 yr 72 hr	N-CH-C04	4.02	4.44	0.42
25 yr 72 hr	N-CH-C05	4.04	4.46	0.42
25 yr 72 hr	N-CH-C05x1	4.03	4.44	0.41
25 yr 72 hr	N-CH-C05x2	4.03	4.44	0.41
25 yr 72 hr	N-CH-C05x3	4.03	4.44	0.41
25 yr 72 hr	N-CH-C06	4.04	4.46	0.42
25 yr 72 hr	N-CH-C06x	4.04	4.46	0.42
25 yr 72 hr	N-CH-C07x	4.04	4.46	0.42
25 yr 72 hr	N-CH-D05	4.03	4.44	0.41
25 yr 72 hr	N-CH-D06	4.03	4.44	0.41
25 yr 72 hr	N-CH-D08x	4.04	4.44	0.4
25 yr 72 hr	N-CH-E06	4.04	4.46	0.42
25 yr 72 hr	N-CH-E07	4.04	4.45	0.41
25 yr 72 hr	N-CH-F07	4.05	4.46	0.41
25 yr 72 hr	N-CH-F08	4.05	4.46	0.41
25 yr 72 hr	N-CH-G07	4.03	4.44	0.41
25 yr 72 hr	N-CH-G08	4.03	4.43	0.4
25 yr 72 hr	N-CH-G09	4.02	4.42	0.4
25 yr 72 hr	N-CH-G10	4.02	4.42	0.4
25 yr 72 hr	N-CH-G11	4.03	4.43	0.4
25 yr 72 hr	N-CH-I04	3.99	4.43	0.44
25 yr 72 hr	N-CH-I05x1	4.02	4.43	0.41
25 yr 72 hr	N-CH-I05x2	4.01	4.42	0.41
25 yr 72 hr	N-CH-I05x3	4.01	4.42	0.41
25 yr 72 hr	N-CH-I05x4	4.02	4.43	0.41
25 yr 72 hr	N-CI	1.59	4.4	2.81
25 yr 72 hr	N-D10	4.03	4.44	0.41
25 yr 72 hr	N-D16	2.55	4.41	1.86
25 yr 72 hr	N-D19	4.89	4.94	0.05
25 yr 72 hr	N-D20	4.89	4.94	0.05
25 yr 72 hr	N-D22	4.86	4.92	0.06
25 yr 72 hr	N-D30	4.87	4.93	0.06
25 yr 72 hr	N-DA	1.59	4.4	2.81
25 yr 72 hr	N-DA-A01	3.76	4.78	1.02
25 yr 72 hr	N-DB	1.59	4.4	2.81
25 yr 72 hr	N-DC	1.59	4.4	2.81
25 yr 72 hr	N-DI-A01	3.98	4.81	0.83
25 yr 72 hr	N-DI-A02	4.02	4.82	0.8
25 yr 72 hr	N-DI-B04	4.51	4.65	0.14
25 yr 72 hr	N-DI-B05	4.32	4.55	0.23
25 yr 72 hr	N-DI-B05x	4.83	4.88	0.05
25 yr 72 hr	N-DI-B06	4.33	4.56	0.23

Kimley»Horn

Area BCDE Baseline Future Conditions(BCDE)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DI-B07	4.83	4.88	0.05
25 yr 72 hr	N-DI-B08	4.83	4.88	0.05
25 yr 72 hr	N-DI-B09	4.85	4.9	0.05
25 yr 72 hr	N-DI-B10	4.87	4.92	0.05
25 yr 72 hr	N-DI-B10x	4.85	4.9	0.05
25 yr 72 hr	N-DI-B11	4.86	4.91	0.05
25 yr 72 hr	N-DI-C03	4.09	4.83	0.74
25 yr 72 hr	N-DI-C04	4.86	4.92	0.06
25 yr 72 hr	N-DI-C05	4.76	4.85	0.09
25 yr 72 hr	N-DP	4.39	4.49	0.1
25 yr 72 hr	N-DP-A01	4.54	4.64	0.1
25 yr 72 hr	N-DP-A02	4.59	4.69	0.1
25 yr 72 hr	N-DP-A04	4.62	4.72	0.1
25 yr 72 hr	N-DP-A07	4.89	4.95	0.06
25 yr 72 hr	N-DP-A08	4.89	4.94	0.05
25 yr 72 hr	N-DP-A09	4.88	4.93	0.05
25 yr 72 hr	N-DP-A09x	4.89	4.94	0.05
25 yr 72 hr	N-DP-A10	4.88	4.93	0.05
25 yr 72 hr	N-DP-A11x	4.88	4.93	0.05
25 yr 72 hr	N-DP-B2	4.57	4.68	0.11
25 yr 72 hr	N-DP-C02	4.59	4.69	0.1
25 yr 72 hr	N-DP-C03	3.76	4.78	1.02
25 yr 72 hr	N-DP-C03x	4.59	4.69	0.1
25 yr 72 hr	N-DP-D02	4.64	4.75	0.11
25 yr 72 hr	N-DP-D03x	4.87	4.92	0.05
25 yr 72 hr	N-DP-D04	4.85	4.92	0.07
25 yr 72 hr	N-DP-D05x	4.88	4.95	0.07
25 yr 72 hr	N-DP-D05y	4.9	4.95	0.05
25 yr 72 hr	N-DP-D06x	4.94	5.01	0.07
25 yr 72 hr	N-DP-D06y	5.03	5.06	0.03
25 yr 72 hr	N-DP-D07x	5.03	5.08	0.05
25 yr 72 hr	N-DP-D07y	5.09	5.12	0.03
25 yr 72 hr	N-DP-D08x	5.1	5.14	0.04
25 yr 72 hr	N-DP-D08y	5.13	5.16	0.03
25 yr 72 hr	N-DP-D09	5.19	5.22	0.03
25 yr 72 hr	N-DP-D10	5.55	5.56	0.01
25 yr 72 hr	N-DP-E05	4.89	4.94	0.05
25 yr 72 hr	N-DP-E06	4.92	4.97	0.05
25 yr 72 hr	N-DP-E08	4.89	4.95	0.06
25 yr 72 hr	N-DP-F07	5.89	5.9	0.01
25 yr 72 hr	N-DP-F08	5.13	5.16	0.03
25 yr 72 hr	N-DP-F09	5.37	5.48	0.11
25 yr 72 hr	N-DP-G05	4.58	4.69	0.11
25 yr 72 hr	N-DP-G06	4.58	4.69	0.11

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DP-G07	4.58	4.69	0.11
25 yr 72 hr	N-DP-G07x	4.57	4.68	0.11
25 yr 72 hr	N-DP-G08	4.62	4.73	0.11
25 yr 72 hr	N-DP-G08x	4.58	4.69	0.11
25 yr 72 hr	N-DP-H04	4.58	4.69	0.11
25 yr 72 hr	N-DP-H05	4.58	4.68	0.1
25 yr 72 hr	N-DP-H05x	4.58	4.68	0.1
25 yr 72 hr	N-DP-H06	4.57	4.68	0.11
25 yr 72 hr	N-DP-H06x	4.58	4.69	0.11
25 yr 72 hr	N-DP-K07	4.58	4.68	0.1
25 yr 72 hr	N-DP-M10	5.26	5.28	0.02
25 yr 72 hr	N-DP-M11	5.31	5.32	0.01
25 yr 72 hr	N-DP-M12	5.38	5.39	0.01
25 yr 72 hr	N-DP-N10	5.12	5.16	0.04
25 yr 72 hr	N-DP-O10	4.88	4.94	0.06
25 yr 72 hr	N-DP-O11	4.89	4.94	0.05
25 yr 72 hr	N-DP-P06	4.64	4.7	0.06
25 yr 72 hr	N-DP-Y03	5.12	5.12	0
25 yr 72 hr	N-DP-Z12	4.4	4.62	0.22
25 yr 72 hr	N-DQ-A01	4.55	4.66	0.11
25 yr 72 hr	N-DQ-A02	4.56	4.66	0.1
25 yr 72 hr	N-DQ-A03	4.55	4.65	0.1
25 yr 72 hr	N-DQ-A03x	3.13	4.46	1.33
25 yr 72 hr	N-DQ-A04	5.57	5.68	0.11
25 yr 72 hr	N-DQ-A05	4.36	4.51	0.15
25 yr 72 hr	N-DQ-A06	4.55	4.66	0.11
25 yr 72 hr	N-DQ-A07	4.55	4.65	0.1
25 yr 72 hr	N-DQ-A08	4.55	4.66	0.11
25 yr 72 hr	N-E01	2.93	4.4	1.47
25 yr 72 hr	N-E02	3.39	4.4	1.01
25 yr 72 hr	N-E03	4.02	4.4	0.38
25 yr 72 hr	N-E07	4.54	4.54	0
25 yr 72 hr	N-E08	3.82	4.4	0.58
25 yr 72 hr	N-E10	3.74	4.4	0.66
25 yr 72 hr	N-E11	2.57	4.4	1.83
25 yr 72 hr	N-EA	1.59	4.4	2.81
25 yr 72 hr	N-EA-A01	3.86	4.41	0.55
25 yr 72 hr	N-EA-A02	3.86	4.41	0.55
25 yr 72 hr	N-EB	1.59	4.4	2.81
25 yr 72 hr	N-EB-A01	3.03	4.4	1.37
25 yr 72 hr	N-EC	1.59	4.4	2.81
25 yr 72 hr	N-EC-A01	3.11	4.4	1.29
25 yr 72 hr	N-ED	1.59	4.4	2.81
25 yr 72 hr	N-ED-A01	3.63	4.41	0.78

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-ED-A02	3.64	4.4	0.76
25 yr 72 hr	N-ED-A03	3.64	4.41	0.77
25 yr 72 hr	N-EE	1.59	4.4	2.81
25 yr 72 hr	N-EE-A01	3.71	4.41	0.7
25 yr 72 hr	N-EF	1.59	4.4	2.81
25 yr 72 hr	N-EF-A01	3.71	4.4	0.69
25 yr 72 hr	N-EG	1.59	4.4	2.81
25 yr 72 hr	N-EG-A01	3.46	4.4	0.94
25 yr 72 hr	N-EG-A02	3.66	4.4	0.74
25 yr 72 hr	N-EH	1.59	4.4	2.81
25 yr 72 hr	N-EH-A01	2.02	4.4	2.38
25 yr 72 hr	N-EI	1.59	4.4	2.81
25 yr 72 hr	N-EJ	1.59	4.4	2.81
25 yr 72 hr	N-EJ-A01	1.65	4.4	2.75
25 yr 72 hr	N-EK	1.59	4.4	2.81
25 yr 72 hr	N-EK-A01	3.76	4.4	0.64
25 yr 72 hr	N-EL	1.59	4.4	2.81
25 yr 72 hr	N-EL-A01	3.04	4.4	1.36
25 yr 72 hr	N-EM	1.59	4.4	2.81
25 yr 72 hr	N-EM-A01	2.83	4.4	1.57
25 yr 72 hr	N-EM-A02	2.74	4.4	1.66
25 yr 72 hr	N-EM-A03	2.57	4.4	1.83
25 yr 72 hr	N-EN	1.59	4.4	2.81
25 yr 72 hr	N-EN-A01	2.92	4.4	1.48
25 yr 72 hr	N-EO	1.59	4.4	2.81
25 yr 72 hr	N-EO-A01	2.46	4.4	1.94
25 yr 72 hr	N-EP	1.59	4.4	2.81
25 yr 72 hr	N-EP-A01	2.56	4.4	1.84
25 yr 72 hr	N-EQ	1.59	4.4	2.81
25 yr 72 hr	N-EQ-A01	1.67	4.42	2.75
25 yr 72 hr	N-ER	1.59	4.4	2.81
25 yr 72 hr	N-ES	1.59	4.4	2.81
25 yr 72 hr	N-ET	1.59	4.4	2.81
25 yr 72 hr	N-ET-A01	1.6	4.4	2.8

Improvement Alternatives with Future Condition Tailwater

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Area A Improvement Projects Future Conditions Tailwater Selected Alternative (A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	Added-Junction-1	#N/A	6.56	#N/A
10 YR 1 HR	N-ABA	1.59	4.4	2.81
10 YR 1 HR	N-ABA-A01	3.66	4.81	1.15
10 YR 1 HR	N-ABA-A02	3.83	4.81	0.98
10 YR 1 HR	N-ABB	1.59	4.4	2.81
10 YR 1 HR	N-ABB-A01	3.57	4.68	1.11
10 YR 1 HR	N-ABB-A02	4.23	4.81	0.58
10 YR 1 HR	N-ABB-A03	4.23	4.81	0.58
10 YR 1 HR	N-ABB-A04	4.23	4.81	0.58
10 YR 1 HR	N-ABB-B02	4.25	4.83	0.58
10 YR 1 HR	N-ABB-B03	4.27	4.83	0.56
10 YR 1 HR	N-ABB-B03x	4.28	4.83	0.55
10 YR 1 HR	N-ABB-B04	4.28	4.83	0.55
10 YR 1 HR	N-ABC	1.59	4.4	2.81
10 YR 1 HR	N-ABC-A01	4.21	4.79	0.58
10 YR 1 HR	N-ABC-A02	4.22	4.79	0.57
10 YR 1 HR	N-ABC-B02	4.21	4.79	0.58
10 YR 1 HR	N-ABD	1.59	4.4	2.81
10 YR 1 HR	N-ABD-A01	3.33	4.8	1.47
10 YR 1 HR	N-ABD-A02	4.06	4.8	0.74
10 YR 1 HR	N-ABD-A02x	3.76	4.8	1.04
10 YR 1 HR	N-ABD-A03	4.64	5.07	0.43
10 YR 1 HR	N-ABD-A03x	4.11	4.8	0.69
10 YR 1 HR	N-ABD-A04	4.95	5.09	0.14
10 YR 1 HR	N-ABD-A05	5.18	5.19	0.01
10 YR 1 HR	N-ABD-A06	5.19	5.1	-0.09
10 YR 1 HR	N-ABD-A07	5.19	5.1	-0.09
10 YR 1 HR	N-ABD-B04	5.43	5.29	-0.14
10 YR 1 HR	N-ABD-B05	5.52	5.37	-0.15
10 YR 1 HR	N-ABD-B05x	5.43	5.28	-0.15
10 YR 1 HR	N-ABD-B06	5.53	5.38	-0.15
10 YR 1 HR	N-ABD-B07	6.17	6.06	-0.11
10 YR 1 HR	N-ABD-B08	7.41	7.41	0
10 YR 1 HR	N-ABE	1.59	4.4	2.81
10 YR 1 HR	N-ABE-A01	2.05	4.79	2.74
10 YR 1 HR	N-ABE-A02	2.68	4.79	2.11
10 YR 1 HR	N-ABF	1.59	4.4	2.81
10 YR 1 HR	N-ABF-A01	4.11	4.78	0.67
10 YR 1 HR	N-ABF-A02	4.11	4.78	0.67
10 YR 1 HR	N-ABG	1.59	4.4	2.81
10 YR 1 HR	N-ABG-A01	4.53	4.8	0.27
10 YR 1 HR	N-ABG-A02	4.76	4.81	0.05
10 YR 1 HR	N-ABG-A03	4.79	4.82	0.03
10 YR 1 HR	N-ABH	1.59	4.4	2.81

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Area A Improvement Projects Future Conditions Tailwater Selected Alternative (A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ABH-A01	4.07	4.56	0.49
10 YR 1 HR	N-ABH-A02	4.98	4.56	-0.42
10 YR 1 HR	N-ABH-A03	4.98	4.57	-0.41
10 YR 1 HR	N-ABH-A03x	4.98	4.63	-0.35
10 YR 1 HR	N-ABH-B02	5.02	4.87	-0.15
10 YR 1 HR	N-ABH-B03	5.03	4.92	-0.11
10 YR 1 HR	N-ABH-B03x	5.03	4.88	-0.15
10 YR 1 HR	N-ABH-B04	5.04	4.93	-0.11
10 YR 1 HR	N-ABI	1.59	4.4	2.81
10 YR 1 HR	N-ABI-A01	4.93	4.59	-0.34
10 YR 1 HR	N-ABI-A02	4.93	4.59	-0.34
10 YR 1 HR	N-ABJ	1.59	4.4	2.81
10 YR 1 HR	N-ABJ-A01	4.95	4.57	-0.38
10 YR 1 HR	N-ABJ-A02	4.95	4.58	-0.37
10 YR 1 HR	N-ABK	1.59	4.4	2.81
10 YR 1 HR	N-ABK-A01	3.71	5.41	1.7
10 YR 1 HR	N-ABK-A02x1	5.66	6.55	0.89
10 YR 1 HR	N-ABK-A02x2	5.67	6.57	0.9
10 YR 1 HR	N-ABK-B02	4.99	5.14	0.15
10 YR 1 HR	N-ABK-B03	4.99	5.14	0.15
10 YR 1 HR	N-ABK-B04	7.48	6.47	-1.01
10 YR 1 HR	N-ABL	1.59	4.4	2.81
10 YR 1 HR	N-ABL-A01	3.41	4.95	1.54
10 YR 1 HR	N-ABL-A02	4.33	4.95	0.62
10 YR 1 HR	N-ABM	1.59	4.4	2.81
10 YR 1 HR	N-ABM-A01	4.74	4.93	0.19
10 YR 1 HR	N-ABM-A02	4.74	4.93	0.19
10 YR 1 HR	N-ABN	1.59	4.4	2.81
10 YR 1 HR	N-ABN-A01	9.68	9.51	-0.17
10 YR 1 HR	N-ABO	1.59	4.4	2.81
10 YR 1 HR	N-ABO-A01	3.81	5.2	1.39
10 YR 1 HR	N-ABO-A02	5.2	6.11	0.91
10 YR 1 HR	N-ABP	1.59	4.4	2.81
10 YR 1 HR	N-ABQ	1.59	4.4	2.81
10 YR 1 HR	N-ADA-A01	6.1	6.55	0.45
10 YR 1 HR	N-ADA-A02	6.92	6.57	-0.35
10 YR 1 HR	N-ADA-A03	6.93	6.57	-0.36
10 YR 1 HR	N-ADA-A03x	6.92	6.57	-0.35
10 YR 1 HR	N-ADA-A04	6.94	6.58	-0.36
10 YR 1 HR	N-ADA-A05	6.94	6.58	-0.36
10 YR 1 HR	N-ADA-B02	6.57	6.47	-0.1
10 YR 1 HR	N-ADA-B03	6.57	6.46	-0.11
10 YR 1 HR	N-ADA-B03x	6.57	6.46	-0.11
10 YR 1 HR	N-ADA-B04	7.22	6.47	-0.75

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Area A Improvement Projects Future Conditions Tailwater Selected Alternative (A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADB-08	7.07	7.06	-0.01
10 YR 1 HR	N-ADB-A01	7.3	6.67	-0.63
10 YR 1 HR	N-ADB-A02	7.48	6.71	-0.77
10 YR 1 HR	N-ADB-A03	8.47	6.73	-1.74
10 YR 1 HR	N-ADB-A04	8.84	6.73	-2.11
10 YR 1 HR	N-ADB-A04x	8.76	6.73	-2.03
10 YR 1 HR	N-ADB-B03	7.49	6.86	-0.63
10 YR 1 HR	N-ADB-B04	8.83	7.27	-1.56
10 YR 1 HR	N-ADB-B05	8.86	8.05	-0.81
10 YR 1 HR	N-ADB-B06	9.16	9.09	-0.07
10 YR 1 HR	N-ADB-B07	9.7	9.53	-0.17
10 YR 1 HR	N-ADB-B07x	9.66	9.5	-0.16
10 YR 1 HR	N-ADC-A01	7.96	6.56	-1.4
10 YR 1 HR	N-ADC-A02	7.97	6.57	-1.4
10 YR 1 HR	N-ADD-A01	7.8	7.08	-0.72
10 YR 1 HR	N-ADD-A02	7.93	7.31	-0.62
10 YR 1 HR	N-ADD-A03	10.93	8.63	-2.3
10 YR 1 HR	N-ADD-A04	10.93	9.02	-1.91
10 YR 1 HR	N-ADD-A04x	10.93	8.64	-2.29
10 YR 1 HR	N-ADD-A05	10.98	9.63	-1.35
10 YR 1 HR	N-ADD-A06	10.99	10.25	-0.74
10 YR 1 HR	N-ADD-A07	12.51	11.13	-1.38
10 YR 1 HR	N-ADD-A08	12.53	11.48	-1.05
10 YR 1 HR	N-ADD-A09	12.59	11.74	-0.85
10 YR 1 HR	N-ADD-A10	12.59	12.01	-0.58
10 YR 1 HR	N-ADD-A11	12.64	12.31	-0.33
10 YR 1 HR	N-ADD-A12	13.08	12.62	-0.46
10 YR 1 HR	N-ADD-A13	13.36	13.02	-0.34
10 YR 1 HR	N-ADD-A14	13.37	13.04	-0.33
10 YR 1 HR	N-ADD-A15	13.35	13.02	-0.33
10 YR 1 HR	N-ADD-A16	13.25	13.01	-0.24
10 YR 1 HR	N-ADD-B03	7.95	7.34	-0.61
10 YR 1 HR	N-ADD-B05	11.67	11.67	0
10 YR 1 HR	N-ADD-C04	10.94	10.66	-0.28
10 YR 1 HR	N-ADD-C05	11.24	11.24	0
10 YR 1 HR	N-ADD-D08	12.01	11.41	-0.6
10 YR 1 HR	N-ADD-D09	11.87	11.72	-0.15
10 YR 1 HR	N-ADD-H04	10.93	10.43	-0.5
10 YR 1 HR	N-ADD-N13	12.88	12.64	-0.24
10 YR 1 HR	N-ADD-N14	13.15	12.73	-0.42
10 YR 1 HR	N-ADD-N15	12.55	12.69	0.14
10 YR 1 HR	N-ADE-A01	6.96	6.78	-0.18
10 YR 1 HR	N-ADE-A02	8.4	7.06	-1.34
10 YR 1 HR	N-ADE-A03	8.68	7.29	-1.39

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Area A Improvement Projects Future Conditions Tailwater Selected Alternative (A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADE-A04	9.1	8.37	-0.73
10 YR 1 HR	N-ADE-A04x	8.7	7.29	-1.41
10 YR 1 HR	N-ADE-A05	10.84	10.84	0
10 YR 1 HR	N-ADE-A05x	9.1	8.38	-0.72
10 YR 1 HR	N-ADE-A06	11.2	11.2	0
10 YR 1 HR	N-ADE-B02	7.01	6.79	-0.22
10 YR 1 HR	N-ADE-B03	7.02	6.79	-0.23
10 YR 1 HR	N-ADE-C02	7.52	6.8	-0.72
10 YR 1 HR	N-ADE-C03	7.54	6.84	-0.7
10 YR 1 HR	N-ADE-D03	7	6.8	-0.2
10 YR 1 HR	N-ADS-A01	5.67	6.37	0.7
10 YR 1 HR	N-ADS-A02	5.99	6.37	0.38
10 YR 1 HR	N-ASA-A01	5.41	5.97	0.56
10 YR 1 HR	N-ASA-A02	5.41	5.97	0.56
10 YR 1 HR	N-ASA-A03	5.61	5.97	0.36
10 YR 1 HR	N-ASA-A04	5.72	5.98	0.26
10 YR 1 HR	N-ASA-A05	5.89	5.99	0.1
10 YR 1 HR	N-ASA-A06	6.09	6	-0.09
10 YR 1 HR	N-ASA-A07	6.12	6	-0.12
10 YR 1 HR	N-ASB-A01	5.55	5.99	0.44
10 YR 1 HR	N-ASB-A02	5.55	5.99	0.44
10 YR 1 HR	N-ASB-B02	5.8	5.99	0.19
10 YR 1 HR	N-ASC-A01	5.32	6.3	0.98
10 YR 1 HR	N-ASC-A02	5.99	6.61	0.62
10 YR 1 HR	N-ASC-A03	6.24	6.65	0.41
10 YR 1 HR	N-ASC-A04	6.5	6.67	0.17
10 YR 1 HR	N-ASC-B02	5.61	6.3	0.69
10 YR 1 HR	N-ASC-B03	5.65	6.32	0.67
10 YR 1 HR	N-ASD-A01a	5.82	6.77	0.95
10 YR 1 HR	N-ASD-A02	8.07	8.71	0.64
10 YR 1 HR	N-ASD-A03	8.89	9.4	0.51
10 YR 1 HR	N-ASD-A04	9.95	10.29	0.34
10 YR 1 HR	N-ASD-A05	10.3	10.59	0.29
10 YR 1 HR	N-ASD-A06	10.99	11.24	0.25
10 YR 1 HR	N-ASD-A07	11.55	11.73	0.18
10 YR 1 HR	N-ASD-A08	12.21	12.31	0.1
10 YR 1 HR	N-ASD-A09	13.04	13.08	0.04
10 YR 1 HR	N-ASD-A11	14.02	14.01	-0.01
10 YR 1 HR	N-ASD-A12	14.91	14.9	-0.01
10 YR 1 HR	N-ASD-A13	15.49	15.48	-0.01
10 YR 1 HR	N-ASD-A14	15.82	15.81	-0.01
10 YR 1 HR	N-ASD-A15	16.4	16.4	0
10 YR 1 HR	N-ASD-A16	14.3	14.3	0
10 YR 1 HR	N-ASD-A17	16.61	16.61	0

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Area A Improvement Projects Future Conditions Tailwater Selected Alternative (A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASD-A18	15.58	15.58	0
10 YR 1 HR	N-ASD-A19	14.92	14.92	0
10 YR 1 HR	N-ASD-B02	5.9	6.82	0.92
10 YR 1 HR	N-ASD-B03	7.08	7.73	0.65
10 YR 1 HR	N-ASD-B04	7.52	8	0.48
10 YR 1 HR	N-ASD-B05	8.63	8.67	0.04
10 YR 1 HR	N-ASD-C03	6.06	6.81	0.75
10 YR 1 HR	N-ASD-C04	6.08	6.43	0.35
10 YR 1 HR	N-ASD-D04	7.85	8.25	0.4
10 YR 1 HR	N-ASD-D05	8.43	8.5	0.07
10 YR 1 HR	N-ASD-D06	8.14	8.18	0.04
10 YR 1 HR	N-ASD-D07	8.49	8.54	0.05
10 YR 1 HR	N-ASD-E04	9.39	9.82	0.43
10 YR 1 HR	N-ASD-E05	10.23	10.53	0.3
10 YR 1 HR	N-ASD-E06	10.4	10.67	0.27
10 YR 1 HR	N-ASD-E09	14.14	14.14	0
10 YR 1 HR	N-ASD-E10	13.84	13.84	0
10 YR 1 HR	N-ASD-F03	8.62	9.13	0.51
10 YR 1 HR	N-ASD-F04	9.24	9.28	0.04
10 YR 1 HR	N-ASD-F05	9.67	9.68	0.01
10 YR 1 HR	N-ASD-G04	8.9	9.41	0.51
10 YR 1 HR	N-ASD-H07	9.29	9.29	0
10 YR 1 HR	N-ASD-H08	9.42	9.42	0
10 YR 1 HR	N-ASD-I09	10.85	10.86	0.01
10 YR 1 HR	N-ASD-J10	12.51	12.51	0
10 YR 1 HR	N-ASD-K10	13.86	13.86	0
10 YR 1 HR	N-ASD-L07	10.46	10.41	-0.05
10 YR 1 HR	N-ASD-Q06	10.32	10.59	0.27
10 YR 1 HR	N-ASD-Q08	11.23	11.44	0.21
10 YR 1 HR	N-ASD-Q09	12.64	12.68	0.04
10 YR 1 HR	N-ASD-R13	14.22	14.22	0
10 YR 1 HR	N-ASD-S13	14.84	14.84	0
10 YR 1 HR	N-ASD-T15	16.56	16.56	0
10 YR 1 HR	N-ASD-U06	10.26	10.55	0.29
10 YR 1 HR	N-ASE-A01	5.62	6.57	0.95
10 YR 1 HR	N-ASE-A02	5.82	6.89	1.07
10 YR 1 HR	N-ASE-A03	7.99	7.16	-0.83
10 YR 1 HR	N-ASE-A04	7.99	7.21	-0.78
10 YR 1 HR	N-ASE-A05	11.37	11.37	0
10 YR 1 HR	N-ASE-B02	5.67	6.58	0.91
10 YR 1 HR	N-ASE-C03	6.14	8.05	1.91
10 YR 1 HR	N-ASE-D03	6.79	8.05	1.26
10 YR 1 HR	N-ASF-A01	6.28	6.13	-0.15
10 YR 1 HR	N-ASF-A02	6.28	6.14	-0.14

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Area A Improvement Projects Future Conditions Tailwater Selected Alternative (A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASG-A01	5.69	6.13	0.44
10 YR 1 HR	N-ASG-A02	6.03	6.2	0.17
10 YR 1 HR	N-ASG-A03	6.51	6.22	-0.29
10 YR 1 HR	N-ASG-A04	7.03	6.27	-0.76
10 YR 1 HR	N-ASG-A05	7.03	6.29	-0.74
10 YR 1 HR	N-ASG-A06	7.11	7.11	0
10 YR 1 HR	N-ASG-B02	5.72	6.12	0.4
10 YR 1 HR	N-ASG-B03x	5.72	6.12	0.4
10 YR 1 HR	N-ASG-C04	6.42	6.25	-0.17
10 YR 1 HR	N-ASG-C05	6.4	6.26	-0.14
10 YR 1 HR	N-ASH-A01	5.56	6.12	0.56
10 YR 1 HR	N-ASH-A02	5.65	6.12	0.47
10 YR 1 HR	N-ASI-A01	5.43	5.61	0.18
10 YR 1 HR	N-ASJ	1.59	4.4	2.81
10 YR 1 HR	N-ASJ-A01	5.69	6.11	0.42
10 YR 1 HR	N-ASK-A01	5.42	6.1	0.68

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Area A Improvement Projects Future Conditions Tailwater Selected Alternative (A)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	Added-Junction-1	#N/A	6.97	#N/A
25 YR 72 HR	N-ABA	1.59	4.4	2.81
25 YR 72 HR	N-ABA-A01	4.85	5.23	0.38
25 YR 72 HR	N-ABA-A02	4.85	5.23	0.38
25 YR 72 HR	N-ABB	1.59	4.4	2.81
25 YR 72 HR	N-ABB-A01	4.04	4.97	0.93
25 YR 72 HR	N-ABB-A02	4.87	5.24	0.37
25 YR 72 HR	N-ABB-A03	4.88	5.24	0.36
25 YR 72 HR	N-ABB-A04	4.88	5.24	0.36
25 YR 72 HR	N-ABB-B02	4.87	5.25	0.38
25 YR 72 HR	N-ABB-B03	4.87	5.25	0.38
25 YR 72 HR	N-ABB-B03x	4.87	5.25	0.38
25 YR 72 HR	N-ABB-B04	4.87	5.25	0.38
25 YR 72 HR	N-ABC	1.59	4.4	2.81
25 YR 72 HR	N-ABC-A01	4.89	5.24	0.35
25 YR 72 HR	N-ABC-A02	4.89	5.24	0.35
25 YR 72 HR	N-ABC-B02	4.89	5.24	0.35
25 YR 72 HR	N-ABD	1.59	4.4	2.81
25 YR 72 HR	N-ABD-A01	4.91	5.25	0.34
25 YR 72 HR	N-ABD-A02	4.92	5.25	0.33
25 YR 72 HR	N-ABD-A02x	4.92	5.25	0.33
25 YR 72 HR	N-ABD-A03	5.22	5.46	0.24
25 YR 72 HR	N-ABD-A03x	4.93	5.26	0.33
25 YR 72 HR	N-ABD-A04	5.6	5.51	-0.09
25 YR 72 HR	N-ABD-A05	5.66	5.57	-0.09
25 YR 72 HR	N-ABD-A06	5.28	5.28	0
25 YR 72 HR	N-ABD-A07	5.28	5.28	0
25 YR 72 HR	N-ABD-B04	5.73	5.62	-0.11
25 YR 72 HR	N-ABD-B05	5.74	5.64	-0.1
25 YR 72 HR	N-ABD-B05x	5.72	5.62	-0.1
25 YR 72 HR	N-ABD-B06	5.74	5.64	-0.1
25 YR 72 HR	N-ABD-B07	6.82	6.76	-0.06
25 YR 72 HR	N-ABD-B08	7.49	7.49	0
25 YR 72 HR	N-ABE	1.59	4.4	2.81
25 YR 72 HR	N-ABE-A01	4.89	5.24	0.35
25 YR 72 HR	N-ABE-A02	4.89	5.24	0.35
25 YR 72 HR	N-ABF	1.59	4.4	2.81
25 YR 72 HR	N-ABF-A01	4.88	5.22	0.34
25 YR 72 HR	N-ABF-A02	4.89	5.23	0.34
25 YR 72 HR	N-ABG	1.59	4.4	2.81
25 YR 72 HR	N-ABG-A01	5.04	5.27	0.23
25 YR 72 HR	N-ABG-A02	5.04	5.27	0.23
25 YR 72 HR	N-ABG-A03	5.05	5.27	0.22
25 YR 72 HR	N-ABH	1.59	4.4	2.81

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ABH-A01	4.6	4.98	0.38
25 YR 72 HR	N-ABH-A02	5.53	5.14	-0.39
25 YR 72 HR	N-ABH-A03	5.53	5.15	-0.38
25 YR 72 HR	N-ABH-A03x	5.53	5.16	-0.37
25 YR 72 HR	N-ABH-B02	5.57	5.37	-0.2
25 YR 72 HR	N-ABH-B03	5.58	5.38	-0.2
25 YR 72 HR	N-ABH-B03x	5.59	5.38	-0.21
25 YR 72 HR	N-ABH-B04	5.59	5.39	-0.2
25 YR 72 HR	N-ABI	1.59	4.4	2.81
25 YR 72 HR	N-ABI-A01	5.52	5.1	-0.42
25 YR 72 HR	N-ABI-A02	5.52	5.1	-0.42
25 YR 72 HR	N-ABJ	1.59	4.4	2.81
25 YR 72 HR	N-ABJ-A01	5.52	5.11	-0.41
25 YR 72 HR	N-ABJ-A02	5.52	5.12	-0.4
25 YR 72 HR	N-ABK	1.59	4.4	2.81
25 YR 72 HR	N-ABK-A01	4.39	5.72	1.33
25 YR 72 HR	N-ABK-A02x1	6.85	7.28	0.43
25 YR 72 HR	N-ABK-A02x2	6.86	7.31	0.45
25 YR 72 HR	N-ABK-B02	5.47	5.2	-0.27
25 YR 72 HR	N-ABK-B03	5.47	5.2	-0.27
25 YR 72 HR	N-ABK-B04	7.51	6.96	-0.55
25 YR 72 HR	N-ABL	1.59	4.4	2.81
25 YR 72 HR	N-ABL-A01	5.23	5.1	-0.13
25 YR 72 HR	N-ABL-A02	5.22	5.1	-0.12
25 YR 72 HR	N-ABM	1.59	4.4	2.81
25 YR 72 HR	N-ABM-A01	5.22	5.1	-0.12
25 YR 72 HR	N-ABM-A02	5.22	5.1	-0.12
25 YR 72 HR	N-ABN	1.59	4.4	2.81
25 YR 72 HR	N-ABN-A01	9.84	9.67	-0.17
25 YR 72 HR	N-ABO	1.59	4.4	2.81
25 YR 72 HR	N-ABO-A01	4.42	5.53	1.11
25 YR 72 HR	N-ABO-A02	5.48	6.37	0.89
25 YR 72 HR	N-ABP	1.59	4.4	2.81
25 YR 72 HR	N-ABQ	1.59	4.4	2.81
25 YR 72 HR	N-ADA-A01	6.84	7.12	0.28
25 YR 72 HR	N-ADA-A02	7.42	7.08	-0.34
25 YR 72 HR	N-ADA-A03	7.42	7.08	-0.34
25 YR 72 HR	N-ADA-A03x	7.41	7.08	-0.33
25 YR 72 HR	N-ADA-A04	7.44	7.09	-0.35
25 YR 72 HR	N-ADA-A05	7.44	7.09	-0.35
25 YR 72 HR	N-ADA-B02	7.08	6.92	-0.16
25 YR 72 HR	N-ADA-B03	7.07	6.91	-0.16
25 YR 72 HR	N-ADA-B03x	7.07	6.91	-0.16
25 YR 72 HR	N-ADA-B04	7.24	6.95	-0.29

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ADB-08	7.46	7.12	-0.34
25 YR 72 HR	N-ADB-A01	7.6	7.39	-0.21
25 YR 72 HR	N-ADB-A02	7.61	7.44	-0.17
25 YR 72 HR	N-ADB-A03	8.59	7.65	-0.94
25 YR 72 HR	N-ADB-A04	8.88	7.7	-1.18
25 YR 72 HR	N-ADB-A04x	8.83	7.67	-1.16
25 YR 72 HR	N-ADB-B03	7.62	7.48	-0.14
25 YR 72 HR	N-ADB-B04	8.94	8.71	-0.23
25 YR 72 HR	N-ADB-B05	8.97	8.77	-0.2
25 YR 72 HR	N-ADB-B06	9.25	9.21	-0.04
25 YR 72 HR	N-ADB-B07	9.87	9.71	-0.16
25 YR 72 HR	N-ADB-B07x	9.8	9.65	-0.15
25 YR 72 HR	N-ADC-A01	8.23	7.31	-0.92
25 YR 72 HR	N-ADC-A02	8.23	7.31	-0.92
25 YR 72 HR	N-ADD-A01	8.55	7.96	-0.59
25 YR 72 HR	N-ADD-A02	8.75	8.22	-0.53
25 YR 72 HR	N-ADD-A03	10.99	9.73	-1.26
25 YR 72 HR	N-ADD-A04	10.99	10.1	-0.89
25 YR 72 HR	N-ADD-A04x	10.99	9.73	-1.26
25 YR 72 HR	N-ADD-A05	11.03	10.68	-0.35
25 YR 72 HR	N-ADD-A06	11.04	10.79	-0.25
25 YR 72 HR	N-ADD-A07	12.55	11.55	-1
25 YR 72 HR	N-ADD-A08	12.57	11.88	-0.69
25 YR 72 HR	N-ADD-A09	12.63	12.09	-0.54
25 YR 72 HR	N-ADD-A10	12.63	12.25	-0.38
25 YR 72 HR	N-ADD-A11	12.67	12.49	-0.18
25 YR 72 HR	N-ADD-A12	13.12	12.74	-0.38
25 YR 72 HR	N-ADD-A13	13.39	13.17	-0.22
25 YR 72 HR	N-ADD-A14	13.38	13.18	-0.2
25 YR 72 HR	N-ADD-A15	13.36	13.16	-0.2
25 YR 72 HR	N-ADD-A16	13.26	13.14	-0.12
25 YR 72 HR	N-ADD-B03	8.8	8.28	-0.52
25 YR 72 HR	N-ADD-B05	11.74	11.74	0
25 YR 72 HR	N-ADD-C04	11	10.7	-0.3
25 YR 72 HR	N-ADD-C05	11.27	11.27	0
25 YR 72 HR	N-ADD-D08	12.02	11.67	-0.35
25 YR 72 HR	N-ADD-D09	11.9	11.8	-0.1
25 YR 72 HR	N-ADD-H04	10.99	10.69	-0.3
25 YR 72 HR	N-ADD-N13	12.9	12.75	-0.15
25 YR 72 HR	N-ADD-N14	13.17	12.82	-0.35
25 YR 72 HR	N-ADD-N15	12.56	12.74	0.18
25 YR 72 HR	N-ADE-A01	7.76	7.55	-0.21
25 YR 72 HR	N-ADE-A02	8.62	7.88	-0.74
25 YR 72 HR	N-ADE-A03	8.76	8.18	-0.58

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ADE-A04	9.15	8.88	-0.27
25 YR 72 HR	N-ADE-A04x	8.78	8.19	-0.59
25 YR 72 HR	N-ADE-A05	10.89	10.89	0
25 YR 72 HR	N-ADE-A05x	9.15	8.88	-0.27
25 YR 72 HR	N-ADE-A06	11.25	11.25	0
25 YR 72 HR	N-ADE-B02	7.3	7.26	-0.04
25 YR 72 HR	N-ADE-B03	7.3	7.23	-0.07
25 YR 72 HR	N-ADE-C02	7.77	7.55	-0.22
25 YR 72 HR	N-ADE-C03	7.78	7.55	-0.23
25 YR 72 HR	N-ADE-D03	7.28	7.23	-0.05
25 YR 72 HR	N-ADS-A01	6.41	6.54	0.13
25 YR 72 HR	N-ADS-A02	6.41	6.53	0.12
25 YR 72 HR	N-ASA-A01	5.51	6.14	0.63
25 YR 72 HR	N-ASA-A02	5.51	6.14	0.63
25 YR 72 HR	N-ASA-A03	5.78	6.14	0.36
25 YR 72 HR	N-ASA-A04	5.92	6.14	0.22
25 YR 72 HR	N-ASA-A05	6.09	6.16	0.07
25 YR 72 HR	N-ASA-A06	6.17	6.16	-0.01
25 YR 72 HR	N-ASA-A07	6.19	6.16	-0.03
25 YR 72 HR	N-ASB-A01	5.59	6.17	0.58
25 YR 72 HR	N-ASB-A02	5.59	6.17	0.58
25 YR 72 HR	N-ASB-B02	5.83	6.17	0.34
25 YR 72 HR	N-ASC-A01	5.68	6.63	0.95
25 YR 72 HR	N-ASC-A02	6.83	7.21	0.38
25 YR 72 HR	N-ASC-A03	7.11	7.24	0.13
25 YR 72 HR	N-ASC-A04	7.12	7.24	0.12
25 YR 72 HR	N-ASC-B02	6.17	6.63	0.46
25 YR 72 HR	N-ASC-B03	6.26	6.62	0.36
25 YR 72 HR	N-ASD-A01a	6.3	7.26	0.96
25 YR 72 HR	N-ASD-A02	8.51	9.05	0.54
25 YR 72 HR	N-ASD-A03	9.34	9.73	0.39
25 YR 72 HR	N-ASD-A04	10.42	10.6	0.18
25 YR 72 HR	N-ASD-A05	10.77	10.93	0.16
25 YR 72 HR	N-ASD-A06	11.44	11.56	0.12
25 YR 72 HR	N-ASD-A07	11.89	11.99	0.1
25 YR 72 HR	N-ASD-A08	12.44	12.51	0.07
25 YR 72 HR	N-ASD-A09	13.17	13.2	0.03
25 YR 72 HR	N-ASD-A11	14.09	14.1	0.01
25 YR 72 HR	N-ASD-A12	15.03	15.04	0.01
25 YR 72 HR	N-ASD-A13	15.62	15.62	0
25 YR 72 HR	N-ASD-A14	15.92	15.92	0
25 YR 72 HR	N-ASD-A15	16.41	16.41	0
25 YR 72 HR	N-ASD-A16	14.31	14.31	0
25 YR 72 HR	N-ASD-A17	16.62	16.62	0

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Area A Improvement Projects Future Conditions Tailwater Selected Alternative (A)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASD-A18	15.58	15.58	0
25 YR 72 HR	N-ASD-A19	14.93	14.93	0
25 YR 72 HR	N-ASD-B02	6.43	7.42	0.99
25 YR 72 HR	N-ASD-B03	7.84	8.52	0.68
25 YR 72 HR	N-ASD-B04	8.09	8.62	0.53
25 YR 72 HR	N-ASD-B05	8.8	8.96	0.16
25 YR 72 HR	N-ASD-C03	8.95	9.09	0.14
25 YR 72 HR	N-ASD-C04	7.11	7.53	0.42
25 YR 72 HR	N-ASD-D04	8.96	9.08	0.12
25 YR 72 HR	N-ASD-D05	9	9.1	0.1
25 YR 72 HR	N-ASD-D06	8.77	8.83	0.06
25 YR 72 HR	N-ASD-D07	9.07	9.15	0.08
25 YR 72 HR	N-ASD-E04	9.84	10.17	0.33
25 YR 72 HR	N-ASD-E05	10.78	10.94	0.16
25 YR 72 HR	N-ASD-E06	10.98	11.13	0.15
25 YR 72 HR	N-ASD-E09	14.21	14.22	0.01
25 YR 72 HR	N-ASD-E10	13.9	13.91	0.01
25 YR 72 HR	N-ASD-F03	9	9.3	0.3
25 YR 72 HR	N-ASD-F04	9.28	9.33	0.05
25 YR 72 HR	N-ASD-F05	9.69	9.7	0.01
25 YR 72 HR	N-ASD-G04	9.35	9.74	0.39
25 YR 72 HR	N-ASD-H07	9.55	9.55	0
25 YR 72 HR	N-ASD-H08	9.55	9.55	0
25 YR 72 HR	N-ASD-I09	10.9	10.9	0
25 YR 72 HR	N-ASD-J10	12.54	12.54	0
25 YR 72 HR	N-ASD-K10	13.9	13.91	0.01
25 YR 72 HR	N-ASD-L07	11.3	11.31	0.01
25 YR 72 HR	N-ASD-Q06	10.93	11.09	0.16
25 YR 72 HR	N-ASD-Q08	11.7	11.8	0.1
25 YR 72 HR	N-ASD-Q09	12.78	12.82	0.04
25 YR 72 HR	N-ASD-R13	14.25	14.25	0
25 YR 72 HR	N-ASD-S13	14.85	14.85	0
25 YR 72 HR	N-ASD-T15	16.56	16.56	0
25 YR 72 HR	N-ASD-U06	10.79	10.95	0.16
25 YR 72 HR	N-ASE-A01	6.11	6.98	0.87
25 YR 72 HR	N-ASE-A02	6.38	7.49	1.11
25 YR 72 HR	N-ASE-A03	9.1	8.16	-0.94
25 YR 72 HR	N-ASE-A04	9.11	8.16	-0.95
25 YR 72 HR	N-ASE-A05	11.45	11.45	0
25 YR 72 HR	N-ASE-B02	6.14	6.94	0.8
25 YR 72 HR	N-ASE-C03	7.04	8.16	1.12
25 YR 72 HR	N-ASE-D03	7.87	8.17	0.3
25 YR 72 HR	N-ASF-A01	6.47	6.63	0.16
25 YR 72 HR	N-ASF-A02	6.47	6.64	0.17

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Area A Improvement Projects Future Conditions Tailwater Selected Alternative (A)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASG-A01	5.93	6.38	0.45
25 YR 72 HR	N-ASG-A02	6.27	6.53	0.26
25 YR 72 HR	N-ASG-A03	6.8	6.58	-0.22
25 YR 72 HR	N-ASG-A04	7.46	6.68	-0.78
25 YR 72 HR	N-ASG-A05	7.46	6.71	-0.75
25 YR 72 HR	N-ASG-A06	7.13	7.13	0
25 YR 72 HR	N-ASG-B02	5.94	6.34	0.4
25 YR 72 HR	N-ASG-B03x	5.94	6.35	0.41
25 YR 72 HR	N-ASG-C04	6.54	6.46	-0.08
25 YR 72 HR	N-ASG-C05	6.45	6.43	-0.02
25 YR 72 HR	N-ASH-A01	5.94	6.36	0.42
25 YR 72 HR	N-ASH-A02	5.94	6.35	0.41
25 YR 72 HR	N-ASI-A01	5.47	5.65	0.18
25 YR 72 HR	N-ASJ	1.59	4.4	2.81
25 YR 72 HR	N-ASJ-A01	5.71	6.37	0.66
25 YR 72 HR	N-ASK-A01	5.55	6.36	0.81

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Area A Improvement Projects Future Conditions Tailwater Unselected Alternative (2A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	J-ABK-A02	#N/A	6.12	#N/A
10 YR 1 HR	Junction-1	#N/A	6.4	#N/A
10 YR 1 HR	Junction-2	#N/A	6.55	#N/A
10 YR 1 HR	Junction-3	#N/A	6.41	#N/A
10 YR 1 HR	Junction-4	#N/A	6.57	#N/A
10 YR 1 HR	Junction-5	#N/A	5.44	#N/A
10 YR 1 HR	N-ABA	1.59	4.4	2.81
10 YR 1 HR	N-ABA-A01	3.66	4.46	0.8
10 YR 1 HR	N-ABA-A02	3.83	4.45	0.62
10 YR 1 HR	N-ABB	1.59	4.4	2.81
10 YR 1 HR	N-ABB-A01	3.57	4.73	1.16
10 YR 1 HR	N-ABB-A02	4.23	4.74	0.51
10 YR 1 HR	N-ABB-A03	4.23	4.74	0.51
10 YR 1 HR	N-ABB-A04	4.23	4.74	0.51
10 YR 1 HR	N-ABB-B02	4.25	4.74	0.49
10 YR 1 HR	N-ABB-B03	4.27	4.74	0.47
10 YR 1 HR	N-ABB-B03x	4.28	4.72	0.44
10 YR 1 HR	N-ABB-B04	4.28	4.73	0.45
10 YR 1 HR	N-ABC	1.59	4.4	2.81
10 YR 1 HR	N-ABC-A01	4.21	4.74	0.53
10 YR 1 HR	N-ABC-A02	4.22	4.75	0.53
10 YR 1 HR	N-ABC-B02	4.21	4.74	0.53
10 YR 1 HR	N-ABD	1.59	4.4	2.81
10 YR 1 HR	N-ABD-A01	3.33	4.75	1.42
10 YR 1 HR	N-ABD-A02	4.06	4.75	0.69
10 YR 1 HR	N-ABD-A02x	3.76	4.75	0.99
10 YR 1 HR	N-ABD-A03	4.64	4.83	0.19
10 YR 1 HR	N-ABD-A03x	4.11	4.75	0.64
10 YR 1 HR	N-ABD-A04	4.95	4.85	-0.1
10 YR 1 HR	N-ABD-A05	5.18	4.9	-0.28
10 YR 1 HR	N-ABD-A06	5.19	4.8	-0.39
10 YR 1 HR	N-ABD-A07	5.19	4.8	-0.39
10 YR 1 HR	N-ABD-B04	5.43	5.04	-0.39
10 YR 1 HR	N-ABD-B05	5.52	5.15	-0.37
10 YR 1 HR	N-ABD-B05x	5.43	5.05	-0.38
10 YR 1 HR	N-ABD-B06	5.53	5.17	-0.36
10 YR 1 HR	N-ABD-B07	6.17	5.78	-0.39
10 YR 1 HR	N-ABD-B08	7.41	7.41	0
10 YR 1 HR	N-ABE	1.59	4.4	2.81
10 YR 1 HR	N-ABE-A01	2.05	4.74	2.69
10 YR 1 HR	N-ABE-A02	2.68	4.74	2.06
10 YR 1 HR	N-ABF	1.59	4.4	2.81
10 YR 1 HR	N-ABF-A01	4.11	4.73	0.62
10 YR 1 HR	N-ABF-A02	4.11	4.74	0.63

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ABG	1.59	4.4	2.81
10 YR 1 HR	N-ABG-A01	4.53	4.75	0.22
10 YR 1 HR	N-ABG-A02	4.76	4.76	0
10 YR 1 HR	N-ABG-A03	4.79	4.76	-0.03
10 YR 1 HR	N-ABH	1.59	4.4	2.81
10 YR 1 HR	N-ABH-A01	4.07	4.56	0.49
10 YR 1 HR	N-ABH-A02	4.98	4.7	-0.28
10 YR 1 HR	N-ABH-A03	4.98	4.71	-0.27
10 YR 1 HR	N-ABH-A03x	4.98	4.71	-0.27
10 YR 1 HR	N-ABH-B02	5.02	4.73	-0.29
10 YR 1 HR	N-ABH-B03	5.03	4.77	-0.26
10 YR 1 HR	N-ABH-B03x	5.03	4.74	-0.29
10 YR 1 HR	N-ABH-B04	5.04	4.77	-0.27
10 YR 1 HR	N-ABI	1.59	4.4	2.81
10 YR 1 HR	N-ABI-A01	4.93	4.63	-0.3
10 YR 1 HR	N-ABI-A02	4.93	4.64	-0.29
10 YR 1 HR	N-ABJ	1.59	4.4	2.81
10 YR 1 HR	N-ABJ-A01	4.95	4.67	-0.28
10 YR 1 HR	N-ABJ-A02	4.95	4.67	-0.28
10 YR 1 HR	N-ABK	1.59	4.4	2.81
10 YR 1 HR	N-ABK-A01	3.71	5.03	1.32
10 YR 1 HR	N-ABK-A02x1	5.66	6.36	0.7
10 YR 1 HR	N-ABK-A02x2	5.67	6.36	0.69
10 YR 1 HR	N-ABK-B02	4.99	5.02	0.03
10 YR 1 HR	N-ABK-B03	4.99	5.02	0.03
10 YR 1 HR	N-ABK-B04	7.48	6.36	-1.12
10 YR 1 HR	N-ABL	1.59	4.4	2.81
10 YR 1 HR	N-ABL-A01	3.41	4.86	1.45
10 YR 1 HR	N-ABL-A02	4.33	4.86	0.53
10 YR 1 HR	N-ABM	1.59	4.4	2.81
10 YR 1 HR	N-ABM-A01	4.74	4.85	0.11
10 YR 1 HR	N-ABM-A02	4.74	4.85	0.11
10 YR 1 HR	N-ABN	1.59	4.4	2.81
10 YR 1 HR	N-ABN-A01	9.68	9.51	-0.17
10 YR 1 HR	N-ABO	1.59	4.4	2.81
10 YR 1 HR	N-ABO-A01	3.81	5.12	1.31
10 YR 1 HR	N-ABO-A02	5.2	6.01	0.81
10 YR 1 HR	N-ABP	1.59	4.4	2.81
10 YR 1 HR	N-ABQ	1.59	4.4	2.81
10 YR 1 HR	N-ADA-A01	6.1	6.49	0.39
10 YR 1 HR	N-ADA-A02	6.92	6.62	-0.3
10 YR 1 HR	N-ADA-A03	6.93	6.63	-0.3
10 YR 1 HR	N-ADA-A03x	6.92	6.63	-0.29
10 YR 1 HR	N-ADA-A04	6.94	6.65	-0.29

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Area A Improvement Projects Future Conditions Tailwater Unselected Alternative (2A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADA-A05	6.94	6.65	-0.29
10 YR 1 HR	N-ADA-B02	6.57	6.35	-0.22
10 YR 1 HR	N-ADA-B03	6.57	6.33	-0.24
10 YR 1 HR	N-ADA-B03x	6.57	6.34	-0.23
10 YR 1 HR	N-ADA-B04	7.22	6.37	-0.85
10 YR 1 HR	N-ADB-08	7.07	7.06	-0.01
10 YR 1 HR	N-ADB-A01	7.3	6.42	-0.88
10 YR 1 HR	N-ADB-A02	7.48	6.45	-1.03
10 YR 1 HR	N-ADB-A03	8.47	6.45	-2.02
10 YR 1 HR	N-ADB-A04	8.84	6.46	-2.38
10 YR 1 HR	N-ADB-A04x	8.76	6.46	-2.3
10 YR 1 HR	N-ADB-B03	7.49	6.57	-0.92
10 YR 1 HR	N-ADB-B04	8.83	6.95	-1.88
10 YR 1 HR	N-ADB-B05	8.86	7.82	-1.04
10 YR 1 HR	N-ADB-B06	9.16	9.09	-0.07
10 YR 1 HR	N-ADB-B07	9.7	9.53	-0.17
10 YR 1 HR	N-ADB-B07x	9.66	9.51	-0.15
10 YR 1 HR	N-ADC-A01	7.96	6.36	-1.6
10 YR 1 HR	N-ADC-A02	7.97	6.36	-1.61
10 YR 1 HR	N-ADD-A01	7.8	6.45	-1.35
10 YR 1 HR	N-ADD-A02	7.93	6.62	-1.31
10 YR 1 HR	N-ADD-A03	10.93	7.02	-3.91
10 YR 1 HR	N-ADD-A04	10.93	7.53	-3.4
10 YR 1 HR	N-ADD-A04x	10.93	7.03	-3.9
10 YR 1 HR	N-ADD-A05	10.98	8.36	-2.62
10 YR 1 HR	N-ADD-A06	10.99	8.69	-2.3
10 YR 1 HR	N-ADD-A07	12.51	10.05	-2.46
10 YR 1 HR	N-ADD-A08	12.53	10.61	-1.92
10 YR 1 HR	N-ADD-A09	12.59	11.15	-1.44
10 YR 1 HR	N-ADD-A10	12.59	11.73	-0.86
10 YR 1 HR	N-ADD-A11	12.64	12.11	-0.53
10 YR 1 HR	N-ADD-A12	13.08	12.53	-0.55
10 YR 1 HR	N-ADD-A13	13.36	12.96	-0.4
10 YR 1 HR	N-ADD-A14	13.37	12.98	-0.39
10 YR 1 HR	N-ADD-A15	13.35	12.97	-0.38
10 YR 1 HR	N-ADD-A16	13.25	12.96	-0.29
10 YR 1 HR	N-ADD-B03	7.95	6.66	-1.29
10 YR 1 HR	N-ADD-B05	11.67	11.68	0.01
10 YR 1 HR	N-ADD-C04	10.94	10.66	-0.28
10 YR 1 HR	N-ADD-C05	11.24	11.24	0
10 YR 1 HR	N-ADD-D08	12.01	11.41	-0.6
10 YR 1 HR	N-ADD-D09	11.87	11.6	-0.27
10 YR 1 HR	N-ADD-H04	10.93	10.42	-0.51
10 YR 1 HR	N-ADD-N13	12.88	12.56	-0.32

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Area A Improvement Projects Future Conditions Tailwater Unselected Alternative (2A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADD-N14	13.15	12.68	-0.47
10 YR 1 HR	N-ADD-N15	12.55	12.65	0.1
10 YR 1 HR	N-ADE-A01	6.96	6.65	-0.31
10 YR 1 HR	N-ADE-A02	8.4	7.35	-1.05
10 YR 1 HR	N-ADE-A03	8.68	7.7	-0.98
10 YR 1 HR	N-ADE-A04	9.1	8.8	-0.3
10 YR 1 HR	N-ADE-A04x	8.7	7.71	-0.99
10 YR 1 HR	N-ADE-A05	10.84	10.84	0
10 YR 1 HR	N-ADE-A05x	9.1	8.8	-0.3
10 YR 1 HR	N-ADE-A06	11.2	11.2	0
10 YR 1 HR	N-ADE-B02	7.01	6.68	-0.33
10 YR 1 HR	N-ADE-B03	7.02	6.69	-0.33
10 YR 1 HR	N-ADE-C02	7.52	6.52	-1
10 YR 1 HR	N-ADE-C03	7.54	6.6	-0.94
10 YR 1 HR	N-ADE-D03	7	6.7	-0.3
10 YR 1 HR	N-ADS-A01	5.67	6.29	0.62
10 YR 1 HR	N-ADS-A02	5.99	6.28	0.29
10 YR 1 HR	N-ASA-A01	5.41	5.1	-0.31
10 YR 1 HR	N-ASA-A02	5.41	5.09	-0.32
10 YR 1 HR	N-ASA-A03	5.61	5.11	-0.5
10 YR 1 HR	N-ASA-A04	5.72	5.13	-0.59
10 YR 1 HR	N-ASA-A05	5.89	5.17	-0.72
10 YR 1 HR	N-ASA-A06	6.09	5.21	-0.88
10 YR 1 HR	N-ASA-A07	6.12	5.21	-0.91
10 YR 1 HR	N-ASB-A01	5.55	5.24	-0.31
10 YR 1 HR	N-ASB-A02	5.55	5.2	-0.35
10 YR 1 HR	N-ASB-B02	5.8	5.25	-0.55
10 YR 1 HR	N-ASC-A01	5.32	5.4	0.08
10 YR 1 HR	N-ASC-A02	5.99	6.1	0.11
10 YR 1 HR	N-ASC-A03	6.24	6.14	-0.1
10 YR 1 HR	N-ASC-A04	6.5	6.17	-0.33
10 YR 1 HR	N-ASC-B02	5.61	5.35	-0.26
10 YR 1 HR	N-ASC-B03	5.65	5.38	-0.27
10 YR 1 HR	N-ASD-A01a	5.82	6.93	1.11
10 YR 1 HR	N-ASD-A02	8.07	8.83	0.76
10 YR 1 HR	N-ASD-A03	8.89	9.5	0.61
10 YR 1 HR	N-ASD-A04	9.95	10.37	0.42
10 YR 1 HR	N-ASD-A05	10.3	10.66	0.36
10 YR 1 HR	N-ASD-A06	10.99	11.31	0.32
10 YR 1 HR	N-ASD-A07	11.55	11.78	0.23
10 YR 1 HR	N-ASD-A08	12.21	12.34	0.13
10 YR 1 HR	N-ASD-A09	13.04	13.1	0.06
10 YR 1 HR	N-ASD-A11	14.02	14.03	0.01
10 YR 1 HR	N-ASD-A12	14.91	14.92	0.01

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Area A Improvement Projects Future Conditions Tailwater Unselected Alternative (2A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASD-A13	15.49	15.5	0.01
10 YR 1 HR	N-ASD-A14	15.82	15.83	0.01
10 YR 1 HR	N-ASD-A15	16.4	16.4	0
10 YR 1 HR	N-ASD-A16	14.3	14.3	0
10 YR 1 HR	N-ASD-A17	16.61	16.61	0
10 YR 1 HR	N-ASD-A18	15.58	15.58	0
10 YR 1 HR	N-ASD-A19	14.92	14.92	0
10 YR 1 HR	N-ASD-B02	5.9	6.97	1.07
10 YR 1 HR	N-ASD-B03	7.08	7.5	0.42
10 YR 1 HR	N-ASD-B04	7.52	7.92	0.4
10 YR 1 HR	N-ASD-B05	8.63	8.36	-0.27
10 YR 1 HR	N-ASD-C03	6.06	6.96	0.9
10 YR 1 HR	N-ASD-C04	6.08	6.49	0.41
10 YR 1 HR	N-ASD-D04	7.85	8.09	0.24
10 YR 1 HR	N-ASD-D05	8.43	8.47	0.04
10 YR 1 HR	N-ASD-D06	8.14	8.17	0.03
10 YR 1 HR	N-ASD-D07	8.49	8.51	0.02
10 YR 1 HR	N-ASD-E04	9.39	9.92	0.53
10 YR 1 HR	N-ASD-E05	10.23	10.6	0.37
10 YR 1 HR	N-ASD-E06	10.4	10.75	0.35
10 YR 1 HR	N-ASD-E09	14.14	14.15	0.01
10 YR 1 HR	N-ASD-E10	13.84	13.85	0.01
10 YR 1 HR	N-ASD-F03	8.62	8.9	0.28
10 YR 1 HR	N-ASD-F04	9.24	9.17	-0.07
10 YR 1 HR	N-ASD-F05	9.67	9.58	-0.09
10 YR 1 HR	N-ASD-G04	8.9	9.51	0.61
10 YR 1 HR	N-ASD-H07	9.29	9.29	0
10 YR 1 HR	N-ASD-H08	9.42	9.42	0
10 YR 1 HR	N-ASD-I09	10.85	10.86	0.01
10 YR 1 HR	N-ASD-J10	12.51	12.52	0.01
10 YR 1 HR	N-ASD-K10	13.86	13.87	0.01
10 YR 1 HR	N-ASD-L07	10.46	10.48	0.02
10 YR 1 HR	N-ASD-Q06	10.32	10.67	0.35
10 YR 1 HR	N-ASD-Q08	11.23	11.52	0.29
10 YR 1 HR	N-ASD-Q09	12.64	12.7	0.06
10 YR 1 HR	N-ASD-R13	14.22	14.22	0
10 YR 1 HR	N-ASD-S13	14.84	14.84	0
10 YR 1 HR	N-ASD-T15	16.56	16.56	0
10 YR 1 HR	N-ASD-U06	10.26	10.63	0.37
10 YR 1 HR	N-ASE-A01	5.62	6.57	0.95
10 YR 1 HR	N-ASE-A02	5.82	6.89	1.07
10 YR 1 HR	N-ASE-A03	7.99	7.16	-0.83
10 YR 1 HR	N-ASE-A04	7.99	7.2	-0.79
10 YR 1 HR	N-ASE-A05	11.37	11.37	0

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Area A Improvement Projects Future Conditions Tailwater Unselected Alternative (2A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASE-B02	5.67	6.57	0.9
10 YR 1 HR	N-ASE-C03	6.14	8.05	1.91
10 YR 1 HR	N-ASE-D03	6.79	8.06	1.27
10 YR 1 HR	N-ASF-A01	6.28	6.02	-0.26
10 YR 1 HR	N-ASF-A02	6.28	6.03	-0.25
10 YR 1 HR	N-ASG-A01	5.69	6.04	0.35
10 YR 1 HR	N-ASG-A02	6.03	6.1	0.07
10 YR 1 HR	N-ASG-A03	6.51	6.13	-0.38
10 YR 1 HR	N-ASG-A04	7.03	6.18	-0.85
10 YR 1 HR	N-ASG-A05	7.03	6.19	-0.84
10 YR 1 HR	N-ASG-A06	7.11	7.11	0
10 YR 1 HR	N-ASG-B02	5.72	6.03	0.31
10 YR 1 HR	N-ASG-B03x	5.72	6.03	0.31
10 YR 1 HR	N-ASG-C04	6.42	6.19	-0.23
10 YR 1 HR	N-ASG-C05	6.4	6.21	-0.19
10 YR 1 HR	N-ASH-A01	5.56	6.03	0.47
10 YR 1 HR	N-ASH-A02	5.65	6.03	0.38
10 YR 1 HR	N-ASI-A01	5.43	5.59	0.16
10 YR 1 HR	N-ASJ	1.59	4.4	2.81
10 YR 1 HR	N-ASJ-A01	5.69	6.01	0.32
10 YR 1 HR	N-ASK-A01	5.42	6.01	0.59

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	J-ABK-A02	#N/A	6.72	#N/A
25 YR 72 HR	Junction-1	#N/A	6.84	#N/A
25 YR 72 HR	Junction-2	#N/A	7.03	#N/A
25 YR 72 HR	Junction-3	#N/A	6.83	#N/A
25 YR 72 HR	Junction-4	#N/A	7.01	#N/A
25 YR 72 HR	Junction-5	#N/A	5.94	#N/A
25 YR 72 HR	N-ABA	1.59	4.4	2.81
25 YR 72 HR	N-ABA-A01	4.85	4.99	0.14
25 YR 72 HR	N-ABA-A02	4.85	4.98	0.13
25 YR 72 HR	N-ABB	1.59	4.4	2.81
25 YR 72 HR	N-ABB-A01	4.04	5.17	1.13
25 YR 72 HR	N-ABB-A02	4.87	5.18	0.31
25 YR 72 HR	N-ABB-A03	4.88	5.19	0.31
25 YR 72 HR	N-ABB-A04	4.88	5.19	0.31
25 YR 72 HR	N-ABB-B02	4.87	5.18	0.31
25 YR 72 HR	N-ABB-B03	4.87	5.18	0.31
25 YR 72 HR	N-ABB-B03x	4.87	5.17	0.3
25 YR 72 HR	N-ABB-B04	4.87	5.17	0.3
25 YR 72 HR	N-ABC	1.59	4.4	2.81
25 YR 72 HR	N-ABC-A01	4.89	5.2	0.31
25 YR 72 HR	N-ABC-A02	4.89	5.2	0.31
25 YR 72 HR	N-ABC-B02	4.89	5.2	0.31
25 YR 72 HR	N-ABD	1.59	4.4	2.81
25 YR 72 HR	N-ABD-A01	4.91	5.21	0.3
25 YR 72 HR	N-ABD-A02	4.92	5.21	0.29
25 YR 72 HR	N-ABD-A02x	4.92	5.21	0.29
25 YR 72 HR	N-ABD-A03	5.22	5.31	0.09
25 YR 72 HR	N-ABD-A03x	4.93	5.22	0.29
25 YR 72 HR	N-ABD-A04	5.6	5.37	-0.23
25 YR 72 HR	N-ABD-A05	5.66	5.43	-0.23
25 YR 72 HR	N-ABD-A06	5.28	5.23	-0.05
25 YR 72 HR	N-ABD-A07	5.28	5.24	-0.04
25 YR 72 HR	N-ABD-B04	5.73	5.53	-0.2
25 YR 72 HR	N-ABD-B05	5.74	5.56	-0.18
25 YR 72 HR	N-ABD-B05x	5.72	5.52	-0.2
25 YR 72 HR	N-ABD-B06	5.74	5.56	-0.18
25 YR 72 HR	N-ABD-B07	6.82	6.66	-0.16
25 YR 72 HR	N-ABD-B08	7.49	7.49	0
25 YR 72 HR	N-ABE	1.59	4.4	2.81
25 YR 72 HR	N-ABE-A01	4.89	5.2	0.31
25 YR 72 HR	N-ABE-A02	4.89	5.2	0.31
25 YR 72 HR	N-ABF	1.59	4.4	2.81
25 YR 72 HR	N-ABF-A01	4.88	5.19	0.31
25 YR 72 HR	N-ABF-A02	4.89	5.19	0.3

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ABG	1.59	4.4	2.81
25 YR 72 HR	N-ABG-A01	5.04	5.22	0.18
25 YR 72 HR	N-ABG-A02	5.04	5.23	0.19
25 YR 72 HR	N-ABG-A03	5.05	5.24	0.19
25 YR 72 HR	N-ABH	1.59	4.4	2.81
25 YR 72 HR	N-ABH-A01	4.6	4.84	0.24
25 YR 72 HR	N-ABH-A02	5.53	5.23	-0.3
25 YR 72 HR	N-ABH-A03	5.53	5.23	-0.3
25 YR 72 HR	N-ABH-A03x	5.53	5.24	-0.29
25 YR 72 HR	N-ABH-B02	5.57	5.27	-0.3
25 YR 72 HR	N-ABH-B03	5.58	5.27	-0.31
25 YR 72 HR	N-ABH-B03x	5.59	5.27	-0.32
25 YR 72 HR	N-ABH-B04	5.59	5.28	-0.31
25 YR 72 HR	N-ABI	1.59	4.4	2.81
25 YR 72 HR	N-ABI-A01	5.52	5.19	-0.33
25 YR 72 HR	N-ABI-A02	5.52	5.2	-0.32
25 YR 72 HR	N-ABJ	1.59	4.4	2.81
25 YR 72 HR	N-ABJ-A01	5.52	5.21	-0.31
25 YR 72 HR	N-ABJ-A02	5.52	5.21	-0.31
25 YR 72 HR	N-ABK	1.59	4.4	2.81
25 YR 72 HR	N-ABK-A01	4.39	5.24	0.85
25 YR 72 HR	N-ABK-A02x1	6.85	7.37	0.52
25 YR 72 HR	N-ABK-A02x2	6.86	7.38	0.52
25 YR 72 HR	N-ABK-B02	5.47	5.23	-0.24
25 YR 72 HR	N-ABK-B03	5.47	5.23	-0.24
25 YR 72 HR	N-ABK-B04	7.51	6.87	-0.64
25 YR 72 HR	N-ABL	1.59	4.4	2.81
25 YR 72 HR	N-ABL-A01	5.23	5.07	-0.16
25 YR 72 HR	N-ABL-A02	5.22	5.07	-0.15
25 YR 72 HR	N-ABM	1.59	4.4	2.81
25 YR 72 HR	N-ABM-A01	5.22	5.06	-0.16
25 YR 72 HR	N-ABM-A02	5.22	5.06	-0.16
25 YR 72 HR	N-ABN	1.59	4.4	2.81
25 YR 72 HR	N-ABN-A01	9.84	9.67	-0.17
25 YR 72 HR	N-ABO	1.59	4.4	2.81
25 YR 72 HR	N-ABO-A01	4.42	5.45	1.03
25 YR 72 HR	N-ABO-A02	5.48	6.32	0.84
25 YR 72 HR	N-ABP	1.59	4.4	2.81
25 YR 72 HR	N-ABQ	1.59	4.4	2.81
25 YR 72 HR	N-ADA-A01	6.84	6.83	-0.01
25 YR 72 HR	N-ADA-A02	7.42	6.92	-0.5
25 YR 72 HR	N-ADA-A03	7.42	6.93	-0.49
25 YR 72 HR	N-ADA-A03x	7.41	6.92	-0.49
25 YR 72 HR	N-ADA-A04	7.44	6.95	-0.49

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Area A Improvement Projects Future Conditions Tailwater Unselected Alternative (2A)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ADA-A05	7.44	6.95	-0.49
25 YR 72 HR	N-ADA-B02	7.08	6.73	-0.35
25 YR 72 HR	N-ADA-B03	7.07	6.73	-0.34
25 YR 72 HR	N-ADA-B03x	7.07	6.73	-0.34
25 YR 72 HR	N-ADA-B04	7.24	6.81	-0.43
25 YR 72 HR	N-ADB-08	7.46	7.12	-0.34
25 YR 72 HR	N-ADB-A01	7.6	7.42	-0.18
25 YR 72 HR	N-ADB-A02	7.61	7.45	-0.16
25 YR 72 HR	N-ADB-A03	8.59	7.61	-0.98
25 YR 72 HR	N-ADB-A04	8.88	7.67	-1.21
25 YR 72 HR	N-ADB-A04x	8.83	7.63	-1.2
25 YR 72 HR	N-ADB-B03	7.62	7.49	-0.13
25 YR 72 HR	N-ADB-B04	8.94	8.54	-0.4
25 YR 72 HR	N-ADB-B05	8.97	8.68	-0.29
25 YR 72 HR	N-ADB-B06	9.25	9.21	-0.04
25 YR 72 HR	N-ADB-B07	9.87	9.71	-0.16
25 YR 72 HR	N-ADB-B07x	9.8	9.65	-0.15
25 YR 72 HR	N-ADC-A01	8.23	7.39	-0.84
25 YR 72 HR	N-ADC-A02	8.23	7.39	-0.84
25 YR 72 HR	N-ADD-A01	8.55	7.58	-0.97
25 YR 72 HR	N-ADD-A02	8.75	7.74	-1.01
25 YR 72 HR	N-ADD-A03	10.99	8.13	-2.86
25 YR 72 HR	N-ADD-A04	10.99	8.65	-2.34
25 YR 72 HR	N-ADD-A04x	10.99	8.13	-2.86
25 YR 72 HR	N-ADD-A05	11.03	9.48	-1.55
25 YR 72 HR	N-ADD-A06	11.04	9.81	-1.23
25 YR 72 HR	N-ADD-A07	12.55	11	-1.55
25 YR 72 HR	N-ADD-A08	12.57	11.44	-1.13
25 YR 72 HR	N-ADD-A09	12.63	11.76	-0.87
25 YR 72 HR	N-ADD-A10	12.63	12.06	-0.57
25 YR 72 HR	N-ADD-A11	12.67	12.39	-0.28
25 YR 72 HR	N-ADD-A12	13.12	12.7	-0.42
25 YR 72 HR	N-ADD-A13	13.39	13.15	-0.24
25 YR 72 HR	N-ADD-A14	13.38	13.16	-0.22
25 YR 72 HR	N-ADD-A15	13.36	13.14	-0.22
25 YR 72 HR	N-ADD-A16	13.26	13.12	-0.14
25 YR 72 HR	N-ADD-B03	8.8	7.79	-1.01
25 YR 72 HR	N-ADD-B05	11.74	11.74	0
25 YR 72 HR	N-ADD-C04	11	10.69	-0.31
25 YR 72 HR	N-ADD-C05	11.27	11.27	0
25 YR 72 HR	N-ADD-D08	12.02	11.52	-0.5
25 YR 72 HR	N-ADD-D09	11.9	11.73	-0.17
25 YR 72 HR	N-ADD-H04	10.99	10.66	-0.33
25 YR 72 HR	N-ADD-N13	12.9	12.7	-0.2

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Area A Improvement Projects Future Conditions Tailwater Unselected Alternative (2A)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ADD-N14	13.17	12.79	-0.38
25 YR 72 HR	N-ADD-N15	12.56	12.72	0.16
25 YR 72 HR	N-ADE-A01	7.76	7.4	-0.36
25 YR 72 HR	N-ADE-A02	8.62	8.23	-0.39
25 YR 72 HR	N-ADE-A03	8.76	8.57	-0.19
25 YR 72 HR	N-ADE-A04	9.15	9.04	-0.11
25 YR 72 HR	N-ADE-A04x	8.78	8.59	-0.19
25 YR 72 HR	N-ADE-A05	10.89	10.89	0
25 YR 72 HR	N-ADE-A05x	9.15	9.04	-0.11
25 YR 72 HR	N-ADE-A06	11.25	11.25	0
25 YR 72 HR	N-ADE-B02	7.3	7.22	-0.08
25 YR 72 HR	N-ADE-B03	7.3	7.17	-0.13
25 YR 72 HR	N-ADE-C02	7.77	7.27	-0.5
25 YR 72 HR	N-ADE-C03	7.78	7.44	-0.34
25 YR 72 HR	N-ADE-D03	7.28	7.18	-0.1
25 YR 72 HR	N-ADS-A01	6.41	6.53	0.12
25 YR 72 HR	N-ADS-A02	6.41	6.53	0.12
25 YR 72 HR	N-ASA-A01	5.51	5.56	0.05
25 YR 72 HR	N-ASA-A02	5.51	5.56	0.05
25 YR 72 HR	N-ASA-A03	5.78	5.59	-0.19
25 YR 72 HR	N-ASA-A04	5.92	5.62	-0.3
25 YR 72 HR	N-ASA-A05	6.09	5.68	-0.41
25 YR 72 HR	N-ASA-A06	6.17	5.77	-0.4
25 YR 72 HR	N-ASA-A07	6.19	5.77	-0.42
25 YR 72 HR	N-ASB-A01	5.59	5.69	0.1
25 YR 72 HR	N-ASB-A02	5.59	5.66	0.07
25 YR 72 HR	N-ASB-B02	5.83	5.71	-0.12
25 YR 72 HR	N-ASC-A01	5.68	5.89	0.21
25 YR 72 HR	N-ASC-A02	6.83	6.78	-0.05
25 YR 72 HR	N-ASC-A03	7.11	6.83	-0.28
25 YR 72 HR	N-ASC-A04	7.12	6.86	-0.26
25 YR 72 HR	N-ASC-B02	6.17	5.83	-0.34
25 YR 72 HR	N-ASC-B03	6.26	5.87	-0.39
25 YR 72 HR	N-ASD-A01a	6.3	7.47	1.17
25 YR 72 HR	N-ASD-A02	8.51	9.21	0.7
25 YR 72 HR	N-ASD-A03	9.34	9.84	0.5
25 YR 72 HR	N-ASD-A04	10.42	10.64	0.22
25 YR 72 HR	N-ASD-A05	10.77	10.95	0.18
25 YR 72 HR	N-ASD-A06	11.44	11.58	0.14
25 YR 72 HR	N-ASD-A07	11.89	12.01	0.12
25 YR 72 HR	N-ASD-A08	12.44	12.51	0.07
25 YR 72 HR	N-ASD-A09	13.17	13.2	0.03
25 YR 72 HR	N-ASD-A11	14.09	14.1	0.01
25 YR 72 HR	N-ASD-A12	15.03	15.04	0.01

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASD-A13	15.62	15.62	0
25 YR 72 HR	N-ASD-A14	15.92	15.92	0
25 YR 72 HR	N-ASD-A15	16.41	16.41	0
25 YR 72 HR	N-ASD-A16	14.31	14.31	0
25 YR 72 HR	N-ASD-A17	16.62	16.62	0
25 YR 72 HR	N-ASD-A18	15.58	15.58	0
25 YR 72 HR	N-ASD-A19	14.93	14.93	0
25 YR 72 HR	N-ASD-B02	6.43	7.56	1.13
25 YR 72 HR	N-ASD-B03	7.84	8.16	0.32
25 YR 72 HR	N-ASD-B04	8.09	8.4	0.31
25 YR 72 HR	N-ASD-B05	8.8	8.72	-0.08
25 YR 72 HR	N-ASD-C03	8.95	9.06	0.11
25 YR 72 HR	N-ASD-C04	7.11	7.52	0.41
25 YR 72 HR	N-ASD-D04	8.96	9.05	0.09
25 YR 72 HR	N-ASD-D05	9	9.07	0.07
25 YR 72 HR	N-ASD-D06	8.77	8.79	0.02
25 YR 72 HR	N-ASD-D07	9.07	9.12	0.05
25 YR 72 HR	N-ASD-E04	9.84	10.26	0.42
25 YR 72 HR	N-ASD-E05	10.78	10.97	0.19
25 YR 72 HR	N-ASD-E06	10.98	11.16	0.18
25 YR 72 HR	N-ASD-E09	14.21	14.22	0.01
25 YR 72 HR	N-ASD-E10	13.9	13.91	0.01
25 YR 72 HR	N-ASD-F03	9	9.27	0.27
25 YR 72 HR	N-ASD-F04	9.28	9.3	0.02
25 YR 72 HR	N-ASD-F05	9.69	9.7	0.01
25 YR 72 HR	N-ASD-G04	9.35	9.86	0.51
25 YR 72 HR	N-ASD-H07	9.55	9.55	0
25 YR 72 HR	N-ASD-H08	9.55	9.55	0
25 YR 72 HR	N-ASD-I09	10.9	10.9	0
25 YR 72 HR	N-ASD-J10	12.54	12.54	0
25 YR 72 HR	N-ASD-K10	13.9	13.91	0.01
25 YR 72 HR	N-ASD-L07	11.3	11.32	0.02
25 YR 72 HR	N-ASD-Q06	10.93	11.11	0.18
25 YR 72 HR	N-ASD-Q08	11.7	11.81	0.11
25 YR 72 HR	N-ASD-Q09	12.78	12.82	0.04
25 YR 72 HR	N-ASD-R13	14.25	14.25	0
25 YR 72 HR	N-ASD-S13	14.85	14.85	0
25 YR 72 HR	N-ASD-T15	16.56	16.56	0
25 YR 72 HR	N-ASD-U06	10.79	10.98	0.19
25 YR 72 HR	N-ASE-A01	6.11	7.01	0.9
25 YR 72 HR	N-ASE-A02	6.38	7.51	1.13
25 YR 72 HR	N-ASE-A03	9.1	8.17	-0.93
25 YR 72 HR	N-ASE-A04	9.11	8.17	-0.94
25 YR 72 HR	N-ASE-A05	11.45	11.45	0

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Area A Improvement Projects Future Conditions Tailwater Unselected Alternative (2A)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASE-B02	6.14	6.96	0.82
25 YR 72 HR	N-ASE-C03	7.04	8.16	1.12
25 YR 72 HR	N-ASE-D03	7.87	8.17	0.3
25 YR 72 HR	N-ASF-A01	6.47	6.61	0.14
25 YR 72 HR	N-ASF-A02	6.47	6.62	0.15
25 YR 72 HR	N-ASG-A01	5.93	6.33	0.4
25 YR 72 HR	N-ASG-A02	6.27	6.46	0.19
25 YR 72 HR	N-ASG-A03	6.8	6.5	-0.3
25 YR 72 HR	N-ASG-A04	7.46	6.6	-0.86
25 YR 72 HR	N-ASG-A05	7.46	6.64	-0.82
25 YR 72 HR	N-ASG-A06	7.13	7.13	0
25 YR 72 HR	N-ASG-B02	5.94	6.3	0.36
25 YR 72 HR	N-ASG-B03x	5.94	6.3	0.36
25 YR 72 HR	N-ASG-C04	6.54	6.43	-0.11
25 YR 72 HR	N-ASG-C05	6.45	6.42	-0.03
25 YR 72 HR	N-ASH-A01	5.94	6.31	0.37
25 YR 72 HR	N-ASH-A02	5.94	6.3	0.36
25 YR 72 HR	N-ASI-A01	5.47	5.64	0.17
25 YR 72 HR	N-ASJ	1.59	4.4	2.81
25 YR 72 HR	N-ASJ-A01	5.71	6.32	0.61
25 YR 72 HR	N-ASK-A01	5.55	6.32	0.77

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Area BCDE Improvement Projects Selected Alternative with Future Conditions
Tailwater (2BC,3D,1E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	9thSt-Node	#N/A	4.4	#N/A
10 yr 1 hr	B-Pump Node	#N/A	4.4	#N/A
10 yr 1 hr	B-Pump Node 2	#N/A	4.4	#N/A
10 yr 1 hr	N-BA	1.59	4.4	2.81
10 yr 1 hr	N-BA-A01	3.33	4.4	1.07
10 yr 1 hr	N-BA-A02	3.37	4.41	1.04
10 yr 1 hr	N-BA-A03	3.4	4.42	1.02
10 yr 1 hr	N-BA-A03x	3.37	4.41	1.04
10 yr 1 hr	N-BA-A04	3.46	4.43	0.97
10 yr 1 hr	N-BA-A04x	3.4	4.42	1.02
10 yr 1 hr	N-BA-A05	3.46	4.44	0.98
10 yr 1 hr	N-BA-A06	3.58	4.44	0.86
10 yr 1 hr	N-BA-A07	3.65	4.44	0.79
10 yr 1 hr	N-BA-A07x	3.61	4.45	0.84
10 yr 1 hr	N-BA-A08	3.76	4.45	0.69
10 yr 1 hr	N-BA-A08x	3.65	4.45	0.8
10 yr 1 hr	N-BA-A09	3.91	4.72	0.81
10 yr 1 hr	N-BA-B02	3.26	4.4	1.14
10 yr 1 hr	N-BA-B03	3.26	4.4	1.14
10 yr 1 hr	N-BA-B04	3.25	4.4	1.15
10 yr 1 hr	N-BA-C03	3.33	4.41	1.08
10 yr 1 hr	N-BA-C04	3.32	4.41	1.09
10 yr 1 hr	N-BA-D05	3.48	4.44	0.96
10 yr 1 hr	N-BA-D06	3.49	4.44	0.95
10 yr 1 hr	N-BA-D07	3.65	4.45	0.8
10 yr 1 hr	N-BA-D08	3.72	4.45	0.73
10 yr 1 hr	N-BA-E09	3.76	4.45	0.69
10 yr 1 hr	N-BA-F09	3.87	4.44	0.57
10 yr 1 hr	N-BA-K04	3.39	4.43	1.04
10 yr 1 hr	N-BA-K05	3.41	4.44	1.03
10 yr 1 hr	N-BA-K06	3.6	4.44	0.84
10 yr 1 hr	N-BA-K08	5.06	5.09	0.03
10 yr 1 hr	N-BA-L06	3.54	4.44	0.9
10 yr 1 hr	N-BA-Q05	3.38	4.42	1.04
10 yr 1 hr	N-BA-Q06	3.38	4.42	1.04
10 yr 1 hr	N-BA-Q06x	3.38	4.42	1.04
10 yr 1 hr	N-BA-Q07	3.38	4.42	1.04
10 yr 1 hr	N-BA-Q07x	3.37	4.42	1.05
10 yr 1 hr	N-BA-Q08	3.39	4.43	1.04
10 yr 1 hr	N-BA-R06	3.39	4.43	1.04
10 yr 1 hr	N-BA-R07	3.38	4.43	1.05
10 yr 1 hr	N-BA-R07x	3.4	4.43	1.03
10 yr 1 hr	N-BA-R08	3.38	4.42	1.04
10 yr 1 hr	N-BA-R08x	3.39	4.43	1.04

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA-R09	3.38	4.43	1.05
10 yr 1 hr	N-BA-R10	3.38	4.42	1.04
10 yr 1 hr	N-BA-R11	3.37	4.42	1.05
10 yr 1 hr	N-BA-S06a	3.68	4.47	0.79
10 yr 1 hr	N-BA-T07	3.69	4.44	0.75
10 yr 1 hr	N-BA-T08	3.68	4.44	0.76
10 yr 1 hr	N-BA-T08x	3.69	4.44	0.75
10 yr 1 hr	N-BA-T09	3.4	4.43	1.03
10 yr 1 hr	N-BA-T09x	3.68	4.43	0.75
10 yr 1 hr	N-BA-T10	3.4	4.43	1.03
10 yr 1 hr	N-BA-U02	3.32	4.41	1.09
10 yr 1 hr	N-BA-U03	3.33	4.41	1.08
10 yr 1 hr	N-BA-V07	3.75	4.44	0.69
10 yr 1 hr	N-BA-W08	4.19	4.59	0.4
10 yr 1 hr	N-BA-W09A	4.2	4.6	0.4
10 yr 1 hr	N-BA-W09B	4.17	4.56	0.39
10 yr 1 hr	N-BB	1.59	4.4	2.81
10 yr 1 hr	N-BB-A01	3.32	4.41	1.09
10 yr 1 hr	N-BB-A02	3.33	4.42	1.09
10 yr 1 hr	N-BB-A03	3.31	4.41	1.1
10 yr 1 hr	N-BB-A04	3.32	4.41	1.09
10 yr 1 hr	N-BC	1.59	4.4	2.81
10 yr 1 hr	N-BC-A01	2.39	4.41	2.02
10 yr 1 hr	N-BC-A02	4.78	4.74	-0.04
10 yr 1 hr	N-BD	1.59	4.4	2.81
10 yr 1 hr	N-BD-A01	3.33	4.4	1.07
10 yr 1 hr	N-BD-A02	3.36	4.41	1.05
10 yr 1 hr	N-BD-A02x	3.37	4.41	1.04
10 yr 1 hr	N-BD-A03	3.37	4.41	1.04
10 yr 1 hr	N-BD-A05	3.37	4.41	1.04
10 yr 1 hr	N-BD-B02	3.33	4.4	1.07
10 yr 1 hr	N-BD-B03	3.32	4.4	1.08
10 yr 1 hr	N-BD-B04	3.32	4.4	1.08
10 yr 1 hr	N-BD-B04x	3.32	4.4	1.08
10 yr 1 hr	N-BE	1.59	4.4	2.81
10 yr 1 hr	N-BE-A01	3.31	4.41	1.1
10 yr 1 hr	N-BE-A03	3.39	4.43	1.04
10 yr 1 hr	N-BE-A04	3.4	4.43	1.03
10 yr 1 hr	N-BF	1.59	4.4	2.81
10 yr 1 hr	N-BF-A01	3.9	4.48	0.58
10 yr 1 hr	N-BG	#N/A	4.4	#N/A
10 yr 1 hr	N-CA	1.59	4.4	2.81
10 yr 1 hr	N-CA-A01c	5.81	5.05	-0.76
10 yr 1 hr	N-CA-A01d	3.23	4.4	1.17

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-A02	3.35	4.4	1.05
10 yr 1 hr	N-CA-A03	3.37	4.41	1.04
10 yr 1 hr	N-CA-A04	3.4	4.41	1.01
10 yr 1 hr	N-CA-A05	3.41	4.42	1.01
10 yr 1 hr	N-CA-A07	4.72	4.91	0.19
10 yr 1 hr	N-CA-B03	3.36	4.41	1.05
10 yr 1 hr	N-CA-B04	3.38	4.42	1.04
10 yr 1 hr	N-CA-B07	4.35	4.84	0.49
10 yr 1 hr	N-CA-C03	3.13	4.4	1.27
10 yr 1 hr	N-CA-C04	3.11	4.4	1.29
10 yr 1 hr	N-CA-C05	3.14	4.4	1.26
10 yr 1 hr	N-CA-D06	3.62	4.42	0.8
10 yr 1 hr	N-CA-D07	3.62	4.42	0.8
10 yr 1 hr	N-CA-D07x	3.79	4.42	0.63
10 yr 1 hr	N-CA-D08	3.13	4.42	1.29
10 yr 1 hr	N-CA-D08x	3.64	4.43	0.79
10 yr 1 hr	N-CA-D09x	3.13	4.43	1.3
10 yr 1 hr	N-CA-E07	4.42	4.88	0.46
10 yr 1 hr	N-CA-E08	4.43	4.9	0.47
10 yr 1 hr	N-CA-E09x	4.57	4.9	0.33
10 yr 1 hr	N-CA-F04	3.37	4.41	1.04
10 yr 1 hr	N-CA-F05	3.09	4.41	1.32
10 yr 1 hr	N-CA-F05x	3.19	4.41	1.22
10 yr 1 hr	N-CA-F06	3.08	4.41	1.33
10 yr 1 hr	N-CA-F06x	3.07	4.41	1.34
10 yr 1 hr	N-CA-F07	3.08	4.41	1.33
10 yr 1 hr	N-CA-F07x	3.07	4.4	1.33
10 yr 1 hr	N-CA-F08	3.09	4.41	1.32
10 yr 1 hr	N-CA-F09	3.09	4.41	1.32
10 yr 1 hr	N-CA-F09x	3.09	4.41	1.32
10 yr 1 hr	N-CA-F10	3.1	4.41	1.31
10 yr 1 hr	N-CA-F11	3.1	4.41	1.31
10 yr 1 hr	N-CA-F11x	3.09	4.41	1.32
10 yr 1 hr	N-CA-F12	3.1	4.41	1.31
10 yr 1 hr	N-CA-F12x	3.1	4.41	1.31
10 yr 1 hr	N-CA-G08	3.1	4.42	1.32
10 yr 1 hr	N-CA-G09	3.1	4.42	1.32
10 yr 1 hr	N-CA-G10	3.39	4.42	1.03
10 yr 1 hr	N-CA-G11x	3.37	4.42	1.05
10 yr 1 hr	N-CA-H09	3.1	4.42	1.32
10 yr 1 hr	N-CA-H10	3.1	4.42	1.32
10 yr 1 hr	N-CA-H10x	3.1	4.42	1.32
10 yr 1 hr	N-CA-H11	3.12	4.42	1.3
10 yr 1 hr	N-CA-H11x	3.1	4.42	1.32

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-H12	3.12	4.42	1.3
10 yr 1 hr	N-CA-H13	3.24	4.43	1.19
10 yr 1 hr	N-CA-H14	3.32	4.43	1.11
10 yr 1 hr	N-CA-I12	3.12	4.42	1.3
10 yr 1 hr	N-CA-I13	3.12	4.42	1.3
10 yr 1 hr	N-CA-I14	3.12	4.42	1.3
10 yr 1 hr	N-CA-J14	3.26	4.43	1.17
10 yr 1 hr	N-CA-J15x	3.3	4.43	1.13
10 yr 1 hr	N-CA-K03	3.36	4.41	1.05
10 yr 1 hr	N-CA-L04	3.38	4.41	1.03
10 yr 1 hr	N-CA-L05	3.52	4.43	0.91
10 yr 1 hr	N-CA-M06	3.55	4.43	0.88
10 yr 1 hr	N-CA-N05	3.57	4.42	0.85
10 yr 1 hr	N-CA-O08	4.93	4.92	-0.01
10 yr 1 hr	N-CA-S05	3.23	4.41	1.18
10 yr 1 hr	N-CA-T08	3.06	4.41	1.35
10 yr 1 hr	N-CA-T09	3.06	4.41	1.35
10 yr 1 hr	N-CB	1.59	4.4	2.81
10 yr 1 hr	N-CB-A01	3	4.4	1.4
10 yr 1 hr	N-CB-A02	#N/A	4.4	#N/A
10 yr 1 hr	N-CB-Added	#N/A	4.4	#N/A
10 yr 1 hr	N-CC	1.59	4.4	2.81
10 yr 1 hr	N-CC-A01	2.81	4.4	1.59
10 yr 1 hr	N-CC-A02	2.84	4.4	1.56
10 yr 1 hr	N-CC-A03	3.06	4.4	1.34
10 yr 1 hr	N-CE	1.59	4.4	2.81
10 yr 1 hr	N-CE-A01	3.1	4.41	1.31
10 yr 1 hr	N-CE-A02	3.1	4.42	1.32
10 yr 1 hr	N-CE-A03	3.1	4.42	1.32
10 yr 1 hr	N-CF	1.59	4.4	2.81
10 yr 1 hr	N-CF-A01	3.12	4.42	1.3
10 yr 1 hr	N-CF-A02	3.12	4.42	1.3
10 yr 1 hr	N-CF-A03x	3.12	4.42	1.3
10 yr 1 hr	N-CG	1.59	4.4	2.81
10 yr 1 hr	N-CG-A01	3.12	4.41	1.29
10 yr 1 hr	N-CG-A02x	3.12	4.42	1.3
10 yr 1 hr	N-CG-A03x	3.26	4.42	1.16
10 yr 1 hr	N-CH	1.59	4.4	2.81
10 yr 1 hr	N-CH-A01b	1.81	4.4	2.59
10 yr 1 hr	N-CH-A02	2.23	4.4	2.17
10 yr 1 hr	N-CH-A03	3.64	4.41	0.77
10 yr 1 hr	N-CH-A04	3.76	4.42	0.66
10 yr 1 hr	N-CH-Added	#N/A	4.4	#N/A
10 yr 1 hr	N-CH-B02	2.87	4.4	1.53

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CH-B03	3.84	4.43	0.59
10 yr 1 hr	N-CH-B03x	2.89	4.4	1.51
10 yr 1 hr	N-CH-B04	3.91	4.44	0.53
10 yr 1 hr	N-CH-B04x	4.04	4.46	0.42
10 yr 1 hr	N-CH-B05	4.72	4.63	-0.09
10 yr 1 hr	N-CH-B05x	3.99	4.46	0.47
10 yr 1 hr	N-CH-B06	4.88	4.87	-0.01
10 yr 1 hr	N-CH-B06x	4.82	4.81	-0.01
10 yr 1 hr	N-CH-B07	5.89	5.89	0
10 yr 1 hr	N-CH-C04	3.75	4.42	0.67
10 yr 1 hr	N-CH-C05	3.77	4.43	0.66
10 yr 1 hr	N-CH-C05x1	3.77	4.42	0.65
10 yr 1 hr	N-CH-C05x2	3.77	4.42	0.65
10 yr 1 hr	N-CH-C05x3	3.77	4.42	0.65
10 yr 1 hr	N-CH-C06	3.78	4.43	0.65
10 yr 1 hr	N-CH-C06x	3.77	4.43	0.66
10 yr 1 hr	N-CH-C07x	3.77	4.43	0.66
10 yr 1 hr	N-CH-D05	3.77	4.42	0.65
10 yr 1 hr	N-CH-D06	3.77	4.42	0.65
10 yr 1 hr	N-CH-D08x	3.77	4.42	0.65
10 yr 1 hr	N-CH-E06	3.78	4.43	0.65
10 yr 1 hr	N-CH-E07	3.78	4.43	0.65
10 yr 1 hr	N-CH-F07	3.78	4.43	0.65
10 yr 1 hr	N-CH-F08	3.78	4.43	0.65
10 yr 1 hr	N-CH-G07	3.77	4.42	0.65
10 yr 1 hr	N-CH-G08	3.77	4.41	0.64
10 yr 1 hr	N-CH-G09	3.77	4.41	0.64
10 yr 1 hr	N-CH-G10	3.77	4.41	0.64
10 yr 1 hr	N-CH-G11	3.77	4.41	0.64
10 yr 1 hr	N-CH-I04	3.73	4.41	0.68
10 yr 1 hr	N-CH-I05x1	3.76	4.41	0.65
10 yr 1 hr	N-CH-I05x2	3.76	4.41	0.65
10 yr 1 hr	N-CH-I05x3	3.76	4.41	0.65
10 yr 1 hr	N-CH-I05x4	3.76	4.41	0.65
10 yr 1 hr	N-CI	1.59	4.4	2.81
10 yr 1 hr	N-D10	3.77	4.42	0.65
10 yr 1 hr	N-D16	2.53	4.4	1.87
10 yr 1 hr	N-D19	4.78	4.7	-0.08
10 yr 1 hr	N-D20	4.77	4.67	-0.1
10 yr 1 hr	N-D22	4.79	4.84	0.05
10 yr 1 hr	N-D30	4.76	4.65	-0.11
10 yr 1 hr	N-DA	1.59	4.4	2.81
10 yr 1 hr	N-DA-A01	3.36	4.42	1.06
10 yr 1 hr	N-DB	1.59	4.4	2.81

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DC	1.59	4.4	2.81
10 yr 1 hr	N-DI-A01	3.51	4.42	0.91
10 yr 1 hr	N-DI-A02	3.52	4.43	0.91
10 yr 1 hr	N-DI-B04	4.27	4.46	0.19
10 yr 1 hr	N-DI-B05	4.03	4.46	0.43
10 yr 1 hr	N-DI-B05x	4.71	4.56	-0.15
10 yr 1 hr	N-DI-B06	4.04	4.46	0.42
10 yr 1 hr	N-DI-B07	4.72	4.53	-0.19
10 yr 1 hr	N-DI-B08	4.72	4.56	-0.16
10 yr 1 hr	N-DI-B09	4.73	4.59	-0.14
10 yr 1 hr	N-DI-B10	4.75	4.64	-0.11
10 yr 1 hr	N-DI-B10x	4.73	4.59	-0.14
10 yr 1 hr	N-DI-B11	4.74	4.63	-0.11
10 yr 1 hr	N-DI-C03	3.55	4.45	0.9
10 yr 1 hr	N-DI-C04	4.78	4.84	0.06
10 yr 1 hr	N-DI-C05	4.52	4.52	0
10 yr 1 hr	N-DP	4.17	4.4	0.23
10 yr 1 hr	N-DP-A01	4.32	4.4	0.08
10 yr 1 hr	N-DP-A02	4.36	4.44	0.08
10 yr 1 hr	N-DP-A04	4.39	4.45	0.06
10 yr 1 hr	N-DP-A07	4.77	4.67	-0.1
10 yr 1 hr	N-DP-A08	4.77	4.67	-0.1
10 yr 1 hr	N-DP-A09	4.77	4.66	-0.11
10 yr 1 hr	N-DP-A09x	4.77	4.67	-0.1
10 yr 1 hr	N-DP-A10	4.76	4.65	-0.11
10 yr 1 hr	N-DP-A11x	4.76	4.66	-0.1
10 yr 1 hr	N-DP-B2	4.35	4.43	0.08
10 yr 1 hr	N-DP-C02	4.37	4.4	0.03
10 yr 1 hr	N-DP-C03	3.36	4.42	1.06
10 yr 1 hr	N-DP-C03x	4.37	4.4	0.03
10 yr 1 hr	N-DP-D02	4.43	4.43	0
10 yr 1 hr	N-DP-D03x	4.82	4.85	0.03
10 yr 1 hr	N-DP-D04	4.59	4.58	-0.01
10 yr 1 hr	N-DP-D05x	4.64	4.65	0.01
10 yr 1 hr	N-DP-D06x	4.71	4.77	0.06
10 yr 1 hr	N-DP-D07x	4.81	4.83	0.02
10 yr 1 hr	N-DP-D08x	4.89	4.87	-0.02
10 yr 1 hr	N-DP-D09	5.01	4.95	-0.06
10 yr 1 hr	N-DP-D10	5.4	5.42	0.02
10 yr 1 hr	N-DP-E05	4.74	4.64	-0.1
10 yr 1 hr	N-DP-E06	4.86	4.86	0
10 yr 1 hr	N-DP-E08	4.78	4.7	-0.08
10 yr 1 hr	N-DP-F07	5.1	5.4	0.3
10 yr 1 hr	N-DP-F08	4.94	4.88	-0.06

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DP-F09	4.96	5.03	0.07
10 yr 1 hr	N-DP-G05	4.36	4.45	0.09
10 yr 1 hr	N-DP-G06	4.36	4.46	0.1
10 yr 1 hr	N-DP-G07	4.36	4.48	0.12
10 yr 1 hr	N-DP-G07x	4.35	4.46	0.11
10 yr 1 hr	N-DP-G08	4.39	4.65	0.26
10 yr 1 hr	N-DP-G08x	4.36	4.49	0.13
10 yr 1 hr	N-DP-H04	4.36	4.44	0.08
10 yr 1 hr	N-DP-H05	4.36	4.44	0.08
10 yr 1 hr	N-DP-H05x	4.36	4.44	0.08
10 yr 1 hr	N-DP-H06	4.35	4.45	0.1
10 yr 1 hr	N-DP-H06x	4.36	4.45	0.09
10 yr 1 hr	N-DP-K07	4.36	4.45	0.09
10 yr 1 hr	N-DP-M10	5.11	5.02	-0.09
10 yr 1 hr	N-DP-M11	5.2	5.01	-0.19
10 yr 1 hr	N-DP-M12	5.25	5.21	-0.04
10 yr 1 hr	N-DP-N10	4.89	4.89	0
10 yr 1 hr	N-DP-O10	4.77	4.67	-0.1
10 yr 1 hr	N-DP-O11	4.88	4.76	-0.12
10 yr 1 hr	N-DP-P06	4.6	4.65	0.05
10 yr 1 hr	N-DP-Y03	5.11	5.12	0.01
10 yr 1 hr	N-DP-Z12	4.26	4.5	0.24
10 yr 1 hr	N-DQ-A01	4.33	4.45	0.12
10 yr 1 hr	N-DQ-A01x	#N/A	4.45	#N/A
10 yr 1 hr	N-DQ-A02	4.34	4.45	0.11
10 yr 1 hr	N-DQ-A03	4.33	4.44	0.11
10 yr 1 hr	N-DQ-A03x	2.94	4.41	1.47
10 yr 1 hr	N-DQ-A04	5.32	5.6	0.28
10 yr 1 hr	N-DQ-A05	4.03	4.42	0.39
10 yr 1 hr	N-DQ-A06	4.33	4.45	0.12
10 yr 1 hr	N-DQ-A07	4.33	4.44	0.11
10 yr 1 hr	N-DQ-A08	4.33	4.45	0.12
10 yr 1 hr	N-E01	2.9	4.4	1.5
10 yr 1 hr	N-E02	3.35	4.4	1.05
10 yr 1 hr	N-E03	4	4.4	0.4
10 yr 1 hr	N-E07	4.49	4.53	0.04
10 yr 1 hr	N-E08	3.78	4.4	0.62
10 yr 1 hr	N-E10	3.71	4.4	0.69
10 yr 1 hr	N-E11	1.83	4.4	2.57
10 yr 1 hr	N-EA	1.59	4.4	2.81
10 yr 1 hr	N-EA-A01	3.81	4.41	0.6
10 yr 1 hr	N-EA-A02	3.81	4.41	0.6
10 yr 1 hr	N-EB	1.59	4.4	2.81
10 yr 1 hr	N-EB-A01	2.52	4.4	1.88

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Area BCDE Improvement Projects Selected Alternative with Future Conditions Tailwater (2BC,3D,1E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-EC	1.59	4.4	2.81
10 yr 1 hr	N-EC-A01	2.69	4.4	1.71
10 yr 1 hr	N-ED	1.59	4.4	2.81
10 yr 1 hr	N-ED-A01	3.24	4.41	1.17
10 yr 1 hr	N-ED-A02	3.41	4.4	0.99
10 yr 1 hr	N-ED-A03	3.51	4.4	0.89
10 yr 1 hr	N-EE	1.59	4.4	2.81
10 yr 1 hr	N-EE-A01	3.66	4.4	0.74
10 yr 1 hr	N-EF	1.59	4.4	2.81
10 yr 1 hr	N-EF-A01	3.11	4.4	1.29
10 yr 1 hr	N-EG	1.59	4.4	2.81
10 yr 1 hr	N-EG-A01	3.43	4.4	0.97
10 yr 1 hr	N-EG-A02	3.62	4.4	0.78
10 yr 1 hr	N-EH	1.59	4.4	2.81
10 yr 1 hr	N-EH-A01	1.77	4.4	2.63
10 yr 1 hr	N-EI	1.59	4.4	2.81
10 yr 1 hr	N-EJ	1.59	4.4	2.81
10 yr 1 hr	N-EJ-A01	1.61	4.4	2.79
10 yr 1 hr	N-EK	1.59	4.4	2.81
10 yr 1 hr	N-EK-A01	3.68	4.4	0.72
10 yr 1 hr	N-EL	1.59	4.4	2.81
10 yr 1 hr	N-EL-A01	3.01	4.4	1.39
10 yr 1 hr	N-EM	1.59	4.4	2.81
10 yr 1 hr	N-EM-A01	2.63	4.4	1.77
10 yr 1 hr	N-EM-A02	2.61	4.4	1.79
10 yr 1 hr	N-EM-A03	2	4.4	2.4
10 yr 1 hr	N-EN	1.59	4.4	2.81
10 yr 1 hr	N-EN-A01	2.83	4.4	1.57
10 yr 1 hr	N-EO	1.59	4.4	2.81
10 yr 1 hr	N-EO-A01	2.22	4.4	2.18
10 yr 1 hr	N-EP	1.59	4.4	2.81
10 yr 1 hr	N-EP-A01	1.98	4.4	2.42
10 yr 1 hr	N-EQ	1.59	4.4	2.81
10 yr 1 hr	N-EQ-A01	1.65	4.41	2.76
10 yr 1 hr	N-ER	1.59	4.4	2.81
10 yr 1 hr	N-ES	1.59	4.4	2.81
10 yr 1 hr	N-ET	1.59	4.4	2.81
10 yr 1 hr	N-ET-A01	1.59	4.4	2.81
10 yr 1 hr	N-Pump-C3	#N/A	4.4	#N/A
10 yr 1 hr	Trunkline-Junction-1	#N/A	4.4	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	9thSt-Node	#N/A	4.4	#N/A
25 yr 72 hr	B-Pump Node	#N/A	4.4	#N/A
25 yr 72 hr	B-Pump Node 2	#N/A	4.4	#N/A
25 yr 72 hr	N-BA	1.59	4.4	2.81
25 yr 72 hr	N-BA-A01	3.55	4.4	0.85
25 yr 72 hr	N-BA-A02	3.6	4.42	0.82
25 yr 72 hr	N-BA-A03	3.64	4.43	0.79
25 yr 72 hr	N-BA-A03x	3.6	4.43	0.83
25 yr 72 hr	N-BA-A04	3.71	4.45	0.74
25 yr 72 hr	N-BA-A04x	3.63	4.44	0.81
25 yr 72 hr	N-BA-A05	3.72	4.45	0.73
25 yr 72 hr	N-BA-A06	3.78	4.46	0.68
25 yr 72 hr	N-BA-A07	3.82	4.47	0.65
25 yr 72 hr	N-BA-A07x	3.81	4.47	0.66
25 yr 72 hr	N-BA-A08	3.83	4.47	0.64
25 yr 72 hr	N-BA-A08x	3.82	4.47	0.65
25 yr 72 hr	N-BA-A09	4.01	4.74	0.73
25 yr 72 hr	N-BA-B02	3.41	4.4	0.99
25 yr 72 hr	N-BA-B03	3.41	4.41	1
25 yr 72 hr	N-BA-B04	3.39	4.4	1.01
25 yr 72 hr	N-BA-C03	3.57	4.42	0.85
25 yr 72 hr	N-BA-C04	3.57	4.42	0.85
25 yr 72 hr	N-BA-D05	3.73	4.45	0.72
25 yr 72 hr	N-BA-D06	3.75	4.46	0.71
25 yr 72 hr	N-BA-D07	3.85	4.48	0.63
25 yr 72 hr	N-BA-D08	3.89	4.47	0.58
25 yr 72 hr	N-BA-E09	3.83	4.47	0.64
25 yr 72 hr	N-BA-F09	3.88	4.46	0.58
25 yr 72 hr	N-BA-K04	3.69	4.44	0.75
25 yr 72 hr	N-BA-K05	3.72	4.45	0.73
25 yr 72 hr	N-BA-K06	3.78	4.46	0.68
25 yr 72 hr	N-BA-K08	5.08	5.1	0.02
25 yr 72 hr	N-BA-L06	3.76	4.45	0.69
25 yr 72 hr	N-BA-Q05	3.67	4.44	0.77
25 yr 72 hr	N-BA-Q06	3.66	4.43	0.77
25 yr 72 hr	N-BA-Q06x	3.67	4.43	0.76
25 yr 72 hr	N-BA-Q07	3.68	4.44	0.76
25 yr 72 hr	N-BA-Q07x	3.66	4.43	0.77
25 yr 72 hr	N-BA-Q08	3.68	4.44	0.76
25 yr 72 hr	N-BA-R06	3.69	4.45	0.76
25 yr 72 hr	N-BA-R07	3.68	4.44	0.76
25 yr 72 hr	N-BA-R07x	3.7	4.45	0.75
25 yr 72 hr	N-BA-R08	3.66	4.44	0.78
25 yr 72 hr	N-BA-R08x	3.68	4.44	0.76

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA-R09	3.67	4.44	0.77
25 yr 72 hr	N-BA-R10	3.67	4.44	0.77
25 yr 72 hr	N-BA-R11	3.65	4.43	0.78
25 yr 72 hr	N-BA-S06a	3.94	4.5	0.56
25 yr 72 hr	N-BA-T07	3.73	4.46	0.73
25 yr 72 hr	N-BA-T08	3.72	4.45	0.73
25 yr 72 hr	N-BA-T08x	3.73	4.45	0.72
25 yr 72 hr	N-BA-T09	3.69	4.45	0.76
25 yr 72 hr	N-BA-T09x	3.71	4.45	0.74
25 yr 72 hr	N-BA-T10	3.69	4.45	0.76
25 yr 72 hr	N-BA-U02	3.55	4.41	0.86
25 yr 72 hr	N-BA-U03	3.56	4.42	0.86
25 yr 72 hr	N-BA-V07	3.8	4.45	0.65
25 yr 72 hr	N-BA-W08	4.54	4.65	0.11
25 yr 72 hr	N-BA-W09A	4.55	4.66	0.11
25 yr 72 hr	N-BA-W09B	4.51	4.62	0.11
25 yr 72 hr	N-BB	1.59	4.4	2.81
25 yr 72 hr	N-BB-A01	3.6	4.42	0.82
25 yr 72 hr	N-BB-A02	3.59	4.42	0.83
25 yr 72 hr	N-BB-A03	3.57	4.42	0.85
25 yr 72 hr	N-BB-A04	3.58	4.42	0.84
25 yr 72 hr	N-BC	1.59	4.4	2.81
25 yr 72 hr	N-BC-A01	2.54	4.41	1.87
25 yr 72 hr	N-BC-A02	4.82	4.77	-0.05
25 yr 72 hr	N-BD	1.59	4.4	2.81
25 yr 72 hr	N-BD-A01	3.59	4.4	0.81
25 yr 72 hr	N-BD-A02	3.64	4.42	0.78
25 yr 72 hr	N-BD-A02x	3.65	4.42	0.77
25 yr 72 hr	N-BD-A03	3.65	4.43	0.78
25 yr 72 hr	N-BD-A05	3.64	4.43	0.79
25 yr 72 hr	N-BD-B02	3.59	4.4	0.81
25 yr 72 hr	N-BD-B03	3.57	4.4	0.83
25 yr 72 hr	N-BD-B04	3.64	4.4	0.76
25 yr 72 hr	N-BD-B04x	3.57	4.4	0.83
25 yr 72 hr	N-BE	1.59	4.4	2.81
25 yr 72 hr	N-BE-A01	3.56	4.41	0.85
25 yr 72 hr	N-BE-A03	3.68	4.44	0.76
25 yr 72 hr	N-BE-A04	3.68	4.45	0.77
25 yr 72 hr	N-BF	1.59	4.4	2.81
25 yr 72 hr	N-BF-A01	4.06	4.51	0.45
25 yr 72 hr	N-BG	#N/A	4.4	#N/A
25 yr 72 hr	N-CA	1.59	4.4	2.81
25 yr 72 hr	N-CA-A01c	5.81	5.05	-0.76
25 yr 72 hr	N-CA-A01d	3.45	4.4	0.95

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-A02	3.58	4.41	0.83
25 yr 72 hr	N-CA-A03	3.59	4.41	0.82
25 yr 72 hr	N-CA-A04	3.6	4.42	0.82
25 yr 72 hr	N-CA-A05	3.6	4.43	0.83
25 yr 72 hr	N-CA-A07	5.04	5.14	0.1
25 yr 72 hr	N-CA-B03	3.59	4.41	0.82
25 yr 72 hr	N-CA-B04	3.6	4.42	0.82
25 yr 72 hr	N-CA-B07	4.7	5.03	0.33
25 yr 72 hr	N-CA-C03	3.38	4.4	1.02
25 yr 72 hr	N-CA-C04	3.35	4.4	1.05
25 yr 72 hr	N-CA-C05	3.39	4.41	1.02
25 yr 72 hr	N-CA-D06	3.64	4.43	0.79
25 yr 72 hr	N-CA-D07	3.65	4.43	0.78
25 yr 72 hr	N-CA-D07x	3.81	4.43	0.62
25 yr 72 hr	N-CA-D08	3.4	4.43	1.03
25 yr 72 hr	N-CA-D08x	3.66	4.43	0.77
25 yr 72 hr	N-CA-D09x	3.4	4.43	1.03
25 yr 72 hr	N-CA-E07	4.8	5.04	0.24
25 yr 72 hr	N-CA-E08	4.82	5.04	0.22
25 yr 72 hr	N-CA-E09x	5.03	5.05	0.02
25 yr 72 hr	N-CA-F04	3.56	4.42	0.86
25 yr 72 hr	N-CA-F05	3.36	4.42	1.06
25 yr 72 hr	N-CA-F05x	3.43	4.41	0.98
25 yr 72 hr	N-CA-F06	3.35	4.42	1.07
25 yr 72 hr	N-CA-F06x	3.33	4.41	1.08
25 yr 72 hr	N-CA-F07	3.34	4.42	1.08
25 yr 72 hr	N-CA-F07x	3.33	4.41	1.08
25 yr 72 hr	N-CA-F08	3.36	4.42	1.06
25 yr 72 hr	N-CA-F09	3.36	4.42	1.06
25 yr 72 hr	N-CA-F09x	3.36	4.42	1.06
25 yr 72 hr	N-CA-F10	3.37	4.42	1.05
25 yr 72 hr	N-CA-F11	3.37	4.42	1.05
25 yr 72 hr	N-CA-F11x	3.37	4.42	1.05
25 yr 72 hr	N-CA-F12	3.37	4.41	1.04
25 yr 72 hr	N-CA-F12x	3.37	4.42	1.05
25 yr 72 hr	N-CA-G08	3.37	4.42	1.05
25 yr 72 hr	N-CA-G09	3.38	4.43	1.05
25 yr 72 hr	N-CA-G10	3.58	4.43	0.85
25 yr 72 hr	N-CA-G11x	3.56	4.42	0.86
25 yr 72 hr	N-CA-H09	3.38	4.42	1.04
25 yr 72 hr	N-CA-H10	3.38	4.43	1.05
25 yr 72 hr	N-CA-H10x	3.37	4.42	1.05
25 yr 72 hr	N-CA-H11	3.39	4.43	1.04
25 yr 72 hr	N-CA-H11x	3.38	4.43	1.05

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Area BCDE Improvement Projects Selected Alternative with Future Conditions Tailwater(2BC,3D,1E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-H12	3.39	4.43	1.04
25 yr 72 hr	N-CA-H13	3.4	4.44	1.04
25 yr 72 hr	N-CA-H14	3.41	4.44	1.03
25 yr 72 hr	N-CA-I12	3.39	4.43	1.04
25 yr 72 hr	N-CA-I13	3.39	4.43	1.04
25 yr 72 hr	N-CA-I14	3.39	4.43	1.04
25 yr 72 hr	N-CA-J14	3.4	4.43	1.03
25 yr 72 hr	N-CA-J15x	3.4	4.44	1.04
25 yr 72 hr	N-CA-K03	3.62	4.42	0.8
25 yr 72 hr	N-CA-L04	3.6	4.42	0.82
25 yr 72 hr	N-CA-L05	3.73	4.44	0.71
25 yr 72 hr	N-CA-M06	3.77	4.45	0.68
25 yr 72 hr	N-CA-N05	3.66	4.43	0.77
25 yr 72 hr	N-CA-O08	4.98	5.02	0.04
25 yr 72 hr	N-CA-S05	3.41	4.41	1
25 yr 72 hr	N-CA-T08	3.32	4.41	1.09
25 yr 72 hr	N-CA-T09	3.32	4.41	1.09
25 yr 72 hr	N-CB	1.59	4.4	2.81
25 yr 72 hr	N-CB-A01	3.19	4.4	1.21
25 yr 72 hr	N-CB-A02	#N/A	4.4	#N/A
25 yr 72 hr	N-CB-Added	#N/A	4.4	#N/A
25 yr 72 hr	N-CC	1.59	4.4	2.81
25 yr 72 hr	N-CC-A01	3.15	4.4	1.25
25 yr 72 hr	N-CC-A02	3.18	4.4	1.22
25 yr 72 hr	N-CC-A03	3.31	4.4	1.09
25 yr 72 hr	N-CE	1.59	4.4	2.81
25 yr 72 hr	N-CE-A01	3.37	4.42	1.05
25 yr 72 hr	N-CE-A02	3.37	4.42	1.05
25 yr 72 hr	N-CE-A03	3.37	4.42	1.05
25 yr 72 hr	N-CF	1.59	4.4	2.81
25 yr 72 hr	N-CF-A01	3.38	4.42	1.04
25 yr 72 hr	N-CF-A02	3.38	4.42	1.04
25 yr 72 hr	N-CF-A03x	3.38	4.43	1.05
25 yr 72 hr	N-CG	1.59	4.4	2.81
25 yr 72 hr	N-CG-A01	3.38	4.42	1.04
25 yr 72 hr	N-CG-A02x	3.39	4.42	1.03
25 yr 72 hr	N-CG-A03x	3.39	4.42	1.03
25 yr 72 hr	N-CH	1.59	4.4	2.81
25 yr 72 hr	N-CH-A01b	1.88	4.4	2.52
25 yr 72 hr	N-CH-A02	2.75	4.4	1.65
25 yr 72 hr	N-CH-A03	3.93	4.41	0.48
25 yr 72 hr	N-CH-A04	4.03	4.42	0.39
25 yr 72 hr	N-CH-Added	#N/A	4.4	#N/A
25 yr 72 hr	N-CH-B02	2.96	4.4	1.44

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CH-B03	3.9	4.44	0.54
25 yr 72 hr	N-CH-B03x	3.08	4.4	1.32
25 yr 72 hr	N-CH-B04	3.94	4.45	0.51
25 yr 72 hr	N-CH-B04x	4.12	4.46	0.34
25 yr 72 hr	N-CH-B05	4.75	4.66	-0.09
25 yr 72 hr	N-CH-B05x	4.05	4.47	0.42
25 yr 72 hr	N-CH-B06	4.88	4.88	0
25 yr 72 hr	N-CH-B06x	4.83	4.82	-0.01
25 yr 72 hr	N-CH-B07	5.93	5.94	0.01
25 yr 72 hr	N-CH-C04	4.02	4.42	0.4
25 yr 72 hr	N-CH-C05	4.04	4.44	0.4
25 yr 72 hr	N-CH-C05x1	4.03	4.42	0.39
25 yr 72 hr	N-CH-C05x2	4.03	4.42	0.39
25 yr 72 hr	N-CH-C05x3	4.03	4.42	0.39
25 yr 72 hr	N-CH-C06	4.04	4.44	0.4
25 yr 72 hr	N-CH-C06x	4.04	4.44	0.4
25 yr 72 hr	N-CH-C07x	4.04	4.44	0.4
25 yr 72 hr	N-CH-D05	4.03	4.43	0.4
25 yr 72 hr	N-CH-D06	4.03	4.43	0.4
25 yr 72 hr	N-CH-D08x	4.04	4.43	0.39
25 yr 72 hr	N-CH-E06	4.04	4.44	0.4
25 yr 72 hr	N-CH-E07	4.04	4.44	0.4
25 yr 72 hr	N-CH-F07	4.05	4.44	0.39
25 yr 72 hr	N-CH-F08	4.05	4.44	0.39
25 yr 72 hr	N-CH-G07	4.03	4.43	0.4
25 yr 72 hr	N-CH-G08	4.03	4.42	0.39
25 yr 72 hr	N-CH-G09	4.02	4.42	0.4
25 yr 72 hr	N-CH-G10	4.02	4.42	0.4
25 yr 72 hr	N-CH-G11	4.03	4.42	0.39
25 yr 72 hr	N-CH-I04	3.99	4.42	0.43
25 yr 72 hr	N-CH-I05x1	4.02	4.42	0.4
25 yr 72 hr	N-CH-I05x2	4.01	4.41	0.4
25 yr 72 hr	N-CH-I05x3	4.01	4.42	0.41
25 yr 72 hr	N-CH-I05x4	4.02	4.42	0.4
25 yr 72 hr	N-CI	1.59	4.4	2.81
25 yr 72 hr	N-D10	4.03	4.43	0.4
25 yr 72 hr	N-D16	2.55	4.4	1.85
25 yr 72 hr	N-D19	4.89	4.74	-0.15
25 yr 72 hr	N-D20	4.89	4.71	-0.18
25 yr 72 hr	N-D22	4.86	4.87	0.01
25 yr 72 hr	N-D30	4.87	4.69	-0.18
25 yr 72 hr	N-DA	1.59	4.4	2.81
25 yr 72 hr	N-DA-A01	3.76	4.43	0.67
25 yr 72 hr	N-DB	1.59	4.4	2.81

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DC	1.59	4.4	2.81
25 yr 72 hr	N-DI-A01	3.98	4.43	0.45
25 yr 72 hr	N-DI-A02	4.02	4.45	0.43
25 yr 72 hr	N-DI-B04	4.51	4.49	-0.02
25 yr 72 hr	N-DI-B05	4.32	4.48	0.16
25 yr 72 hr	N-DI-B05x	4.83	4.63	-0.2
25 yr 72 hr	N-DI-B06	4.33	4.49	0.16
25 yr 72 hr	N-DI-B07	4.83	4.59	-0.24
25 yr 72 hr	N-DI-B08	4.83	4.61	-0.22
25 yr 72 hr	N-DI-B09	4.85	4.64	-0.21
25 yr 72 hr	N-DI-B10	4.87	4.68	-0.19
25 yr 72 hr	N-DI-B10x	4.85	4.64	-0.21
25 yr 72 hr	N-DI-B11	4.86	4.67	-0.19
25 yr 72 hr	N-DI-C03	4.09	4.47	0.38
25 yr 72 hr	N-DI-C04	4.86	4.86	0
25 yr 72 hr	N-DI-C05	4.76	4.62	-0.14
25 yr 72 hr	N-DP	4.39	4.4	0.01
25 yr 72 hr	N-DP-A01	4.54	4.4	-0.14
25 yr 72 hr	N-DP-A02	4.59	4.49	-0.1
25 yr 72 hr	N-DP-A04	4.62	4.51	-0.11
25 yr 72 hr	N-DP-A07	4.89	4.71	-0.18
25 yr 72 hr	N-DP-A08	4.89	4.71	-0.18
25 yr 72 hr	N-DP-A09	4.88	4.7	-0.18
25 yr 72 hr	N-DP-A09x	4.89	4.71	-0.18
25 yr 72 hr	N-DP-A10	4.88	4.7	-0.18
25 yr 72 hr	N-DP-A11x	4.88	4.7	-0.18
25 yr 72 hr	N-DP-B2	4.57	4.48	-0.09
25 yr 72 hr	N-DP-C02	4.59	4.4	-0.19
25 yr 72 hr	N-DP-C03	3.76	4.43	0.67
25 yr 72 hr	N-DP-C03x	4.59	4.4	-0.19
25 yr 72 hr	N-DP-D02	4.64	4.5	-0.14
25 yr 72 hr	N-DP-D03x	4.87	4.87	0
25 yr 72 hr	N-DP-D04	4.85	4.7	-0.15
25 yr 72 hr	N-DP-D05x	4.88	4.76	-0.12
25 yr 72 hr	N-DP-D06x	4.94	4.9	-0.04
25 yr 72 hr	N-DP-D07x	5.03	4.97	-0.06
25 yr 72 hr	N-DP-D08x	5.1	5.02	-0.08
25 yr 72 hr	N-DP-D09	5.19	5.1	-0.09
25 yr 72 hr	N-DP-D10	5.55	5.54	-0.01
25 yr 72 hr	N-DP-E05	4.89	4.75	-0.14
25 yr 72 hr	N-DP-E06	4.92	4.91	-0.01
25 yr 72 hr	N-DP-E08	4.89	4.74	-0.15
25 yr 72 hr	N-DP-F07	5.89	5.85	-0.04
25 yr 72 hr	N-DP-F08	5.13	5.02	-0.11

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DP-F09	5.37	5.31	-0.06
25 yr 72 hr	N-DP-G05	4.58	4.5	-0.08
25 yr 72 hr	N-DP-G06	4.58	4.5	-0.08
25 yr 72 hr	N-DP-G07	4.58	4.54	-0.04
25 yr 72 hr	N-DP-G07x	4.57	4.51	-0.06
25 yr 72 hr	N-DP-G08	4.62	4.72	0.1
25 yr 72 hr	N-DP-G08x	4.58	4.54	-0.04
25 yr 72 hr	N-DP-H04	4.58	4.49	-0.09
25 yr 72 hr	N-DP-H05	4.58	4.49	-0.09
25 yr 72 hr	N-DP-H05x	4.58	4.48	-0.1
25 yr 72 hr	N-DP-H06	4.57	4.49	-0.08
25 yr 72 hr	N-DP-H06x	4.58	4.5	-0.08
25 yr 72 hr	N-DP-K07	4.58	4.5	-0.08
25 yr 72 hr	N-DP-M10	5.26	5.15	-0.11
25 yr 72 hr	N-DP-M11	5.31	5.14	-0.17
25 yr 72 hr	N-DP-M12	5.38	5.31	-0.07
25 yr 72 hr	N-DP-N10	5.12	5.04	-0.08
25 yr 72 hr	N-DP-O10	4.88	4.71	-0.17
25 yr 72 hr	N-DP-O11	4.89	4.8	-0.09
25 yr 72 hr	N-DP-P06	4.64	4.66	0.02
25 yr 72 hr	N-DP-Y03	5.12	5.12	0
25 yr 72 hr	N-DP-Z12	4.4	4.55	0.15
25 yr 72 hr	N-DQ-A01	4.55	4.48	-0.07
25 yr 72 hr	N-DQ-A01x	#N/A	4.49	#N/A
25 yr 72 hr	N-DQ-A02	4.56	4.49	-0.07
25 yr 72 hr	N-DQ-A03	4.55	4.48	-0.07
25 yr 72 hr	N-DQ-A03x	3.13	4.41	1.28
25 yr 72 hr	N-DQ-A04	5.57	5.68	0.11
25 yr 72 hr	N-DQ-A05	4.36	4.44	0.08
25 yr 72 hr	N-DQ-A06	4.55	4.49	-0.06
25 yr 72 hr	N-DQ-A07	4.55	4.48	-0.07
25 yr 72 hr	N-DQ-A08	4.55	4.48	-0.07
25 yr 72 hr	N-E01	2.93	4.4	1.47
25 yr 72 hr	N-E02	3.39	4.4	1.01
25 yr 72 hr	N-E03	4.02	4.4	0.38
25 yr 72 hr	N-E07	4.54	4.54	0
25 yr 72 hr	N-E08	3.82	4.4	0.58
25 yr 72 hr	N-E10	3.74	4.4	0.66
25 yr 72 hr	N-E11	2.57	4.4	1.83
25 yr 72 hr	N-EA	1.59	4.4	2.81
25 yr 72 hr	N-EA-A01	3.86	4.41	0.55
25 yr 72 hr	N-EA-A02	3.86	4.41	0.55
25 yr 72 hr	N-EB	1.59	4.4	2.81
25 yr 72 hr	N-EB-A01	3.03	4.4	1.37

Kimley»Horn

Area BCDE Improvement Projects Selected Alternative with Future Conditions Tailwater(2BC,3D,1E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-EC	1.59	4.4	2.81
25 yr 72 hr	N-EC-A01	3.11	4.4	1.29
25 yr 72 hr	N-ED	1.59	4.4	2.81
25 yr 72 hr	N-ED-A01	3.63	4.41	0.78
25 yr 72 hr	N-ED-A02	3.64	4.4	0.76
25 yr 72 hr	N-ED-A03	3.64	4.41	0.77
25 yr 72 hr	N-EE	1.59	4.4	2.81
25 yr 72 hr	N-EE-A01	3.71	4.41	0.7
25 yr 72 hr	N-EF	1.59	4.4	2.81
25 yr 72 hr	N-EF-A01	3.71	4.4	0.69
25 yr 72 hr	N-EG	1.59	4.4	2.81
25 yr 72 hr	N-EG-A01	3.46	4.4	0.94
25 yr 72 hr	N-EG-A02	3.66	4.4	0.74
25 yr 72 hr	N-EH	1.59	4.4	2.81
25 yr 72 hr	N-EH-A01	2.02	4.4	2.38
25 yr 72 hr	N-EI	1.59	4.4	2.81
25 yr 72 hr	N-EJ	1.59	4.4	2.81
25 yr 72 hr	N-EJ-A01	1.65	4.4	2.75
25 yr 72 hr	N-EK	1.59	4.4	2.81
25 yr 72 hr	N-EK-A01	3.76	4.4	0.64
25 yr 72 hr	N-EL	1.59	4.4	2.81
25 yr 72 hr	N-EL-A01	3.04	4.4	1.36
25 yr 72 hr	N-EM	1.59	4.4	2.81
25 yr 72 hr	N-EM-A01	2.83	4.4	1.57
25 yr 72 hr	N-EM-A02	2.74	4.4	1.66
25 yr 72 hr	N-EM-A03	2.57	4.4	1.83
25 yr 72 hr	N-EN	1.59	4.4	2.81
25 yr 72 hr	N-EN-A01	2.92	4.4	1.48
25 yr 72 hr	N-EO	1.59	4.4	2.81
25 yr 72 hr	N-EO-A01	2.46	4.4	1.94
25 yr 72 hr	N-EP	1.59	4.4	2.81
25 yr 72 hr	N-EP-A01	2.56	4.4	1.84
25 yr 72 hr	N-EQ	1.59	4.4	2.81
25 yr 72 hr	N-EQ-A01	1.67	4.42	2.75
25 yr 72 hr	N-ER	1.59	4.4	2.81
25 yr 72 hr	N-ES	1.59	4.4	2.81
25 yr 72 hr	N-ET	1.59	4.4	2.81
25 yr 72 hr	N-ET-A01	1.6	4.4	2.8
25 yr 72 hr	N-Pump-C3	#N/A	4.4	#N/A
25 yr 72 hr	Trunkline-Junction-1	#N/A	4.4	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	9thSt-Node	#N/A	-1.2	#N/A
10 yr 1 hr	B-Pump Node	#N/A	-6	#N/A
10 yr 1 hr	B-Pump Node 2	#N/A	-2.15	#N/A
10 yr 1 hr	N-BA	1.59	4.4	2.81
10 yr 1 hr	N-BA-A01	3.33	-0.58	-3.91
10 yr 1 hr	N-BA-A02	3.37	0.65	-2.72
10 yr 1 hr	N-BA-A03	3.4	1.15	-2.25
10 yr 1 hr	N-BA-A03x	3.37	0.77	-2.6
10 yr 1 hr	N-BA-A04	3.46	1.51	-1.95
10 yr 1 hr	N-BA-A04x	3.4	1.15	-2.25
10 yr 1 hr	N-BA-A05	3.46	1.7	-1.76
10 yr 1 hr	N-BA-A06	3.58	1.84	-1.74
10 yr 1 hr	N-BA-A07	3.65	2.11	-1.54
10 yr 1 hr	N-BA-A07x	3.61	1.84	-1.77
10 yr 1 hr	N-BA-A08	3.76	2.19	-1.57
10 yr 1 hr	N-BA-A08x	3.65	2.3	-1.35
10 yr 1 hr	N-BA-A09	3.91	3.83	-0.08
10 yr 1 hr	N-BA-B02	3.26	0.91	-2.35
10 yr 1 hr	N-BA-B03	3.26	1.08	-2.18
10 yr 1 hr	N-BA-B04	3.25	1.14	-2.11
10 yr 1 hr	N-BA-C03	3.33	1.4	-1.93
10 yr 1 hr	N-BA-C04	3.32	-2.3	-5.62
10 yr 1 hr	N-BA-D05	3.48	1.52	-1.96
10 yr 1 hr	N-BA-D06	3.49	2.57	-0.92
10 yr 1 hr	N-BA-D07	3.65	3.21	-0.44
10 yr 1 hr	N-BA-D08	3.72	3.24	-0.48
10 yr 1 hr	N-BA-E09	3.76	2.36	-1.4
10 yr 1 hr	N-BA-F09	3.87	2.32	-1.55
10 yr 1 hr	N-BA-K04	3.39	1.91	-1.48
10 yr 1 hr	N-BA-K05	3.41	2.52	-0.89
10 yr 1 hr	N-BA-K06	3.6	2.89	-0.71
10 yr 1 hr	N-BA-K08	5.06	5.04	-0.02
10 yr 1 hr	N-BA-L06	3.54	2.19	-1.35
10 yr 1 hr	N-BA-Q05	3.38	-1.24	-4.62
10 yr 1 hr	N-BA-Q06	3.38	-1.24	-4.62
10 yr 1 hr	N-BA-Q06x	3.38	-1.25	-4.63
10 yr 1 hr	N-BA-Q07	3.38	-1.23	-4.61
10 yr 1 hr	N-BA-Q07x	3.37	-1.21	-4.58
10 yr 1 hr	N-BA-Q08	3.39	-0.3	-3.69
10 yr 1 hr	N-BA-R06	3.39	-1.23	-4.62
10 yr 1 hr	N-BA-R07	3.38	-1.23	-4.61
10 yr 1 hr	N-BA-R07x	3.4	-0.06	-3.46
10 yr 1 hr	N-BA-R08	3.38	-1.25	-4.63
10 yr 1 hr	N-BA-R08x	3.39	-1.12	-4.51

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA-R09	3.38	-1.19	-4.57
10 yr 1 hr	N-BA-R10	3.38	-0.2	-3.58
10 yr 1 hr	N-BA-R11	3.37	-0.19	-3.56
10 yr 1 hr	N-BA-S06a	3.68	2.59	-1.09
10 yr 1 hr	N-BA-T07	3.69	2.23	-1.46
10 yr 1 hr	N-BA-T08	3.68	2.21	-1.47
10 yr 1 hr	N-BA-T08x	3.69	2.23	-1.46
10 yr 1 hr	N-BA-T09	3.4	2.22	-1.18
10 yr 1 hr	N-BA-T09x	3.68	2.21	-1.47
10 yr 1 hr	N-BA-T10	3.4	2.22	-1.18
10 yr 1 hr	N-BA-U02	3.32	1.08	-2.24
10 yr 1 hr	N-BA-U03	3.33	1.17	-2.16
10 yr 1 hr	N-BA-V07	3.75	3.71	-0.04
10 yr 1 hr	N-BA-W08	4.19	3.44	-0.75
10 yr 1 hr	N-BA-W09A	4.2	3.34	-0.86
10 yr 1 hr	N-BA-W09B	4.17	3.21	-0.96
10 yr 1 hr	N-BB	1.59	4.4	2.81
10 yr 1 hr	N-BB-A01	3.32	-0.86	-4.18
10 yr 1 hr	N-BB-A02	3.33	-0.88	-4.21
10 yr 1 hr	N-BB-A03	3.31	-0.35	-3.66
10 yr 1 hr	N-BB-A04	3.32	-0.34	-3.66
10 yr 1 hr	N-BC	1.59	4.4	2.81
10 yr 1 hr	N-BC-A01	2.39	2.19	-0.2
10 yr 1 hr	N-BC-A02	4.78	2.64	-2.14
10 yr 1 hr	N-BD	1.59	4.4	2.81
10 yr 1 hr	N-BD-A01	3.33	-2.83	-6.16
10 yr 1 hr	N-BD-A02	3.36	-1.34	-4.7
10 yr 1 hr	N-BD-A02x	3.37	-0.51	-3.88
10 yr 1 hr	N-BD-A03	3.37	-1.28	-4.65
10 yr 1 hr	N-BD-A05	3.37	-1.22	-4.59
10 yr 1 hr	N-BD-B02	3.33	-1.9	-5.23
10 yr 1 hr	N-BD-B03	3.32	-1.36	-4.68
10 yr 1 hr	N-BD-B04	3.32	2.41	-0.91
10 yr 1 hr	N-BD-B04x	3.32	-1.19	-4.51
10 yr 1 hr	N-BE	1.59	4.4	2.81
10 yr 1 hr	N-BE-A01	3.31	3.03	-0.28
10 yr 1 hr	N-BE-A03	3.39	-1.24	-4.63
10 yr 1 hr	N-BE-A04	3.4	0.68	-2.72
10 yr 1 hr	N-BF	1.59	4.4	2.81
10 yr 1 hr	N-BF-A01	3.9	3.92	0.02
10 yr 1 hr	N-BG	#N/A	4.4	#N/A
10 yr 1 hr	N-CA	1.59	4.4	2.81
10 yr 1 hr	N-CA-A01c	5.81	5.05	-0.76
10 yr 1 hr	N-CA-A01d	3.23	-4.06	-7.29

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-A02	3.35	-2.94	-6.29
10 yr 1 hr	N-CA-A03	3.37	-2.09	-5.46
10 yr 1 hr	N-CA-A04	3.4	-0.08	-3.48
10 yr 1 hr	N-CA-A05	3.41	1.44	-1.97
10 yr 1 hr	N-CA-A07	4.72	4.8	0.08
10 yr 1 hr	N-CA-B03	3.36	1.44	-1.92
10 yr 1 hr	N-CA-B04	3.38	1.44	-1.94
10 yr 1 hr	N-CA-B07	4.35	3.61	-0.74
10 yr 1 hr	N-CA-C03	3.13	-1.72	-4.85
10 yr 1 hr	N-CA-C04	3.11	-1.72	-4.83
10 yr 1 hr	N-CA-C05	3.14	2.65	-0.49
10 yr 1 hr	N-CA-D06	3.62	3.56	-0.06
10 yr 1 hr	N-CA-D07	3.62	1.52	-2.1
10 yr 1 hr	N-CA-D07x	3.79	3.79	0
10 yr 1 hr	N-CA-D08	3.13	0.29	-2.84
10 yr 1 hr	N-CA-D08x	3.64	1.55	-2.09
10 yr 1 hr	N-CA-D09x	3.13	0.31	-2.82
10 yr 1 hr	N-CA-E07	4.42	3.74	-0.68
10 yr 1 hr	N-CA-E08	4.43	3.75	-0.68
10 yr 1 hr	N-CA-E09x	4.57	3.77	-0.8
10 yr 1 hr	N-CA-F04	3.37	-2.15	-5.52
10 yr 1 hr	N-CA-F05	3.09	-1.01	-4.1
10 yr 1 hr	N-CA-F05x	3.19	-2.15	-5.34
10 yr 1 hr	N-CA-F06	3.08	-2.07	-5.15
10 yr 1 hr	N-CA-F06x	3.07	-0.99	-4.06
10 yr 1 hr	N-CA-F07	3.08	-1.38	-4.46
10 yr 1 hr	N-CA-F07x	3.07	-1.46	-4.53
10 yr 1 hr	N-CA-F08	3.09	-0.87	-3.96
10 yr 1 hr	N-CA-F09	3.09	-0.56	-3.65
10 yr 1 hr	N-CA-F09x	3.09	-0.87	-3.96
10 yr 1 hr	N-CA-F10	3.1	-0.28	-3.38
10 yr 1 hr	N-CA-F11	3.1	-0.21	-3.31
10 yr 1 hr	N-CA-F11x	3.09	-0.22	-3.31
10 yr 1 hr	N-CA-F12	3.1	-0.21	-3.31
10 yr 1 hr	N-CA-F12x	3.1	0.99	-2.11
10 yr 1 hr	N-CA-G08	3.1	-0.69	-3.79
10 yr 1 hr	N-CA-G09	3.1	-0.65	-3.75
10 yr 1 hr	N-CA-G10	3.39	-0.63	-4.02
10 yr 1 hr	N-CA-G11x	3.37	0.11	-3.26
10 yr 1 hr	N-CA-H09	3.1	-0.32	-3.42
10 yr 1 hr	N-CA-H10	3.1	-0.13	-3.23
10 yr 1 hr	N-CA-H10x	3.1	-0.28	-3.38
10 yr 1 hr	N-CA-H11	3.12	0.24	-2.88
10 yr 1 hr	N-CA-H11x	3.1	-0.08	-3.18

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-H12	3.12	0.26	-2.86
10 yr 1 hr	N-CA-H13	3.24	1.27	-1.97
10 yr 1 hr	N-CA-H14	3.32	1.31	-2.01
10 yr 1 hr	N-CA-I12	3.12	0.7	-2.42
10 yr 1 hr	N-CA-I13	3.12	1.03	-2.09
10 yr 1 hr	N-CA-I14	3.12	1.52	-1.6
10 yr 1 hr	N-CA-J14	3.26	2.18	-1.08
10 yr 1 hr	N-CA-J15x	3.3	2.23	-1.07
10 yr 1 hr	N-CA-K03	3.36	0.63	-2.73
10 yr 1 hr	N-CA-L04	3.38	0.83	-2.55
10 yr 1 hr	N-CA-L05	3.52	1.24	-2.28
10 yr 1 hr	N-CA-M06	3.55	0.92	-2.63
10 yr 1 hr	N-CA-N05	3.57	2.46	-1.11
10 yr 1 hr	N-CA-O08	4.93	4.81	-0.12
10 yr 1 hr	N-CA-S05	3.23	0.01	-3.22
10 yr 1 hr	N-CA-T08	3.06	-1.24	-4.3
10 yr 1 hr	N-CA-T09	3.06	-1.23	-4.29
10 yr 1 hr	N-CB	1.59	4.4	2.81
10 yr 1 hr	N-CB-A01	3	-3.42	-6.42
10 yr 1 hr	N-CB-A02	#N/A	-2.78	#N/A
10 yr 1 hr	N-CB-Added	#N/A	-3.86	#N/A
10 yr 1 hr	N-CC	1.59	4.4	2.81
10 yr 1 hr	N-CC-A01	2.81	-1.77	-4.58
10 yr 1 hr	N-CC-A02	2.84	-1.77	-4.61
10 yr 1 hr	N-CC-A03	3.06	-1.82	-4.88
10 yr 1 hr	N-CE	1.59	4.4	2.81
10 yr 1 hr	N-CE-A01	3.1	2.32	-0.78
10 yr 1 hr	N-CE-A02	3.1	2.3	-0.8
10 yr 1 hr	N-CE-A03	3.1	2.29	-0.81
10 yr 1 hr	N-CF	1.59	4.4	2.81
10 yr 1 hr	N-CF-A01	3.12	1.84	-1.28
10 yr 1 hr	N-CF-A02	3.12	1.84	-1.28
10 yr 1 hr	N-CF-A03x	3.12	1.87	-1.25
10 yr 1 hr	N-CG	1.59	4.4	2.81
10 yr 1 hr	N-CG-A01	3.12	1.85	-1.27
10 yr 1 hr	N-CG-A02x	3.12	1.85	-1.27
10 yr 1 hr	N-CG-A03x	3.26	2.05	-1.21
10 yr 1 hr	N-CH	1.59	4.4	2.81
10 yr 1 hr	N-CH-A01b	1.81	-1.8	-3.61
10 yr 1 hr	N-CH-A02	2.23	-1.6	-3.83
10 yr 1 hr	N-CH-A03	3.64	-0.68	-4.32
10 yr 1 hr	N-CH-A04	3.76	-0.63	-4.39
10 yr 1 hr	N-CH-Added	#N/A	-1.82	#N/A
10 yr 1 hr	N-CH-B02	2.87	-0.21	-3.08

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CH-B03	3.84	1.95	-1.89
10 yr 1 hr	N-CH-B03x	2.89	-0.19	-3.08
10 yr 1 hr	N-CH-B04	3.91	2.75	-1.16
10 yr 1 hr	N-CH-B04x	4.04	2.18	-1.86
10 yr 1 hr	N-CH-B05	4.72	3.15	-1.57
10 yr 1 hr	N-CH-B05x	3.99	2.78	-1.21
10 yr 1 hr	N-CH-B06	4.88	4.73	-0.15
10 yr 1 hr	N-CH-B06x	4.82	3.54	-1.28
10 yr 1 hr	N-CH-B07	5.89	5.84	-0.05
10 yr 1 hr	N-CH-C04	3.75	-0.15	-3.9
10 yr 1 hr	N-CH-C05	3.77	0.04	-3.73
10 yr 1 hr	N-CH-C05x1	3.77	-0.11	-3.88
10 yr 1 hr	N-CH-C05x2	3.77	-0.15	-3.92
10 yr 1 hr	N-CH-C05x3	3.77	-0.14	-3.91
10 yr 1 hr	N-CH-C06	3.78	0.09	-3.69
10 yr 1 hr	N-CH-C06x	3.77	0.05	-3.72
10 yr 1 hr	N-CH-C07x	3.77	0.15	-3.62
10 yr 1 hr	N-CH-D05	3.77	-0.09	-3.86
10 yr 1 hr	N-CH-D06	3.77	0.12	-3.65
10 yr 1 hr	N-CH-D08x	3.77	0.35	-3.42
10 yr 1 hr	N-CH-E06	3.78	0.13	-3.65
10 yr 1 hr	N-CH-E07	3.78	0.14	-3.64
10 yr 1 hr	N-CH-F07	3.78	0.2	-3.58
10 yr 1 hr	N-CH-F08	3.78	0.22	-3.56
10 yr 1 hr	N-CH-G07	3.77	0.2	-3.57
10 yr 1 hr	N-CH-G08	3.77	0.34	-3.43
10 yr 1 hr	N-CH-G09	3.77	0.37	-3.4
10 yr 1 hr	N-CH-G10	3.77	0.45	-3.32
10 yr 1 hr	N-CH-G11	3.77	0.46	-3.31
10 yr 1 hr	N-CH-I04	3.73	0.35	-3.38
10 yr 1 hr	N-CH-I05x1	3.76	0.37	-3.39
10 yr 1 hr	N-CH-I05x2	3.76	0.94	-2.82
10 yr 1 hr	N-CH-I05x3	3.76	1.05	-2.71
10 yr 1 hr	N-CH-I05x4	3.76	0.36	-3.4
10 yr 1 hr	N-CI	1.59	4.4	2.81
10 yr 1 hr	N-D10	3.77	0.37	-3.4
10 yr 1 hr	N-D16	2.53	3.38	0.85
10 yr 1 hr	N-D19	4.78	4.67	-0.11
10 yr 1 hr	N-D20	4.77	4.52	-0.25
10 yr 1 hr	N-D22	4.79	4.75	-0.04
10 yr 1 hr	N-D30	4.76	4.5	-0.26
10 yr 1 hr	N-DA	1.59	4.4	2.81
10 yr 1 hr	N-DA-A01	3.36	4.28	0.92
10 yr 1 hr	N-DB	1.59	4.4	2.81

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Area BCDE Improvement Alternatives Future Condition TailwaterUnselected Alternative (2BCD,1E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DC	1.59	4.4	2.81
10 yr 1 hr	N-DI-A01	3.51	4.2	0.69
10 yr 1 hr	N-DI-A02	3.52	4.28	0.76
10 yr 1 hr	N-DI-B04	4.27	4.33	0.06
10 yr 1 hr	N-DI-B05	4.03	4.34	0.31
10 yr 1 hr	N-DI-B05x	4.71	4.33	-0.38
10 yr 1 hr	N-DI-B06	4.04	4.35	0.31
10 yr 1 hr	N-DI-B07	4.72	4.37	-0.35
10 yr 1 hr	N-DI-B08	4.72	4.4	-0.32
10 yr 1 hr	N-DI-B09	4.73	4.44	-0.29
10 yr 1 hr	N-DI-B10	4.75	4.49	-0.26
10 yr 1 hr	N-DI-B10x	4.73	4.44	-0.29
10 yr 1 hr	N-DI-B11	4.74	4.49	-0.25
10 yr 1 hr	N-DI-C03	3.55	4.3	0.75
10 yr 1 hr	N-DI-C04	4.78	2.81	-1.97
10 yr 1 hr	N-DI-C05	4.52	-0.48	-5
10 yr 1 hr	N-DP	4.17	-5.08	-9.25
10 yr 1 hr	N-DP-A01	4.32	-2.82	-7.14
10 yr 1 hr	N-DP-A02	4.36	-2.32	-6.68
10 yr 1 hr	N-DP-A04	4.39	-0.32	-4.71
10 yr 1 hr	N-DP-A07	4.77	4.53	-0.24
10 yr 1 hr	N-DP-A08	4.77	4.53	-0.24
10 yr 1 hr	N-DP-A09	4.77	4.51	-0.26
10 yr 1 hr	N-DP-A09x	4.77	4.53	-0.24
10 yr 1 hr	N-DP-A10	4.76	4.51	-0.25
10 yr 1 hr	N-DP-A11x	4.76	4.51	-0.25
10 yr 1 hr	N-DP-B2	4.35	-2.51	-6.86
10 yr 1 hr	N-DP-C02	4.37	-1.48	-5.85
10 yr 1 hr	N-DP-C03	3.36	4.28	0.92
10 yr 1 hr	N-DP-C03x	4.37	0.87	-3.5
10 yr 1 hr	N-DP-D02	4.43	-0.77	-5.2
10 yr 1 hr	N-DP-D03x	4.82	4.63	-0.19
10 yr 1 hr	N-DP-D04	4.59	-0.3	-4.89
10 yr 1 hr	N-DP-D05x	4.64	-0.09	-4.73
10 yr 1 hr	N-DP-D06x	4.71	0.11	-4.6
10 yr 1 hr	N-DP-D07x	4.81	0.37	-4.44
10 yr 1 hr	N-DP-D08x	4.89	0.57	-4.32
10 yr 1 hr	N-DP-D09	5.01	1.44	-3.57
10 yr 1 hr	N-DP-D10	5.4	5.32	-0.08
10 yr 1 hr	N-DP-E05	4.74	4.12	-0.62
10 yr 1 hr	N-DP-E06	4.86	4.85	-0.01
10 yr 1 hr	N-DP-E08	4.78	4.65	-0.13
10 yr 1 hr	N-DP-F07	5.1	5.01	-0.09
10 yr 1 hr	N-DP-F08	4.94	4.62	-0.32

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Area BCDE Improvement Alternatives Future Condition TailwaterUnselected Alternative (2BCD,1E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DP-F09	4.96	4.95	-0.01
10 yr 1 hr	N-DP-G05	4.36	0.05	-4.31
10 yr 1 hr	N-DP-G06	4.36	0.42	-3.94
10 yr 1 hr	N-DP-G07	4.36	0.58	-3.78
10 yr 1 hr	N-DP-G07x	4.35	0.42	-3.93
10 yr 1 hr	N-DP-G08	4.39	0.66	-3.73
10 yr 1 hr	N-DP-G08x	4.36	0.55	-3.81
10 yr 1 hr	N-DP-H04	4.36	-0.76	-5.12
10 yr 1 hr	N-DP-H05	4.36	0.1	-4.26
10 yr 1 hr	N-DP-H05x	4.36	3.79	-0.57
10 yr 1 hr	N-DP-H06	4.35	0.32	-4.03
10 yr 1 hr	N-DP-H06x	4.36	4.05	-0.31
10 yr 1 hr	N-DP-K07	4.36	0.32	-4.04
10 yr 1 hr	N-DP-M10	5.11	1.38	-3.73
10 yr 1 hr	N-DP-M11	5.2	0.79	-4.41
10 yr 1 hr	N-DP-M12	5.25	5.12	-0.13
10 yr 1 hr	N-DP-N10	4.89	0.01	-4.88
10 yr 1 hr	N-DP-O10	4.77	4.51	-0.26
10 yr 1 hr	N-DP-O11	4.88	4.55	-0.33
10 yr 1 hr	N-DP-P06	4.6	2.6	-2
10 yr 1 hr	N-DP-Y03	5.11	5.11	0
10 yr 1 hr	N-DP-Z12	4.26	4.09	-0.17
10 yr 1 hr	N-DQ-A01	4.33	-0.14	-4.47
10 yr 1 hr	N-DQ-A01x	#N/A	0.27	#N/A
10 yr 1 hr	N-DQ-A02	4.34	3.11	-1.23
10 yr 1 hr	N-DQ-A03	4.33	-0.51	-4.84
10 yr 1 hr	N-DQ-A03x	2.94	-5.1	-8.04
10 yr 1 hr	N-DQ-A04	5.32	5.6	0.28
10 yr 1 hr	N-DQ-A05	4.03	-2.57	-6.6
10 yr 1 hr	N-DQ-A06	4.33	3.36	-0.97
10 yr 1 hr	N-DQ-A07	4.33	3.4	-0.93
10 yr 1 hr	N-DQ-A08	4.33	3.45	-0.88
10 yr 1 hr	N-E01	2.9	4.4	1.5
10 yr 1 hr	N-E02	3.35	4.4	1.05
10 yr 1 hr	N-E03	4	4.4	0.4
10 yr 1 hr	N-E07	4.49	4.53	0.04
10 yr 1 hr	N-E08	3.78	4.4	0.62
10 yr 1 hr	N-E10	3.71	4.4	0.69
10 yr 1 hr	N-E11	1.83	4.4	2.57
10 yr 1 hr	N-EA	1.59	4.4	2.81
10 yr 1 hr	N-EA-A01	3.81	4.28	0.47
10 yr 1 hr	N-EA-A02	3.81	4.28	0.47
10 yr 1 hr	N-EB	1.59	4.4	2.81
10 yr 1 hr	N-EB-A01	2.52	4.29	1.77

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-EC	1.59	4.4	2.81
10 yr 1 hr	N-EC-A01	2.69	4.29	1.6
10 yr 1 hr	N-ED	1.59	4.4	2.81
10 yr 1 hr	N-ED-A01	3.24	4.28	1.04
10 yr 1 hr	N-ED-A02	3.41	4.28	0.87
10 yr 1 hr	N-ED-A03	3.51	4.28	0.77
10 yr 1 hr	N-EE	1.59	4.4	2.81
10 yr 1 hr	N-EE-A01	3.66	4.28	0.62
10 yr 1 hr	N-EF	1.59	4.4	2.81
10 yr 1 hr	N-EF-A01	3.11	4.28	1.17
10 yr 1 hr	N-EG	1.59	4.4	2.81
10 yr 1 hr	N-EG-A01	3.43	4.28	0.85
10 yr 1 hr	N-EG-A02	3.62	4.28	0.66
10 yr 1 hr	N-EH	1.59	4.4	2.81
10 yr 1 hr	N-EH-A01	1.77	4.28	2.51
10 yr 1 hr	N-EI	1.59	4.4	2.81
10 yr 1 hr	N-EJ	1.59	4.4	2.81
10 yr 1 hr	N-EJ-A01	1.61	4.4	2.79
10 yr 1 hr	N-EK	1.59	4.4	2.81
10 yr 1 hr	N-EK-A01	3.68	4.4	0.72
10 yr 1 hr	N-EL	1.59	4.4	2.81
10 yr 1 hr	N-EL-A01	3.01	4.4	1.39
10 yr 1 hr	N-EM	1.59	4.4	2.81
10 yr 1 hr	N-EM-A01	2.63	4.4	1.77
10 yr 1 hr	N-EM-A02	2.61	4.4	1.79
10 yr 1 hr	N-EM-A03	2	4.4	2.4
10 yr 1 hr	N-EN	1.59	4.4	2.81
10 yr 1 hr	N-EN-A01	2.83	4.4	1.57
10 yr 1 hr	N-EO	1.59	4.4	2.81
10 yr 1 hr	N-EO-A01	2.22	4.4	2.18
10 yr 1 hr	N-EP	1.59	4.4	2.81
10 yr 1 hr	N-EP-A01	1.98	4.4	2.42
10 yr 1 hr	N-EQ	1.59	4.4	2.81
10 yr 1 hr	N-EQ-A01	1.65	4.44	2.79
10 yr 1 hr	N-ER	1.59	4.4	2.81
10 yr 1 hr	N-ES	1.59	4.4	2.81
10 yr 1 hr	N-ET	1.59	4.4	2.81
10 yr 1 hr	N-ET-A01	1.59	4.4	2.81
10 yr 1 hr	N-P-B-A01-DSJ	#N/A	-10	#N/A
10 yr 1 hr	N-P-BE-A02-DSJ	#N/A	-2.3	#N/A
10 yr 1 hr	N-P-CG-A01-DSJ	#N/A	-9.99	#N/A
10 yr 1 hr	N-P-DI-A01-DSJ	#N/A	4.14	#N/A
10 yr 1 hr	N-P-EG-A01-DSJ	#N/A	-8.09	#N/A
10 yr 1 hr	N-Pump-C3	#N/A	-1.19	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	NAltAdd_01	#N/A	4.28	#N/A
10 yr 1 hr	Trunkline-Junction-1	#N/A	0.45	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	9thSt-Node	#N/A	1.81	#N/A
25 yr 72 hr	B-Pump Node	#N/A	-6	#N/A
25 yr 72 hr	B-Pump Node 2	#N/A	1.91	#N/A
25 yr 72 hr	N-BA	1.59	4.4	2.81
25 yr 72 hr	N-BA-A01	3.55	2.43	-1.12
25 yr 72 hr	N-BA-A02	3.6	2.99	-0.61
25 yr 72 hr	N-BA-A03	3.64	3.19	-0.45
25 yr 72 hr	N-BA-A03x	3.6	3	-0.6
25 yr 72 hr	N-BA-A04	3.71	3.35	-0.36
25 yr 72 hr	N-BA-A04x	3.63	3.19	-0.44
25 yr 72 hr	N-BA-A05	3.72	3.37	-0.35
25 yr 72 hr	N-BA-A06	3.78	3.5	-0.28
25 yr 72 hr	N-BA-A07	3.82	3.56	-0.26
25 yr 72 hr	N-BA-A07x	3.81	3.55	-0.26
25 yr 72 hr	N-BA-A08	3.83	3.56	-0.27
25 yr 72 hr	N-BA-A08x	3.82	3.57	-0.25
25 yr 72 hr	N-BA-A09	4.01	4.3	0.29
25 yr 72 hr	N-BA-B02	3.41	2.61	-0.8
25 yr 72 hr	N-BA-B03	3.41	2.62	-0.79
25 yr 72 hr	N-BA-B04	3.39	2.64	-0.75
25 yr 72 hr	N-BA-C03	3.57	2.92	-0.65
25 yr 72 hr	N-BA-C04	3.57	2.9	-0.67
25 yr 72 hr	N-BA-D05	3.73	3.37	-0.36
25 yr 72 hr	N-BA-D06	3.75	3.4	-0.35
25 yr 72 hr	N-BA-D07	3.85	3.65	-0.2
25 yr 72 hr	N-BA-D08	3.89	3.68	-0.21
25 yr 72 hr	N-BA-E09	3.83	3.57	-0.26
25 yr 72 hr	N-BA-F09	3.88	3.6	-0.28
25 yr 72 hr	N-BA-K04	3.69	3.04	-0.65
25 yr 72 hr	N-BA-K05	3.72	3.44	-0.28
25 yr 72 hr	N-BA-K06	3.78	3.73	-0.05
25 yr 72 hr	N-BA-K08	5.08	5.08	0
25 yr 72 hr	N-BA-L06	3.76	3.63	-0.13
25 yr 72 hr	N-BA-Q05	3.67	2.21	-1.46
25 yr 72 hr	N-BA-Q06	3.66	2.28	-1.38
25 yr 72 hr	N-BA-Q06x	3.67	2.07	-1.6
25 yr 72 hr	N-BA-Q07	3.68	2.44	-1.24
25 yr 72 hr	N-BA-Q07x	3.66	2.27	-1.39
25 yr 72 hr	N-BA-Q08	3.68	2.87	-0.81
25 yr 72 hr	N-BA-R06	3.69	3.05	-0.64
25 yr 72 hr	N-BA-R07	3.68	2.49	-1.19
25 yr 72 hr	N-BA-R07x	3.7	3.17	-0.53
25 yr 72 hr	N-BA-R08	3.66	2.06	-1.6
25 yr 72 hr	N-BA-R08x	3.68	2.49	-1.19

Area BCDE Improvement Projects Unselected Alternative with Future Conditions Tailwater(2BCD,1E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA-R09	3.67	2.41	-1.26
25 yr 72 hr	N-BA-R10	3.67	2.49	-1.18
25 yr 72 hr	N-BA-R11	3.65	2.48	-1.17
25 yr 72 hr	N-BA-S06a	3.94	3.82	-0.12
25 yr 72 hr	N-BA-T07	3.73	3.52	-0.21
25 yr 72 hr	N-BA-T08	3.72	3.51	-0.21
25 yr 72 hr	N-BA-T08x	3.73	3.52	-0.21
25 yr 72 hr	N-BA-T09	3.69	3.39	-0.3
25 yr 72 hr	N-BA-T09x	3.71	3.51	-0.2
25 yr 72 hr	N-BA-T10	3.69	3.37	-0.32
25 yr 72 hr	N-BA-U02	3.55	2.75	-0.8
25 yr 72 hr	N-BA-U03	3.56	3	-0.56
25 yr 72 hr	N-BA-V07	3.8	3.78	-0.02
25 yr 72 hr	N-BA-W08	4.54	4.5	-0.04
25 yr 72 hr	N-BA-W09A	4.55	4.51	-0.04
25 yr 72 hr	N-BA-W09B	4.51	4.47	-0.04
25 yr 72 hr	N-BB	1.59	4.4	2.81
25 yr 72 hr	N-BB-A01	3.6	1.84	-1.76
25 yr 72 hr	N-BB-A02	3.59	2	-1.59
25 yr 72 hr	N-BB-A03	3.57	2.01	-1.56
25 yr 72 hr	N-BB-A04	3.58	2.01	-1.57
25 yr 72 hr	N-BC	1.59	4.4	2.81
25 yr 72 hr	N-BC-A01	2.54	2.25	-0.29
25 yr 72 hr	N-BC-A02	4.82	2.77	-2.05
25 yr 72 hr	N-BD	1.59	4.4	2.81
25 yr 72 hr	N-BD-A01	3.59	0.04	-3.55
25 yr 72 hr	N-BD-A02	3.64	1.8	-1.84
25 yr 72 hr	N-BD-A02x	3.65	1.87	-1.78
25 yr 72 hr	N-BD-A03	3.65	1.88	-1.77
25 yr 72 hr	N-BD-A05	3.64	1.96	-1.68
25 yr 72 hr	N-BD-B02	3.59	0.14	-3.45
25 yr 72 hr	N-BD-B03	3.57	0.35	-3.22
25 yr 72 hr	N-BD-B04	3.64	2.61	-1.03
25 yr 72 hr	N-BD-B04x	3.57	1.79	-1.78
25 yr 72 hr	N-BE	1.59	4.4	2.81
25 yr 72 hr	N-BE-A01	3.56	3.03	-0.53
25 yr 72 hr	N-BE-A03	3.68	3.03	-0.65
25 yr 72 hr	N-BE-A04	3.68	3.05	-0.63
25 yr 72 hr	N-BF	1.59	4.4	2.81
25 yr 72 hr	N-BF-A01	4.06	4.05	-0.01
25 yr 72 hr	N-BG	#N/A	4.4	#N/A
25 yr 72 hr	N-CA	1.59	4.4	2.81
25 yr 72 hr	N-CA-A01c	5.81	5.05	-0.76
25 yr 72 hr	N-CA-A01d	3.45	1.68	-1.77

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Area BCDE Improvement Projects Unselected Alternative with Future Conditions Tailwater(2BCD,1E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-A02	3.58	2.8	-0.78
25 yr 72 hr	N-CA-A03	3.59	2.91	-0.68
25 yr 72 hr	N-CA-A04	3.6	3.14	-0.46
25 yr 72 hr	N-CA-A05	3.6	3.31	-0.29
25 yr 72 hr	N-CA-A07	5.04	5.18	0.14
25 yr 72 hr	N-CA-B03	3.59	2.96	-0.63
25 yr 72 hr	N-CA-B04	3.6	3.15	-0.45
25 yr 72 hr	N-CA-B07	4.7	4.56	-0.14
25 yr 72 hr	N-CA-C03	3.38	0.24	-3.14
25 yr 72 hr	N-CA-C04	3.35	0.24	-3.11
25 yr 72 hr	N-CA-C05	3.39	2.68	-0.71
25 yr 72 hr	N-CA-D06	3.64	3.6	-0.04
25 yr 72 hr	N-CA-D07	3.65	2.94	-0.71
25 yr 72 hr	N-CA-D07x	3.81	3.81	0
25 yr 72 hr	N-CA-D08	3.4	2.56	-0.84
25 yr 72 hr	N-CA-D08x	3.66	2.97	-0.69
25 yr 72 hr	N-CA-D09x	3.4	2.57	-0.83
25 yr 72 hr	N-CA-E07	4.8	4.59	-0.21
25 yr 72 hr	N-CA-E08	4.82	4.59	-0.23
25 yr 72 hr	N-CA-E09x	5.03	4.59	-0.44
25 yr 72 hr	N-CA-F04	3.56	0.83	-2.73
25 yr 72 hr	N-CA-F05	3.36	0.88	-2.48
25 yr 72 hr	N-CA-F05x	3.43	0.82	-2.61
25 yr 72 hr	N-CA-F06	3.35	0.83	-2.52
25 yr 72 hr	N-CA-F06x	3.33	0.89	-2.44
25 yr 72 hr	N-CA-F07	3.34	1.49	-1.85
25 yr 72 hr	N-CA-F07x	3.33	0.86	-2.47
25 yr 72 hr	N-CA-F08	3.36	1.87	-1.49
25 yr 72 hr	N-CA-F09	3.36	2	-1.36
25 yr 72 hr	N-CA-F09x	3.36	1.88	-1.48
25 yr 72 hr	N-CA-F10	3.37	2.15	-1.22
25 yr 72 hr	N-CA-F11	3.37	2.21	-1.16
25 yr 72 hr	N-CA-F11x	3.37	2.18	-1.19
25 yr 72 hr	N-CA-F12	3.37	2.21	-1.16
25 yr 72 hr	N-CA-F12x	3.37	2.23	-1.14
25 yr 72 hr	N-CA-G08	3.37	1.97	-1.4
25 yr 72 hr	N-CA-G09	3.38	2.02	-1.36
25 yr 72 hr	N-CA-G10	3.58	2.04	-1.54
25 yr 72 hr	N-CA-G11x	3.56	2.04	-1.52
25 yr 72 hr	N-CA-H09	3.38	2.27	-1.11
25 yr 72 hr	N-CA-H10	3.38	2.32	-1.06
25 yr 72 hr	N-CA-H10x	3.37	2.33	-1.04
25 yr 72 hr	N-CA-H11	3.39	2.53	-0.86
25 yr 72 hr	N-CA-H11x	3.38	2.33	-1.05

Area BCDE Improvement Projects Unselected Alternative with Future Conditions Tailwater(2BCD,1E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-H12	3.39	2.54	-0.85
25 yr 72 hr	N-CA-H13	3.4	2.65	-0.75
25 yr 72 hr	N-CA-H14	3.41	2.69	-0.72
25 yr 72 hr	N-CA-I12	3.39	2.54	-0.85
25 yr 72 hr	N-CA-I13	3.39	2.54	-0.85
25 yr 72 hr	N-CA-I14	3.39	2.55	-0.84
25 yr 72 hr	N-CA-J14	3.4	2.72	-0.68
25 yr 72 hr	N-CA-J15x	3.4	2.75	-0.65
25 yr 72 hr	N-CA-K03	3.62	2.85	-0.77
25 yr 72 hr	N-CA-L04	3.6	3.17	-0.43
25 yr 72 hr	N-CA-L05	3.73	3.6	-0.13
25 yr 72 hr	N-CA-M06	3.77	3.59	-0.18
25 yr 72 hr	N-CA-N05	3.66	3.55	-0.11
25 yr 72 hr	N-CA-O08	4.98	5.01	0.03
25 yr 72 hr	N-CA-S05	3.41	0.84	-2.57
25 yr 72 hr	N-CA-T08	3.32	1.52	-1.8
25 yr 72 hr	N-CA-T09	3.32	1.52	-1.8
25 yr 72 hr	N-CB	1.59	4.4	2.81
25 yr 72 hr	N-CB-A01	3.19	-0.41	-3.6
25 yr 72 hr	N-CB-A02	#N/A	0.22	#N/A
25 yr 72 hr	N-CB-Added	#N/A	-0.85	#N/A
25 yr 72 hr	N-CC	1.59	4.4	2.81
25 yr 72 hr	N-CC-A01	3.15	0.24	-2.91
25 yr 72 hr	N-CC-A02	3.18	0.24	-2.94
25 yr 72 hr	N-CC-A03	3.31	0.23	-3.08
25 yr 72 hr	N-CE	1.59	4.4	2.81
25 yr 72 hr	N-CE-A01	3.37	2.45	-0.92
25 yr 72 hr	N-CE-A02	3.37	2.42	-0.95
25 yr 72 hr	N-CE-A03	3.37	2.42	-0.95
25 yr 72 hr	N-CF	1.59	4.4	2.81
25 yr 72 hr	N-CF-A01	3.38	2.56	-0.82
25 yr 72 hr	N-CF-A02	3.38	2.56	-0.82
25 yr 72 hr	N-CF-A03x	3.38	2.55	-0.83
25 yr 72 hr	N-CG	1.59	4.4	2.81
25 yr 72 hr	N-CG-A01	3.38	2.55	-0.83
25 yr 72 hr	N-CG-A02x	3.39	2.56	-0.83
25 yr 72 hr	N-CG-A03x	3.39	2.69	-0.7
25 yr 72 hr	N-CH	1.59	4.4	2.81
25 yr 72 hr	N-CH-A01b	1.88	-0.09	-1.97
25 yr 72 hr	N-CH-A02	2.75	0.1	-2.65
25 yr 72 hr	N-CH-A03	3.93	0.56	-3.37
25 yr 72 hr	N-CH-A04	4.03	0.57	-3.46
25 yr 72 hr	N-CH-Added	#N/A	-0.22	#N/A
25 yr 72 hr	N-CH-B02	2.96	0.59	-2.37

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Area BCDE Improvement Projects Unselected Alternative with Future Conditions Tailwater(2BCD,1E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CH-B03	3.9	2.03	-1.87
25 yr 72 hr	N-CH-B03x	3.08	0.6	-2.48
25 yr 72 hr	N-CH-B04	3.94	2.81	-1.13
25 yr 72 hr	N-CH-B04x	4.12	2.28	-1.84
25 yr 72 hr	N-CH-B05	4.75	3.22	-1.53
25 yr 72 hr	N-CH-B05x	4.05	2.84	-1.21
25 yr 72 hr	N-CH-B06	4.88	4.75	-0.13
25 yr 72 hr	N-CH-B06x	4.83	3.62	-1.21
25 yr 72 hr	N-CH-B07	5.93	5.89	-0.04
25 yr 72 hr	N-CH-C04	4.02	0.81	-3.21
25 yr 72 hr	N-CH-C05	4.04	1.02	-3.02
25 yr 72 hr	N-CH-C05x1	4.03	0.83	-3.2
25 yr 72 hr	N-CH-C05x2	4.03	0.81	-3.22
25 yr 72 hr	N-CH-C05x3	4.03	0.81	-3.22
25 yr 72 hr	N-CH-C06	4.04	1.06	-2.98
25 yr 72 hr	N-CH-C06x	4.04	1.02	-3.02
25 yr 72 hr	N-CH-C07x	4.04	1.12	-2.92
25 yr 72 hr	N-CH-D05	4.03	0.87	-3.16
25 yr 72 hr	N-CH-D06	4.03	1.14	-2.89
25 yr 72 hr	N-CH-D08x	4.04	1.5	-2.54
25 yr 72 hr	N-CH-E06	4.04	1.18	-2.86
25 yr 72 hr	N-CH-E07	4.04	1.19	-2.85
25 yr 72 hr	N-CH-F07	4.05	1.27	-2.78
25 yr 72 hr	N-CH-F08	4.05	1.31	-2.74
25 yr 72 hr	N-CH-G07	4.03	1.19	-2.84
25 yr 72 hr	N-CH-G08	4.03	1.27	-2.76
25 yr 72 hr	N-CH-G09	4.02	1.29	-2.73
25 yr 72 hr	N-CH-G10	4.02	1.42	-2.6
25 yr 72 hr	N-CH-G11	4.03	1.44	-2.59
25 yr 72 hr	N-CH-I04	3.99	1.19	-2.8
25 yr 72 hr	N-CH-I05x1	4.02	1.2	-2.82
25 yr 72 hr	N-CH-I05x2	4.01	1.35	-2.66
25 yr 72 hr	N-CH-I05x3	4.01	1.43	-2.58
25 yr 72 hr	N-CH-I05x4	4.02	1.2	-2.82
25 yr 72 hr	N-CI	1.59	4.4	2.81
25 yr 72 hr	N-D10	4.03	1.54	-2.49
25 yr 72 hr	N-D16	2.55	3.67	1.12
25 yr 72 hr	N-D19	4.89	4.7	-0.19
25 yr 72 hr	N-D20	4.89	4.6	-0.29
25 yr 72 hr	N-D22	4.86	4.76	-0.1
25 yr 72 hr	N-D30	4.87	4.57	-0.3
25 yr 72 hr	N-DA	1.59	4.4	2.81
25 yr 72 hr	N-DA-A01	3.76	4.34	0.58
25 yr 72 hr	N-DB	1.59	4.4	2.81

Area BCDE Improvement Projects Unselected Alternative with Future Conditions Tailwater(2BCD,1E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DC	1.59	4.4	2.81
25 yr 72 hr	N-DI-A01	3.98	4.26	0.28
25 yr 72 hr	N-DI-A02	4.02	4.34	0.32
25 yr 72 hr	N-DI-B04	4.51	4.39	-0.12
25 yr 72 hr	N-DI-B05	4.32	4.41	0.09
25 yr 72 hr	N-DI-B05x	4.83	4.39	-0.44
25 yr 72 hr	N-DI-B06	4.33	4.41	0.08
25 yr 72 hr	N-DI-B07	4.83	4.45	-0.38
25 yr 72 hr	N-DI-B08	4.83	4.47	-0.36
25 yr 72 hr	N-DI-B09	4.85	4.51	-0.34
25 yr 72 hr	N-DI-B10	4.87	4.56	-0.31
25 yr 72 hr	N-DI-B10x	4.85	4.51	-0.34
25 yr 72 hr	N-DI-B11	4.86	4.56	-0.3
25 yr 72 hr	N-DI-C03	4.09	4.35	0.26
25 yr 72 hr	N-DI-C04	4.86	4.63	-0.23
25 yr 72 hr	N-DI-C05	4.76	3.58	-1.18
25 yr 72 hr	N-DP	4.39	1.39	-3
25 yr 72 hr	N-DP-A01	4.54	2.07	-2.47
25 yr 72 hr	N-DP-A02	4.59	2.89	-1.7
25 yr 72 hr	N-DP-A04	4.62	3.65	-0.97
25 yr 72 hr	N-DP-A07	4.89	4.6	-0.29
25 yr 72 hr	N-DP-A08	4.89	4.6	-0.29
25 yr 72 hr	N-DP-A09	4.88	4.58	-0.3
25 yr 72 hr	N-DP-A09x	4.89	4.6	-0.29
25 yr 72 hr	N-DP-A10	4.88	4.58	-0.3
25 yr 72 hr	N-DP-A11x	4.88	4.58	-0.3
25 yr 72 hr	N-DP-B2	4.57	2.51	-2.06
25 yr 72 hr	N-DP-C02	4.59	2.65	-1.94
25 yr 72 hr	N-DP-C03	3.76	4.34	0.58
25 yr 72 hr	N-DP-C03x	4.59	2.65	-1.94
25 yr 72 hr	N-DP-D02	4.64	3.27	-1.37
25 yr 72 hr	N-DP-D03x	4.87	4.79	-0.08
25 yr 72 hr	N-DP-D04	4.85	3.79	-1.06
25 yr 72 hr	N-DP-D05x	4.88	4.08	-0.8
25 yr 72 hr	N-DP-D06x	4.94	4.27	-0.67
25 yr 72 hr	N-DP-D07x	5.03	4.38	-0.65
25 yr 72 hr	N-DP-D08x	5.1	4.44	-0.66
25 yr 72 hr	N-DP-D09	5.19	4.59	-0.6
25 yr 72 hr	N-DP-D10	5.55	5.5	-0.05
25 yr 72 hr	N-DP-E05	4.89	4.19	-0.7
25 yr 72 hr	N-DP-E06	4.92	4.9	-0.02
25 yr 72 hr	N-DP-E08	4.89	4.69	-0.2
25 yr 72 hr	N-DP-F07	5.89	5.75	-0.14
25 yr 72 hr	N-DP-F08	5.13	4.68	-0.45

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DP-F09	5.37	5.11	-0.26
25 yr 72 hr	N-DP-G05	4.58	3.69	-0.89
25 yr 72 hr	N-DP-G06	4.58	3.69	-0.89
25 yr 72 hr	N-DP-G07	4.58	3.86	-0.72
25 yr 72 hr	N-DP-G07x	4.57	3.68	-0.89
25 yr 72 hr	N-DP-G08	4.62	4.03	-0.59
25 yr 72 hr	N-DP-G08x	4.58	3.85	-0.73
25 yr 72 hr	N-DP-H04	4.58	2.99	-1.59
25 yr 72 hr	N-DP-H05	4.58	3.16	-1.42
25 yr 72 hr	N-DP-H05x	4.58	3.8	-0.78
25 yr 72 hr	N-DP-H06	4.57	3.46	-1.11
25 yr 72 hr	N-DP-H06x	4.58	4.06	-0.52
25 yr 72 hr	N-DP-K07	4.58	3.55	-1.03
25 yr 72 hr	N-DP-M10	5.26	4.58	-0.68
25 yr 72 hr	N-DP-M11	5.31	4.3	-1.01
25 yr 72 hr	N-DP-M12	5.38	5.27	-0.11
25 yr 72 hr	N-DP-N10	5.12	4.48	-0.64
25 yr 72 hr	N-DP-O10	4.88	4.59	-0.29
25 yr 72 hr	N-DP-O11	4.89	4.66	-0.23
25 yr 72 hr	N-DP-P06	4.64	4.28	-0.36
25 yr 72 hr	N-DP-Y03	5.12	5.12	0
25 yr 72 hr	N-DP-Z12	4.4	4.16	-0.24
25 yr 72 hr	N-DQ-A01	4.55	2.93	-1.62
25 yr 72 hr	N-DQ-A01x	#N/A	3.44	#N/A
25 yr 72 hr	N-DQ-A02	4.56	3.18	-1.38
25 yr 72 hr	N-DQ-A03	4.55	2.5	-2.05
25 yr 72 hr	N-DQ-A03x	3.13	0.98	-2.15
25 yr 72 hr	N-DQ-A04	5.57	5.68	0.11
25 yr 72 hr	N-DQ-A05	4.36	1.76	-2.6
25 yr 72 hr	N-DQ-A06	4.55	3.38	-1.17
25 yr 72 hr	N-DQ-A07	4.55	3.43	-1.12
25 yr 72 hr	N-DQ-A08	4.55	3.47	-1.08
25 yr 72 hr	N-E01	2.93	4.4	1.47
25 yr 72 hr	N-E02	3.39	4.4	1.01
25 yr 72 hr	N-E03	4.02	4.4	0.38
25 yr 72 hr	N-E07	4.54	4.54	0
25 yr 72 hr	N-E08	3.82	4.4	0.58
25 yr 72 hr	N-E10	3.74	4.4	0.66
25 yr 72 hr	N-E11	2.57	4.4	1.83
25 yr 72 hr	N-EA	1.59	4.4	2.81
25 yr 72 hr	N-EA-A01	3.86	4.34	0.48
25 yr 72 hr	N-EA-A02	3.86	4.34	0.48
25 yr 72 hr	N-EB	1.59	4.4	2.81
25 yr 72 hr	N-EB-A01	3.03	4.34	1.31

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Area BCDE Improvement Projects Unselected Alternative with Future Conditions Tailwater(2BCD,1E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-EC	1.59	4.4	2.81
25 yr 72 hr	N-EC-A01	3.11	4.34	1.23
25 yr 72 hr	N-ED	1.59	4.4	2.81
25 yr 72 hr	N-ED-A01	3.63	4.33	0.7
25 yr 72 hr	N-ED-A02	3.64	4.33	0.69
25 yr 72 hr	N-ED-A03	3.64	4.34	0.7
25 yr 72 hr	N-EE	1.59	4.4	2.81
25 yr 72 hr	N-EE-A01	3.71	4.33	0.62
25 yr 72 hr	N-EF	1.59	4.4	2.81
25 yr 72 hr	N-EF-A01	3.71	4.33	0.62
25 yr 72 hr	N-EG	1.59	4.4	2.81
25 yr 72 hr	N-EG-A01	3.46	4.33	0.87
25 yr 72 hr	N-EG-A02	3.66	4.33	0.67
25 yr 72 hr	N-EH	1.59	4.4	2.81
25 yr 72 hr	N-EH-A01	2.02	4.33	2.31
25 yr 72 hr	N-EI	1.59	4.4	2.81
25 yr 72 hr	N-EJ	1.59	4.4	2.81
25 yr 72 hr	N-EJ-A01	1.65	4.4	2.75
25 yr 72 hr	N-EK	1.59	4.4	2.81
25 yr 72 hr	N-EK-A01	3.76	4.4	0.64
25 yr 72 hr	N-EL	1.59	4.4	2.81
25 yr 72 hr	N-EL-A01	3.04	4.4	1.36
25 yr 72 hr	N-EM	1.59	4.4	2.81
25 yr 72 hr	N-EM-A01	2.83	4.4	1.57
25 yr 72 hr	N-EM-A02	2.74	4.4	1.66
25 yr 72 hr	N-EM-A03	2.57	4.4	1.83
25 yr 72 hr	N-EN	1.59	4.4	2.81
25 yr 72 hr	N-EN-A01	2.92	4.4	1.48
25 yr 72 hr	N-EO	1.59	4.4	2.81
25 yr 72 hr	N-EO-A01	2.46	4.4	1.94
25 yr 72 hr	N-EP	1.59	4.4	2.81
25 yr 72 hr	N-EP-A01	2.56	4.4	1.84
25 yr 72 hr	N-EQ	1.59	4.4	2.81
25 yr 72 hr	N-EQ-A01	1.67	4.46	2.79
25 yr 72 hr	N-ER	1.59	4.4	2.81
25 yr 72 hr	N-ES	1.59	4.4	2.81
25 yr 72 hr	N-ET	1.59	4.4	2.81
25 yr 72 hr	N-ET-A01	1.6	4.4	2.8
25 yr 72 hr	N-P-B-A01-DSJ	#N/A	1.31	#N/A
25 yr 72 hr	N-P-BE-A02-DSJ	#N/A	2.88	#N/A
25 yr 72 hr	N-P-CG-A01-DSJ	#N/A	-9.99	#N/A
25 yr 72 hr	N-P-DI-A01-DSJ	#N/A	4.21	#N/A
25 yr 72 hr	N-P-EG-A01-DSJ	#N/A	-6.44	#N/A
25 yr 72 hr	N-Pump-C3	#N/A	1.75	#N/A

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Area BCDE Improvement Projects Unselected Alternative with Future Conditions Tailwater(2BCD,1E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	NAltAdd_01	#N/A	4.33	#N/A
25 yr 72 hr	Trunkline-Junction-1	#N/A	2.8	#N/A

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Area BCDE Improvement Alternatives Future Condition Tailwater Unselected Alternative (3BCD,2E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	9thSt-Node	#N/A	4.41	#N/A
10 yr 1 hr	N-BA	1.59	4.4	2.81
10 yr 1 hr	N-BA-A01	3.33	4.42	1.09
10 yr 1 hr	N-BA-A02	3.37	4.43	1.06
10 yr 1 hr	N-BA-A03	3.4	4.43	1.03
10 yr 1 hr	N-BA-A03x	3.37	4.43	1.06
10 yr 1 hr	N-BA-A04	3.46	4.44	0.98
10 yr 1 hr	N-BA-A04x	3.4	4.44	1.04
10 yr 1 hr	N-BA-A05	3.46	4.45	0.99
10 yr 1 hr	N-BA-A06	3.58	4.45	0.87
10 yr 1 hr	N-BA-A07	3.65	4.46	0.81
10 yr 1 hr	N-BA-A07x	3.61	4.46	0.85
10 yr 1 hr	N-BA-A08	3.76	4.46	0.7
10 yr 1 hr	N-BA-A08x	3.65	4.46	0.81
10 yr 1 hr	N-BA-A09	3.91	4.73	0.82
10 yr 1 hr	N-BA-B02	3.26	4.41	1.15
10 yr 1 hr	N-BA-B03	3.26	4.41	1.15
10 yr 1 hr	N-BA-B04	3.25	4.41	1.16
10 yr 1 hr	N-BA-C03	3.33	4.42	1.09
10 yr 1 hr	N-BA-C04	3.32	4.42	1.1
10 yr 1 hr	N-BA-D05	3.48	4.45	0.97
10 yr 1 hr	N-BA-D06	3.49	4.45	0.96
10 yr 1 hr	N-BA-D07	3.65	4.46	0.81
10 yr 1 hr	N-BA-D08	3.72	4.46	0.74
10 yr 1 hr	N-BA-E09	3.76	4.46	0.7
10 yr 1 hr	N-BA-F09	3.87	4.45	0.58
10 yr 1 hr	N-BA-K04	3.39	4.44	1.05
10 yr 1 hr	N-BA-K05	3.41	4.45	1.04
10 yr 1 hr	N-BA-K06	3.6	4.46	0.86
10 yr 1 hr	N-BA-K08	5.06	5.09	0.03
10 yr 1 hr	N-BA-L06	3.54	4.45	0.91
10 yr 1 hr	N-BA-Q05	3.38	4.44	1.06
10 yr 1 hr	N-BA-Q06	3.38	4.44	1.06
10 yr 1 hr	N-BA-Q06x	3.38	4.44	1.06
10 yr 1 hr	N-BA-Q07	3.38	4.44	1.06
10 yr 1 hr	N-BA-Q07x	3.37	4.43	1.06
10 yr 1 hr	N-BA-Q08	3.39	4.44	1.05
10 yr 1 hr	N-BA-R06	3.39	4.44	1.05
10 yr 1 hr	N-BA-R07	3.38	4.44	1.06
10 yr 1 hr	N-BA-R07x	3.4	4.45	1.05
10 yr 1 hr	N-BA-R08	3.38	4.43	1.05
10 yr 1 hr	N-BA-R08x	3.39	4.44	1.05
10 yr 1 hr	N-BA-R09	3.38	4.44	1.06
10 yr 1 hr	N-BA-R10	3.38	4.44	1.06

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA-R11	3.37	4.43	1.06
10 yr 1 hr	N-BA-S06a	3.68	4.46	0.78
10 yr 1 hr	N-BA-T07	3.69	4.45	0.76
10 yr 1 hr	N-BA-T08	3.68	4.45	0.77
10 yr 1 hr	N-BA-T08x	3.69	4.45	0.76
10 yr 1 hr	N-BA-T09	3.4	4.44	1.04
10 yr 1 hr	N-BA-T09x	3.68	4.45	0.77
10 yr 1 hr	N-BA-T10	3.4	4.44	1.04
10 yr 1 hr	N-BA-U02	3.32	4.42	1.1
10 yr 1 hr	N-BA-U03	3.33	4.42	1.09
10 yr 1 hr	N-BA-V07	3.75	4.45	0.7
10 yr 1 hr	N-BA-W08	4.19	4.6	0.41
10 yr 1 hr	N-BA-W09A	4.2	4.61	0.41
10 yr 1 hr	N-BA-W09B	4.17	4.57	0.4
10 yr 1 hr	N-BB	1.59	4.4	2.81
10 yr 1 hr	N-BB-A01	3.32	4.42	1.1
10 yr 1 hr	N-BB-A02	3.33	4.42	1.09
10 yr 1 hr	N-BB-A03	3.31	4.42	1.11
10 yr 1 hr	N-BB-A04	3.32	4.42	1.1
10 yr 1 hr	N-BC	1.59	4.4	2.81
10 yr 1 hr	N-BC-A01	2.39	4.41	2.02
10 yr 1 hr	N-BC-A02	4.78	4.74	-0.04
10 yr 1 hr	N-BD	1.59	4.4	2.81
10 yr 1 hr	N-BD-A01	3.33	4.41	1.08
10 yr 1 hr	N-BD-A02	3.36	4.43	1.07
10 yr 1 hr	N-BD-A02x	3.37	4.43	1.06
10 yr 1 hr	N-BD-A03	3.37	4.43	1.06
10 yr 1 hr	N-BD-A05	3.37	4.43	1.06
10 yr 1 hr	N-BD-B02	3.33	4.42	1.09
10 yr 1 hr	N-BD-B03	3.32	4.41	1.09
10 yr 1 hr	N-BD-B04	3.32	4.42	1.1
10 yr 1 hr	N-BD-B04x	3.32	4.41	1.09
10 yr 1 hr	N-BE	1.59	4.4	2.81
10 yr 1 hr	N-BE-A01	3.31	4.42	1.11
10 yr 1 hr	N-BE-A03	3.39	4.44	1.05
10 yr 1 hr	N-BE-A04	3.4	4.44	1.04
10 yr 1 hr	N-BF	1.59	4.4	2.81
10 yr 1 hr	N-BF-A01	3.9	4.48	0.58
10 yr 1 hr	N-CA	1.59	4.4	2.81
10 yr 1 hr	N-CA-A01c	5.81	4.47	-1.34
10 yr 1 hr	N-CA-A01d	3.23	4.4	1.17
10 yr 1 hr	N-CA-A02	3.35	4.41	1.06
10 yr 1 hr	N-CA-A03	3.37	4.42	1.05
10 yr 1 hr	N-CA-A04	3.4	4.42	1.02

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Area BCDE Improvement Alternatives Future Condition Tailwater Unselected Alternative (3BCD,2E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-A05	3.41	4.43	1.02
10 yr 1 hr	N-CA-A07	4.72	4.92	0.2
10 yr 1 hr	N-CA-B03	3.36	4.42	1.06
10 yr 1 hr	N-CA-B04	3.38	4.42	1.04
10 yr 1 hr	N-CA-B07	4.35	4.84	0.49
10 yr 1 hr	N-CA-C03	3.13	4.41	1.28
10 yr 1 hr	N-CA-C04	3.11	4.41	1.3
10 yr 1 hr	N-CA-C05	3.14	4.41	1.27
10 yr 1 hr	N-CA-D06	3.62	4.43	0.81
10 yr 1 hr	N-CA-D07	3.62	4.43	0.81
10 yr 1 hr	N-CA-D07x	3.79	4.43	0.64
10 yr 1 hr	N-CA-D08	3.13	4.43	1.3
10 yr 1 hr	N-CA-D08x	3.64	4.43	0.79
10 yr 1 hr	N-CA-D09x	3.13	4.43	1.3
10 yr 1 hr	N-CA-E07	4.42	4.89	0.47
10 yr 1 hr	N-CA-E08	4.43	4.9	0.47
10 yr 1 hr	N-CA-E09x	4.57	4.91	0.34
10 yr 1 hr	N-CA-F04	3.37	4.42	1.05
10 yr 1 hr	N-CA-F05	3.09	4.42	1.33
10 yr 1 hr	N-CA-F05x	3.19	4.42	1.23
10 yr 1 hr	N-CA-F06	3.08	4.42	1.34
10 yr 1 hr	N-CA-F06x	3.07	4.41	1.34
10 yr 1 hr	N-CA-F07	3.08	4.41	1.33
10 yr 1 hr	N-CA-F07x	3.07	4.41	1.34
10 yr 1 hr	N-CA-F08	3.09	4.42	1.33
10 yr 1 hr	N-CA-F09	3.09	4.42	1.33
10 yr 1 hr	N-CA-F09x	3.09	4.41	1.32
10 yr 1 hr	N-CA-F10	3.1	4.41	1.31
10 yr 1 hr	N-CA-F11	3.1	4.41	1.31
10 yr 1 hr	N-CA-F11x	3.09	4.42	1.33
10 yr 1 hr	N-CA-F12	3.1	4.41	1.31
10 yr 1 hr	N-CA-F12x	3.1	4.41	1.31
10 yr 1 hr	N-CA-G08	3.1	4.42	1.32
10 yr 1 hr	N-CA-G09	3.1	4.42	1.32
10 yr 1 hr	N-CA-G10	3.39	4.43	1.04
10 yr 1 hr	N-CA-G11x	3.37	4.42	1.05
10 yr 1 hr	N-CA-H09	3.1	4.42	1.32
10 yr 1 hr	N-CA-H10	3.1	4.42	1.32
10 yr 1 hr	N-CA-H10x	3.1	4.42	1.32
10 yr 1 hr	N-CA-H11	3.12	4.42	1.3
10 yr 1 hr	N-CA-H11x	3.1	4.42	1.32
10 yr 1 hr	N-CA-H12	3.12	4.42	1.3
10 yr 1 hr	N-CA-H13	3.24	4.43	1.19
10 yr 1 hr	N-CA-H14	3.32	4.43	1.11

Area BCDE Improvement Alternatives Future Condition Tailwater Unselected Alternative (3BCD,2E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-I12	3.12	4.42	1.3
10 yr 1 hr	N-CA-I13	3.12	4.42	1.3
10 yr 1 hr	N-CA-I14	3.12	4.42	1.3
10 yr 1 hr	N-CA-J14	3.26	4.43	1.17
10 yr 1 hr	N-CA-J15x	3.3	4.43	1.13
10 yr 1 hr	N-CA-K03	3.36	4.43	1.07
10 yr 1 hr	N-CA-L04	3.38	4.42	1.04
10 yr 1 hr	N-CA-L05	3.52	4.44	0.92
10 yr 1 hr	N-CA-M06	3.55	4.45	0.9
10 yr 1 hr	N-CA-N05	3.57	4.43	0.86
10 yr 1 hr	N-CA-O08	4.93	4.92	-0.01
10 yr 1 hr	N-CA-S05	3.23	4.42	1.19
10 yr 1 hr	N-CA-T08	3.06	4.41	1.35
10 yr 1 hr	N-CA-T09	3.06	4.41	1.35
10 yr 1 hr	N-CB	1.59	4.4	2.81
10 yr 1 hr	N-CB-A01	3	4.4	1.4
10 yr 1 hr	N-CB-Added	#N/A	4.4	#N/A
10 yr 1 hr	N-CC	1.59	4.4	2.81
10 yr 1 hr	N-CC-A01	2.81	4.4	1.59
10 yr 1 hr	N-CC-A02	2.84	4.41	1.57
10 yr 1 hr	N-CC-A03	3.06	4.4	1.34
10 yr 1 hr	N-CE	1.59	4.4	2.81
10 yr 1 hr	N-CE-A01	3.1	4.41	1.31
10 yr 1 hr	N-CE-A02	3.1	4.42	1.32
10 yr 1 hr	N-CE-A03	3.1	4.42	1.32
10 yr 1 hr	N-CF	1.59	4.4	2.81
10 yr 1 hr	N-CF-A01	3.12	4.41	1.29
10 yr 1 hr	N-CF-A02	3.12	4.42	1.3
10 yr 1 hr	N-CF-A03x	3.12	4.42	1.3
10 yr 1 hr	N-CG	1.59	4.4	2.81
10 yr 1 hr	N-CG-A01	3.12	4.41	1.29
10 yr 1 hr	N-CG-A02x	3.12	4.42	1.3
10 yr 1 hr	N-CG-A03x	3.26	4.42	1.16
10 yr 1 hr	N-CH	1.59	4.4	2.81
10 yr 1 hr	N-CH-A01b	1.81	4.4	2.59
10 yr 1 hr	N-CH-A02	2.23	4.4	2.17
10 yr 1 hr	N-CH-A03	3.64	4.41	0.77
10 yr 1 hr	N-CH-A04	3.76	4.42	0.66
10 yr 1 hr	N-CH-Added	#N/A	4.4	#N/A
10 yr 1 hr	N-CH-B02	2.87	4.41	1.54
10 yr 1 hr	N-CH-B03	3.84	4.43	0.59
10 yr 1 hr	N-CH-B03x	2.89	4.41	1.52
10 yr 1 hr	N-CH-B04	3.91	4.43	0.52
10 yr 1 hr	N-CH-B04x	4.04	4.46	0.42

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CH-B05	4.72	4.72	0
10 yr 1 hr	N-CH-B05x	3.99	4.47	0.48
10 yr 1 hr	N-CH-B06	4.88	4.88	0
10 yr 1 hr	N-CH-B06x	4.82	4.82	0
10 yr 1 hr	N-CH-B07	5.89	5.9	0.01
10 yr 1 hr	N-CH-C04	3.75	4.42	0.67
10 yr 1 hr	N-CH-C05	3.77	4.43	0.66
10 yr 1 hr	N-CH-C05x1	3.77	4.42	0.65
10 yr 1 hr	N-CH-C05x2	3.77	4.42	0.65
10 yr 1 hr	N-CH-C05x3	3.77	4.42	0.65
10 yr 1 hr	N-CH-C06	3.78	4.44	0.66
10 yr 1 hr	N-CH-C06x	3.77	4.43	0.66
10 yr 1 hr	N-CH-C07x	3.77	4.44	0.67
10 yr 1 hr	N-CH-D05	3.77	4.42	0.65
10 yr 1 hr	N-CH-D06	3.77	4.43	0.66
10 yr 1 hr	N-CH-D08x	3.77	4.43	0.66
10 yr 1 hr	N-CH-E06	3.78	4.43	0.65
10 yr 1 hr	N-CH-E07	3.78	4.43	0.65
10 yr 1 hr	N-CH-F07	3.78	4.44	0.66
10 yr 1 hr	N-CH-F08	3.78	4.44	0.66
10 yr 1 hr	N-CH-G07	3.77	4.42	0.65
10 yr 1 hr	N-CH-G08	3.77	4.42	0.65
10 yr 1 hr	N-CH-G09	3.77	4.41	0.64
10 yr 1 hr	N-CH-G10	3.77	4.41	0.64
10 yr 1 hr	N-CH-G11	3.77	4.42	0.65
10 yr 1 hr	N-CH-I04	3.73	4.41	0.68
10 yr 1 hr	N-CH-I05x1	3.76	4.42	0.66
10 yr 1 hr	N-CH-I05x2	3.76	4.41	0.65
10 yr 1 hr	N-CH-I05x3	3.76	4.41	0.65
10 yr 1 hr	N-CH-I05x4	3.76	4.42	0.66
10 yr 1 hr	N-CI	1.59	4.4	2.81
10 yr 1 hr	N-D10	3.77	4.42	0.65
10 yr 1 hr	N-D16	2.53	4.4	1.87
10 yr 1 hr	N-D19	4.78	4.7	-0.08
10 yr 1 hr	N-D20	4.77	4.67	-0.1
10 yr 1 hr	N-D22	4.79	4.84	0.05
10 yr 1 hr	N-D30	4.76	4.65	-0.11
10 yr 1 hr	N-DA	1.59	4.4	2.81
10 yr 1 hr	N-DA-A01	3.36	4.42	1.06
10 yr 1 hr	N-DB	1.59	4.4	2.81
10 yr 1 hr	N-DC	1.59	4.4	2.81
10 yr 1 hr	N-DI-A01	3.51	4.42	0.91
10 yr 1 hr	N-DI-A02	3.52	4.43	0.91
10 yr 1 hr	N-DI-B04	4.27	4.46	0.19

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Area BCDE Improvement Alternatives Future Condition Tailwater Unselected Alternative (3BCD,2E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DI-B05	4.03	4.46	0.43
10 yr 1 hr	N-DI-B05x	4.71	4.57	-0.14
10 yr 1 hr	N-DI-B06	4.04	4.46	0.42
10 yr 1 hr	N-DI-B07	4.72	4.53	-0.19
10 yr 1 hr	N-DI-B08	4.72	4.56	-0.16
10 yr 1 hr	N-DI-B09	4.73	4.59	-0.14
10 yr 1 hr	N-DI-B10	4.75	4.63	-0.12
10 yr 1 hr	N-DI-B10x	4.73	4.59	-0.14
10 yr 1 hr	N-DI-B11	4.74	4.63	-0.11
10 yr 1 hr	N-DI-C03	3.55	4.45	0.9
10 yr 1 hr	N-DI-C04	4.78	4.84	0.06
10 yr 1 hr	N-DI-C05	4.52	4.52	0
10 yr 1 hr	N-DP	4.17	4.4	0.23
10 yr 1 hr	N-DP-A01	4.32	4.4	0.08
10 yr 1 hr	N-DP-A02	4.36	4.43	0.07
10 yr 1 hr	N-DP-A04	4.39	4.44	0.05
10 yr 1 hr	N-DP-A07	4.77	4.67	-0.1
10 yr 1 hr	N-DP-A08	4.77	4.67	-0.1
10 yr 1 hr	N-DP-A09	4.77	4.66	-0.11
10 yr 1 hr	N-DP-A09x	4.77	4.67	-0.1
10 yr 1 hr	N-DP-A10	4.76	4.65	-0.11
10 yr 1 hr	N-DP-A11x	4.76	4.66	-0.1
10 yr 1 hr	N-DP-B2	4.35	4.42	0.07
10 yr 1 hr	N-DP-C02	4.37	4.4	0.03
10 yr 1 hr	N-DP-C03	3.36	4.42	1.06
10 yr 1 hr	N-DP-C03x	4.37	4.4	0.03
10 yr 1 hr	N-DP-D02	4.43	4.42	-0.01
10 yr 1 hr	N-DP-D03x	4.82	4.85	0.03
10 yr 1 hr	N-DP-D04	4.59	4.6	0.01
10 yr 1 hr	N-DP-D05x	4.64	4.68	0.04
10 yr 1 hr	N-DP-D06x	4.71	4.82	0.11
10 yr 1 hr	N-DP-D07x	4.81	4.88	0.07
10 yr 1 hr	N-DP-D08x	4.89	4.93	0.04
10 yr 1 hr	N-DP-D09	5.01	5.02	0.01
10 yr 1 hr	N-DP-D10	5.4	5.41	0.01
10 yr 1 hr	N-DP-E05	4.74	4.67	-0.07
10 yr 1 hr	N-DP-E06	4.86	4.86	0
10 yr 1 hr	N-DP-E08	4.78	4.7	-0.08
10 yr 1 hr	N-DP-F07	5.1	5.08	-0.02
10 yr 1 hr	N-DP-F08	4.94	4.94	0
10 yr 1 hr	N-DP-F09	4.96	5.04	0.08
10 yr 1 hr	N-DP-G05	4.36	4.44	0.08
10 yr 1 hr	N-DP-G06	4.36	4.45	0.09
10 yr 1 hr	N-DP-G07	4.36	4.47	0.11

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DP-G07x	4.35	4.45	0.1
10 yr 1 hr	N-DP-G08	4.39	4.57	0.18
10 yr 1 hr	N-DP-G08x	4.36	4.47	0.11
10 yr 1 hr	N-DP-H04	4.36	4.43	0.07
10 yr 1 hr	N-DP-H05	4.36	4.43	0.07
10 yr 1 hr	N-DP-H05x	4.36	4.43	0.07
10 yr 1 hr	N-DP-H06	4.35	4.44	0.09
10 yr 1 hr	N-DP-H06x	4.36	4.44	0.08
10 yr 1 hr	N-DP-K07	4.36	4.44	0.08
10 yr 1 hr	N-DP-M10	5.11	5.07	-0.04
10 yr 1 hr	N-DP-M11	5.2	5.07	-0.13
10 yr 1 hr	N-DP-M12	5.25	5.2	-0.05
10 yr 1 hr	N-DP-N10	4.89	4.96	0.07
10 yr 1 hr	N-DP-O10	4.77	4.67	-0.1
10 yr 1 hr	N-DP-O11	4.88	4.76	-0.12
10 yr 1 hr	N-DP-P06	4.6	4.65	0.05
10 yr 1 hr	N-DP-Y03	5.11	5.12	0.01
10 yr 1 hr	N-DP-Z12	4.26	4.51	0.25
10 yr 1 hr	N-DQ-A01	4.33	4.44	0.11
10 yr 1 hr	N-DQ-A02	4.34	4.44	0.1
10 yr 1 hr	N-DQ-A03	4.33	4.44	0.11
10 yr 1 hr	N-DQ-A03x	2.94	4.41	1.47
10 yr 1 hr	N-DQ-A04	5.32	5.6	0.28
10 yr 1 hr	N-DQ-A05	4.03	4.42	0.39
10 yr 1 hr	N-DQ-A06	4.33	4.44	0.11
10 yr 1 hr	N-DQ-A07	4.33	4.44	0.11
10 yr 1 hr	N-DQ-A08	4.33	4.44	0.11
10 yr 1 hr	N-E01	2.9	4.4	1.5
10 yr 1 hr	N-E02	3.35	4.4	1.05
10 yr 1 hr	N-E03	4	4.4	0.4
10 yr 1 hr	N-E07	4.49	4.53	0.04
10 yr 1 hr	N-E08	3.78	4.4	0.62
10 yr 1 hr	N-E10	3.71	4.4	0.69
10 yr 1 hr	N-E11	1.83	4.4	2.57
10 yr 1 hr	N-EA	1.59	4.4	2.81
10 yr 1 hr	N-EA-A01	3.81	4.41	0.6
10 yr 1 hr	N-EA-A02	3.81	4.41	0.6
10 yr 1 hr	N-EB	1.59	4.4	2.81
10 yr 1 hr	N-EB-A01	2.52	4.4	1.88
10 yr 1 hr	N-EC	1.59	4.4	2.81
10 yr 1 hr	N-EC-A01	2.69	4.4	1.71
10 yr 1 hr	N-ED	1.59	4.4	2.81
10 yr 1 hr	N-ED-A01	3.24	4.41	1.17
10 yr 1 hr	N-ED-A02	3.41	4.4	0.99

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Area BCDE Improvement Alternatives Future Condition Tailwater Unselected Alternative (3BCD,2E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-ED-A03	3.51	4.4	0.89
10 yr 1 hr	N-EE	1.59	4.4	2.81
10 yr 1 hr	N-EE-A01	3.66	4.4	0.74
10 yr 1 hr	N-EF	1.59	4.4	2.81
10 yr 1 hr	N-EF-A01	3.11	4.4	1.29
10 yr 1 hr	N-EG	1.59	4.4	2.81
10 yr 1 hr	N-EG-A01	3.43	4.4	0.97
10 yr 1 hr	N-EG-A02	3.62	4.4	0.78
10 yr 1 hr	N-EH	1.59	4.4	2.81
10 yr 1 hr	N-EH-A01	1.77	4.4	2.63
10 yr 1 hr	N-EI	1.59	4.4	2.81
10 yr 1 hr	N-EJ	1.59	4.4	2.81
10 yr 1 hr	N-EJ-A01	1.61	4.4	2.79
10 yr 1 hr	N-EK	1.59	4.4	2.81
10 yr 1 hr	N-EK-A01	3.68	4.4	0.72
10 yr 1 hr	N-EL	1.59	4.4	2.81
10 yr 1 hr	N-EL-A01	3.01	4.4	1.39
10 yr 1 hr	N-EM	1.59	4.4	2.81
10 yr 1 hr	N-EM-A01	2.63	4.4	1.77
10 yr 1 hr	N-EM-A02	2.61	4.4	1.79
10 yr 1 hr	N-EM-A03	2	4.4	2.4
10 yr 1 hr	N-EN	1.59	4.4	2.81
10 yr 1 hr	N-EN-A01	2.83	4.4	1.57
10 yr 1 hr	N-EO	1.59	4.4	2.81
10 yr 1 hr	N-EO-A01	2.22	4.4	2.18
10 yr 1 hr	N-EP	1.59	4.4	2.81
10 yr 1 hr	N-EP-A01	1.98	4.4	2.42
10 yr 1 hr	N-EQ	1.59	4.4	2.81
10 yr 1 hr	N-EQ-A01	1.65	4.41	2.76
10 yr 1 hr	N-ER	1.59	4.4	2.81
10 yr 1 hr	N-ES	1.59	4.4	2.81
10 yr 1 hr	N-ET	1.59	4.4	2.81
10 yr 1 hr	N-ET-A01	1.59	4.4	2.81
10 yr 1 hr	NAltAdd_01	#N/A	4.4	#N/A
10 yr 1 hr	NZA-0110	#N/A	4.42	#N/A
10 yr 1 hr	NZA-0120	#N/A	4.41	#N/A
10 yr 1 hr	NZA-0130	#N/A	4.41	#N/A
10 yr 1 hr	NZA-0150	#N/A	4.42	#N/A
10 yr 1 hr	NZA-0160	#N/A	4.41	#N/A
10 yr 1 hr	Trunkline-Junction-1	#N/A	4.42	#N/A

Kimley»Horn

Area BCDE Improvement Projects Unselected Alternative with Future Conditions Tailwater(3BCD,2E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	9thSt-Node	#N/A	4.42	#N/A
25 yr 72 hr	N-BA	1.59	4.4	2.81
25 yr 72 hr	N-BA-A01	3.55	4.42	0.87
25 yr 72 hr	N-BA-A02	3.6	4.44	0.84
25 yr 72 hr	N-BA-A03	3.64	4.44	0.8
25 yr 72 hr	N-BA-A03x	3.6	4.44	0.84
25 yr 72 hr	N-BA-A04	3.71	4.46	0.75
25 yr 72 hr	N-BA-A04x	3.63	4.45	0.82
25 yr 72 hr	N-BA-A05	3.72	4.46	0.74
25 yr 72 hr	N-BA-A06	3.78	4.47	0.69
25 yr 72 hr	N-BA-A07	3.82	4.47	0.65
25 yr 72 hr	N-BA-A07x	3.81	4.47	0.66
25 yr 72 hr	N-BA-A08	3.83	4.48	0.65
25 yr 72 hr	N-BA-A08x	3.82	4.48	0.66
25 yr 72 hr	N-BA-A09	4.01	4.75	0.74
25 yr 72 hr	N-BA-B02	3.41	4.41	1
25 yr 72 hr	N-BA-B03	3.41	4.41	1
25 yr 72 hr	N-BA-B04	3.39	4.41	1.02
25 yr 72 hr	N-BA-C03	3.57	4.43	0.86
25 yr 72 hr	N-BA-C04	3.57	4.43	0.86
25 yr 72 hr	N-BA-D05	3.73	4.46	0.73
25 yr 72 hr	N-BA-D06	3.75	4.47	0.72
25 yr 72 hr	N-BA-D07	3.85	4.48	0.63
25 yr 72 hr	N-BA-D08	3.89	4.48	0.59
25 yr 72 hr	N-BA-E09	3.83	4.48	0.65
25 yr 72 hr	N-BA-F09	3.88	4.47	0.59
25 yr 72 hr	N-BA-K04	3.69	4.46	0.77
25 yr 72 hr	N-BA-K05	3.72	4.47	0.75
25 yr 72 hr	N-BA-K06	3.78	4.47	0.69
25 yr 72 hr	N-BA-K08	5.08	5.1	0.02
25 yr 72 hr	N-BA-L06	3.76	4.47	0.71
25 yr 72 hr	N-BA-Q05	3.67	4.45	0.78
25 yr 72 hr	N-BA-Q06	3.66	4.45	0.79
25 yr 72 hr	N-BA-Q06x	3.67	4.45	0.78
25 yr 72 hr	N-BA-Q07	3.68	4.45	0.77
25 yr 72 hr	N-BA-Q07x	3.66	4.44	0.78
25 yr 72 hr	N-BA-Q08	3.68	4.45	0.77
25 yr 72 hr	N-BA-R06	3.69	4.46	0.77
25 yr 72 hr	N-BA-R07	3.68	4.45	0.77
25 yr 72 hr	N-BA-R07x	3.7	4.46	0.76
25 yr 72 hr	N-BA-R08	3.66	4.45	0.79
25 yr 72 hr	N-BA-R08x	3.68	4.45	0.77
25 yr 72 hr	N-BA-R09	3.67	4.45	0.78
25 yr 72 hr	N-BA-R10	3.67	4.45	0.78

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA-R11	3.65	4.44	0.79
25 yr 72 hr	N-BA-S06a	3.94	4.48	0.54
25 yr 72 hr	N-BA-T07	3.73	4.46	0.73
25 yr 72 hr	N-BA-T08	3.72	4.46	0.74
25 yr 72 hr	N-BA-T08x	3.73	4.46	0.73
25 yr 72 hr	N-BA-T09	3.69	4.46	0.77
25 yr 72 hr	N-BA-T09x	3.71	4.46	0.75
25 yr 72 hr	N-BA-T10	3.69	4.46	0.77
25 yr 72 hr	N-BA-U02	3.55	4.43	0.88
25 yr 72 hr	N-BA-U03	3.56	4.43	0.87
25 yr 72 hr	N-BA-V07	3.8	4.46	0.66
25 yr 72 hr	N-BA-W08	4.54	4.65	0.11
25 yr 72 hr	N-BA-W09A	4.55	4.67	0.12
25 yr 72 hr	N-BA-W09B	4.51	4.62	0.11
25 yr 72 hr	N-BB	1.59	4.4	2.81
25 yr 72 hr	N-BB-A01	3.6	4.43	0.83
25 yr 72 hr	N-BB-A02	3.59	4.43	0.84
25 yr 72 hr	N-BB-A03	3.57	4.42	0.85
25 yr 72 hr	N-BB-A04	3.58	4.43	0.85
25 yr 72 hr	N-BC	1.59	4.4	2.81
25 yr 72 hr	N-BC-A01	2.54	4.41	1.87
25 yr 72 hr	N-BC-A02	4.82	4.77	-0.05
25 yr 72 hr	N-BD	1.59	4.4	2.81
25 yr 72 hr	N-BD-A01	3.59	4.42	0.83
25 yr 72 hr	N-BD-A02	3.64	4.44	0.8
25 yr 72 hr	N-BD-A02x	3.65	4.44	0.79
25 yr 72 hr	N-BD-A03	3.65	4.44	0.79
25 yr 72 hr	N-BD-A05	3.64	4.44	0.8
25 yr 72 hr	N-BD-B02	3.59	4.42	0.83
25 yr 72 hr	N-BD-B03	3.57	4.42	0.85
25 yr 72 hr	N-BD-B04	3.64	4.42	0.78
25 yr 72 hr	N-BD-B04x	3.57	4.42	0.85
25 yr 72 hr	N-BE	1.59	4.4	2.81
25 yr 72 hr	N-BE-A01	3.56	4.42	0.86
25 yr 72 hr	N-BE-A03	3.68	4.45	0.77
25 yr 72 hr	N-BE-A04	3.68	4.45	0.77
25 yr 72 hr	N-BF	1.59	4.4	2.81
25 yr 72 hr	N-BF-A01	4.06	4.51	0.45
25 yr 72 hr	N-CA	1.59	4.4	2.81
25 yr 72 hr	N-CA-A01c	5.81	4.47	-1.34
25 yr 72 hr	N-CA-A01d	3.45	4.4	0.95
25 yr 72 hr	N-CA-A02	3.58	4.42	0.84
25 yr 72 hr	N-CA-A03	3.59	4.42	0.83
25 yr 72 hr	N-CA-A04	3.6	4.43	0.83

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-A05	3.6	4.44	0.84
25 yr 72 hr	N-CA-A07	5.04	5.14	0.1
25 yr 72 hr	N-CA-B03	3.59	4.42	0.83
25 yr 72 hr	N-CA-B04	3.6	4.43	0.83
25 yr 72 hr	N-CA-B07	4.7	5.03	0.33
25 yr 72 hr	N-CA-C03	3.38	4.41	1.03
25 yr 72 hr	N-CA-C04	3.35	4.41	1.06
25 yr 72 hr	N-CA-C05	3.39	4.41	1.02
25 yr 72 hr	N-CA-D06	3.64	4.44	0.8
25 yr 72 hr	N-CA-D07	3.65	4.43	0.78
25 yr 72 hr	N-CA-D07x	3.81	4.44	0.63
25 yr 72 hr	N-CA-D08	3.4	4.43	1.03
25 yr 72 hr	N-CA-D08x	3.66	4.44	0.78
25 yr 72 hr	N-CA-D09x	3.4	4.44	1.04
25 yr 72 hr	N-CA-E07	4.8	5.04	0.24
25 yr 72 hr	N-CA-E08	4.82	5.04	0.22
25 yr 72 hr	N-CA-E09x	5.03	5.05	0.02
25 yr 72 hr	N-CA-F04	3.56	4.43	0.87
25 yr 72 hr	N-CA-F05	3.36	4.42	1.06
25 yr 72 hr	N-CA-F05x	3.43	4.42	0.99
25 yr 72 hr	N-CA-F06	3.35	4.42	1.07
25 yr 72 hr	N-CA-F06x	3.33	4.42	1.09
25 yr 72 hr	N-CA-F07	3.34	4.42	1.08
25 yr 72 hr	N-CA-F07x	3.33	4.42	1.09
25 yr 72 hr	N-CA-F08	3.36	4.42	1.06
25 yr 72 hr	N-CA-F09	3.36	4.42	1.06
25 yr 72 hr	N-CA-F09x	3.36	4.42	1.06
25 yr 72 hr	N-CA-F10	3.37	4.42	1.05
25 yr 72 hr	N-CA-F11	3.37	4.42	1.05
25 yr 72 hr	N-CA-F11x	3.37	4.42	1.05
25 yr 72 hr	N-CA-F12	3.37	4.41	1.04
25 yr 72 hr	N-CA-F12x	3.37	4.42	1.05
25 yr 72 hr	N-CA-G08	3.37	4.43	1.06
25 yr 72 hr	N-CA-G09	3.38	4.43	1.05
25 yr 72 hr	N-CA-G10	3.58	4.43	0.85
25 yr 72 hr	N-CA-G11x	3.56	4.43	0.87
25 yr 72 hr	N-CA-H09	3.38	4.43	1.05
25 yr 72 hr	N-CA-H10	3.38	4.43	1.05
25 yr 72 hr	N-CA-H10x	3.37	4.42	1.05
25 yr 72 hr	N-CA-H11	3.39	4.43	1.04
25 yr 72 hr	N-CA-H11x	3.38	4.42	1.04
25 yr 72 hr	N-CA-H12	3.39	4.43	1.04
25 yr 72 hr	N-CA-H13	3.4	4.43	1.03
25 yr 72 hr	N-CA-H14	3.41	4.44	1.03

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-I12	3.39	4.43	1.04
25 yr 72 hr	N-CA-I13	3.39	4.43	1.04
25 yr 72 hr	N-CA-I14	3.39	4.43	1.04
25 yr 72 hr	N-CA-J14	3.4	4.43	1.03
25 yr 72 hr	N-CA-J15x	3.4	4.43	1.03
25 yr 72 hr	N-CA-K03	3.62	4.44	0.82
25 yr 72 hr	N-CA-L04	3.6	4.43	0.83
25 yr 72 hr	N-CA-L05	3.73	4.45	0.72
25 yr 72 hr	N-CA-M06	3.77	4.46	0.69
25 yr 72 hr	N-CA-N05	3.66	4.44	0.78
25 yr 72 hr	N-CA-O08	4.98	5.02	0.04
25 yr 72 hr	N-CA-S05	3.41	4.42	1.01
25 yr 72 hr	N-CA-T08	3.32	4.42	1.1
25 yr 72 hr	N-CA-T09	3.32	4.42	1.1
25 yr 72 hr	N-CB	1.59	4.4	2.81
25 yr 72 hr	N-CB-A01	3.19	4.4	1.21
25 yr 72 hr	N-CB-Added	#N/A	4.4	#N/A
25 yr 72 hr	N-CC	1.59	4.4	2.81
25 yr 72 hr	N-CC-A01	3.15	4.4	1.25
25 yr 72 hr	N-CC-A02	3.18	4.41	1.23
25 yr 72 hr	N-CC-A03	3.31	4.41	1.1
25 yr 72 hr	N-CE	1.59	4.4	2.81
25 yr 72 hr	N-CE-A01	3.37	4.42	1.05
25 yr 72 hr	N-CE-A02	3.37	4.42	1.05
25 yr 72 hr	N-CE-A03	3.37	4.42	1.05
25 yr 72 hr	N-CF	1.59	4.4	2.81
25 yr 72 hr	N-CF-A01	3.38	4.42	1.04
25 yr 72 hr	N-CF-A02	3.38	4.42	1.04
25 yr 72 hr	N-CF-A03x	3.38	4.42	1.04
25 yr 72 hr	N-CG	1.59	4.4	2.81
25 yr 72 hr	N-CG-A01	3.38	4.42	1.04
25 yr 72 hr	N-CG-A02x	3.39	4.42	1.03
25 yr 72 hr	N-CG-A03x	3.39	4.42	1.03
25 yr 72 hr	N-CH	1.59	4.4	2.81
25 yr 72 hr	N-CH-A01b	1.88	4.4	2.52
25 yr 72 hr	N-CH-A02	2.75	4.4	1.65
25 yr 72 hr	N-CH-A03	3.93	4.41	0.48
25 yr 72 hr	N-CH-A04	4.03	4.43	0.4
25 yr 72 hr	N-CH-Added	#N/A	4.4	#N/A
25 yr 72 hr	N-CH-B02	2.96	4.41	1.45
25 yr 72 hr	N-CH-B03	3.9	4.44	0.54
25 yr 72 hr	N-CH-B03x	3.08	4.41	1.33
25 yr 72 hr	N-CH-B04	3.94	4.44	0.5
25 yr 72 hr	N-CH-B04x	4.12	4.47	0.35

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CH-B05	4.75	4.75	0
25 yr 72 hr	N-CH-B05x	4.05	4.48	0.43
25 yr 72 hr	N-CH-B06	4.88	4.89	0.01
25 yr 72 hr	N-CH-B06x	4.83	4.83	0
25 yr 72 hr	N-CH-B07	5.93	5.94	0.01
25 yr 72 hr	N-CH-C04	4.02	4.43	0.41
25 yr 72 hr	N-CH-C05	4.04	4.44	0.4
25 yr 72 hr	N-CH-C05x1	4.03	4.43	0.4
25 yr 72 hr	N-CH-C05x2	4.03	4.43	0.4
25 yr 72 hr	N-CH-C05x3	4.03	4.43	0.4
25 yr 72 hr	N-CH-C06	4.04	4.45	0.41
25 yr 72 hr	N-CH-C06x	4.04	4.44	0.4
25 yr 72 hr	N-CH-C07x	4.04	4.45	0.41
25 yr 72 hr	N-CH-D05	4.03	4.43	0.4
25 yr 72 hr	N-CH-D06	4.03	4.43	0.4
25 yr 72 hr	N-CH-D08x	4.04	4.43	0.39
25 yr 72 hr	N-CH-E06	4.04	4.44	0.4
25 yr 72 hr	N-CH-E07	4.04	4.44	0.4
25 yr 72 hr	N-CH-F07	4.05	4.45	0.4
25 yr 72 hr	N-CH-F08	4.05	4.45	0.4
25 yr 72 hr	N-CH-G07	4.03	4.43	0.4
25 yr 72 hr	N-CH-G08	4.03	4.42	0.39
25 yr 72 hr	N-CH-G09	4.02	4.42	0.4
25 yr 72 hr	N-CH-G10	4.02	4.42	0.4
25 yr 72 hr	N-CH-G11	4.03	4.42	0.39
25 yr 72 hr	N-CH-I04	3.99	4.42	0.43
25 yr 72 hr	N-CH-I05x1	4.02	4.42	0.4
25 yr 72 hr	N-CH-I05x2	4.01	4.42	0.41
25 yr 72 hr	N-CH-I05x3	4.01	4.42	0.41
25 yr 72 hr	N-CH-I05x4	4.02	4.42	0.4
25 yr 72 hr	N-CI	1.59	4.4	2.81
25 yr 72 hr	N-D10	4.03	4.43	0.4
25 yr 72 hr	N-D16	2.55	4.4	1.85
25 yr 72 hr	N-D19	4.89	4.73	-0.16
25 yr 72 hr	N-D20	4.89	4.7	-0.19
25 yr 72 hr	N-D22	4.86	4.85	-0.01
25 yr 72 hr	N-D30	4.87	4.67	-0.2
25 yr 72 hr	N-DA	1.59	4.4	2.81
25 yr 72 hr	N-DA-A01	3.76	4.42	0.66
25 yr 72 hr	N-DB	1.59	4.4	2.81
25 yr 72 hr	N-DC	1.59	4.4	2.81
25 yr 72 hr	N-DI-A01	3.98	4.43	0.45
25 yr 72 hr	N-DI-A02	4.02	4.44	0.42
25 yr 72 hr	N-DI-B04	4.51	4.48	-0.03

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DI-B05	4.32	4.47	0.15
25 yr 72 hr	N-DI-B05x	4.83	4.62	-0.21
25 yr 72 hr	N-DI-B06	4.33	4.48	0.15
25 yr 72 hr	N-DI-B07	4.83	4.56	-0.27
25 yr 72 hr	N-DI-B08	4.83	4.59	-0.24
25 yr 72 hr	N-DI-B09	4.85	4.62	-0.23
25 yr 72 hr	N-DI-B10	4.87	4.66	-0.21
25 yr 72 hr	N-DI-B10x	4.85	4.62	-0.23
25 yr 72 hr	N-DI-B11	4.86	4.65	-0.21
25 yr 72 hr	N-DI-C03	4.09	4.46	0.37
25 yr 72 hr	N-DI-C04	4.86	4.85	-0.01
25 yr 72 hr	N-DI-C05	4.76	4.6	-0.16
25 yr 72 hr	N-DP	4.39	4.4	0.01
25 yr 72 hr	N-DP-A01	4.54	4.4	-0.14
25 yr 72 hr	N-DP-A02	4.59	4.45	-0.14
25 yr 72 hr	N-DP-A04	4.62	4.47	-0.15
25 yr 72 hr	N-DP-A07	4.89	4.7	-0.19
25 yr 72 hr	N-DP-A08	4.89	4.7	-0.19
25 yr 72 hr	N-DP-A09	4.88	4.68	-0.2
25 yr 72 hr	N-DP-A09x	4.89	4.7	-0.19
25 yr 72 hr	N-DP-A10	4.88	4.68	-0.2
25 yr 72 hr	N-DP-A11x	4.88	4.69	-0.19
25 yr 72 hr	N-DP-B2	4.57	4.44	-0.13
25 yr 72 hr	N-DP-C02	4.59	4.4	-0.19
25 yr 72 hr	N-DP-C03	3.76	4.43	0.67
25 yr 72 hr	N-DP-C03x	4.59	4.4	-0.19
25 yr 72 hr	N-DP-D02	4.64	4.46	-0.18
25 yr 72 hr	N-DP-D03x	4.87	4.85	-0.02
25 yr 72 hr	N-DP-D04	4.85	4.7	-0.15
25 yr 72 hr	N-DP-D05x	4.88	4.77	-0.11
25 yr 72 hr	N-DP-D06x	4.94	4.92	-0.02
25 yr 72 hr	N-DP-D07x	5.03	5	-0.03
25 yr 72 hr	N-DP-D08x	5.1	5.05	-0.05
25 yr 72 hr	N-DP-D09	5.19	5.13	-0.06
25 yr 72 hr	N-DP-D10	5.55	5.52	-0.03
25 yr 72 hr	N-DP-E05	4.89	4.76	-0.13
25 yr 72 hr	N-DP-E06	4.92	4.91	-0.01
25 yr 72 hr	N-DP-E08	4.89	4.73	-0.16
25 yr 72 hr	N-DP-F07	5.89	5.86	-0.03
25 yr 72 hr	N-DP-F08	5.13	5.05	-0.08
25 yr 72 hr	N-DP-F09	5.37	5.23	-0.14
25 yr 72 hr	N-DP-G05	4.58	4.46	-0.12
25 yr 72 hr	N-DP-G06	4.58	4.47	-0.11
25 yr 72 hr	N-DP-G07	4.58	4.49	-0.09

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DP-G07x	4.57	4.47	-0.1
25 yr 72 hr	N-DP-G08	4.62	4.62	0
25 yr 72 hr	N-DP-G08x	4.58	4.49	-0.09
25 yr 72 hr	N-DP-H04	4.58	4.45	-0.13
25 yr 72 hr	N-DP-H05	4.58	4.45	-0.13
25 yr 72 hr	N-DP-H05x	4.58	4.45	-0.13
25 yr 72 hr	N-DP-H06	4.57	4.46	-0.11
25 yr 72 hr	N-DP-H06x	4.58	4.46	-0.12
25 yr 72 hr	N-DP-K07	4.58	4.46	-0.12
25 yr 72 hr	N-DP-M10	5.26	5.18	-0.08
25 yr 72 hr	N-DP-M11	5.31	5.18	-0.13
25 yr 72 hr	N-DP-M12	5.38	5.3	-0.08
25 yr 72 hr	N-DP-N10	5.12	5.08	-0.04
25 yr 72 hr	N-DP-O10	4.88	4.69	-0.19
25 yr 72 hr	N-DP-O11	4.89	4.79	-0.1
25 yr 72 hr	N-DP-P06	4.64	4.65	0.01
25 yr 72 hr	N-DP-Y03	5.12	5.12	0
25 yr 72 hr	N-DP-Z12	4.4	4.55	0.15
25 yr 72 hr	N-DQ-A01	4.55	4.45	-0.1
25 yr 72 hr	N-DQ-A02	4.56	4.46	-0.1
25 yr 72 hr	N-DQ-A03	4.55	4.45	-0.1
25 yr 72 hr	N-DQ-A03x	3.13	4.42	1.29
25 yr 72 hr	N-DQ-A04	5.57	5.68	0.11
25 yr 72 hr	N-DQ-A05	4.36	4.42	0.06
25 yr 72 hr	N-DQ-A06	4.55	4.46	-0.09
25 yr 72 hr	N-DQ-A07	4.55	4.45	-0.1
25 yr 72 hr	N-DQ-A08	4.55	4.46	-0.09
25 yr 72 hr	N-E01	2.93	4.4	1.47
25 yr 72 hr	N-E02	3.39	4.4	1.01
25 yr 72 hr	N-E03	4.02	4.4	0.38
25 yr 72 hr	N-E07	4.54	4.54	0
25 yr 72 hr	N-E08	3.82	4.4	0.58
25 yr 72 hr	N-E10	3.74	4.4	0.66
25 yr 72 hr	N-E11	2.57	4.4	1.83
25 yr 72 hr	N-EA	1.59	4.4	2.81
25 yr 72 hr	N-EA-A01	3.86	4.41	0.55
25 yr 72 hr	N-EA-A02	3.86	4.41	0.55
25 yr 72 hr	N-EB	1.59	4.4	2.81
25 yr 72 hr	N-EB-A01	3.03	4.4	1.37
25 yr 72 hr	N-EC	1.59	4.4	2.81
25 yr 72 hr	N-EC-A01	3.11	4.4	1.29
25 yr 72 hr	N-ED	1.59	4.4	2.81
25 yr 72 hr	N-ED-A01	3.63	4.41	0.78
25 yr 72 hr	N-ED-A02	3.64	4.4	0.76

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-ED-A03	3.64	4.41	0.77
25 yr 72 hr	N-EE	1.59	4.4	2.81
25 yr 72 hr	N-EE-A01	3.71	4.41	0.7
25 yr 72 hr	N-EF	1.59	4.4	2.81
25 yr 72 hr	N-EF-A01	3.71	4.4	0.69
25 yr 72 hr	N-EG	1.59	4.4	2.81
25 yr 72 hr	N-EG-A01	3.46	4.4	0.94
25 yr 72 hr	N-EG-A02	3.66	4.4	0.74
25 yr 72 hr	N-EH	1.59	4.4	2.81
25 yr 72 hr	N-EH-A01	2.02	4.4	2.38
25 yr 72 hr	N-EI	1.59	4.4	2.81
25 yr 72 hr	N-EJ	1.59	4.4	2.81
25 yr 72 hr	N-EJ-A01	1.65	4.4	2.75
25 yr 72 hr	N-EK	1.59	4.4	2.81
25 yr 72 hr	N-EK-A01	3.76	4.4	0.64
25 yr 72 hr	N-EL	1.59	4.4	2.81
25 yr 72 hr	N-EL-A01	3.04	4.4	1.36
25 yr 72 hr	N-EM	1.59	4.4	2.81
25 yr 72 hr	N-EM-A01	2.83	4.4	1.57
25 yr 72 hr	N-EM-A02	2.74	4.4	1.66
25 yr 72 hr	N-EM-A03	2.57	4.4	1.83
25 yr 72 hr	N-EN	1.59	4.4	2.81
25 yr 72 hr	N-EN-A01	2.92	4.4	1.48
25 yr 72 hr	N-EO	1.59	4.4	2.81
25 yr 72 hr	N-EO-A01	2.46	4.4	1.94
25 yr 72 hr	N-EP	1.59	4.4	2.81
25 yr 72 hr	N-EP-A01	2.56	4.4	1.84
25 yr 72 hr	N-EQ	1.59	4.4	2.81
25 yr 72 hr	N-EQ-A01	1.67	4.42	2.75
25 yr 72 hr	N-ER	1.59	4.4	2.81
25 yr 72 hr	N-ES	1.59	4.4	2.81
25 yr 72 hr	N-ET	1.59	4.4	2.81
25 yr 72 hr	N-ET-A01	1.6	4.4	2.8
25 yr 72 hr	NAltAdd_01	#N/A	4.4	#N/A
25 yr 72 hr	NZA-0110	#N/A	4.42	#N/A
25 yr 72 hr	NZA-0120	#N/A	4.41	#N/A
25 yr 72 hr	NZA-0130	#N/A	4.41	#N/A
25 yr 72 hr	NZA-0150	#N/A	4.42	#N/A
25 yr 72 hr	NZA-0160	#N/A	4.41	#N/A
25 yr 72 hr	Trunkline-Junction-1	#N/A	4.43	#N/A

Long-Range Resilient Alternatives

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	Added-8-DSJ	#N/A	-1	#N/A
10 YR 1 HR	Added-Junction-1	#N/A	5.79	#N/A
10 YR 1 HR	N-ABA	1.59	4.4	2.81
10 YR 1 HR	N-ABA-A01	3.66	1.22	-2.44
10 YR 1 HR	N-ABA-A02	3.83	-0.06	-3.89
10 YR 1 HR	N-ABB	1.59	4.4	2.81
10 YR 1 HR	N-ABB-A01	3.57	-1.47	-5.04
10 YR 1 HR	N-ABB-A02	4.23	0.48	-3.75
10 YR 1 HR	N-ABB-A03	4.23	0.68	-3.55
10 YR 1 HR	N-ABB-A04	4.23	0.75	-3.48
10 YR 1 HR	N-ABB-B02	4.25	-0.52	-4.77
10 YR 1 HR	N-ABB-B03	4.27	0.32	-3.95
10 YR 1 HR	N-ABB-B03x	4.28	-0.4	-4.68
10 YR 1 HR	N-ABB-B04	4.28	0.93	-3.35
10 YR 1 HR	N-ABC	1.59	4.4	2.81
10 YR 1 HR	N-ABC-A01	4.21	3.28	-0.93
10 YR 1 HR	N-ABC-A02	4.22	3.39	-0.83
10 YR 1 HR	N-ABC-B02	4.21	3.32	-0.89
10 YR 1 HR	N-ABD	1.59	4.4	2.81
10 YR 1 HR	N-ABD-A01	3.33	3.16	-0.17
10 YR 1 HR	N-ABD-A02	4.06	3.43	-0.63
10 YR 1 HR	N-ABD-A02x	3.76	3.24	-0.52
10 YR 1 HR	N-ABD-A03	4.64	3.74	-0.9
10 YR 1 HR	N-ABD-A03x	4.11	3.64	-0.47
10 YR 1 HR	N-ABD-A04	4.95	3.75	-1.2
10 YR 1 HR	N-ABD-A05	5.18	3.74	-1.44
10 YR 1 HR	N-ABD-A06	5.19	2.7	-2.49
10 YR 1 HR	N-ABD-A07	5.19	2.71	-2.48
10 YR 1 HR	N-ABD-B04	5.43	4.04	-1.39
10 YR 1 HR	N-ABD-B05	5.52	4.2	-1.32
10 YR 1 HR	N-ABD-B05x	5.43	4.05	-1.38
10 YR 1 HR	N-ABD-B06	5.53	4.24	-1.29
10 YR 1 HR	N-ABD-B07	6.17	4.95	-1.22
10 YR 1 HR	N-ABD-B08	7.41	7.41	0
10 YR 1 HR	N-ABE	1.59	4.4	2.81
10 YR 1 HR	N-ABE-A01	2.05	3.32	1.27
10 YR 1 HR	N-ABE-A02	2.68	3.81	1.13
10 YR 1 HR	N-ABF	1.59	4.4	2.81
10 YR 1 HR	N-ABF-A01	4.11	3.6	-0.51
10 YR 1 HR	N-ABF-A02	4.11	3.62	-0.49
10 YR 1 HR	N-ABG	1.59	4.4	2.81
10 YR 1 HR	N-ABG-A01	4.53	2.79	-1.74
10 YR 1 HR	N-ABG-A02	4.76	2.58	-2.18
10 YR 1 HR	N-ABG-A03	4.79	2.51	-2.28

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ABH	1.59	4.4	2.81
10 YR 1 HR	N-ABH-A01	4.07	1.79	-2.28
10 YR 1 HR	N-ABH-A02	4.98	1.41	-3.57
10 YR 1 HR	N-ABH-A03	4.98	3.32	-1.66
10 YR 1 HR	N-ABH-A03x	4.98	3.22	-1.76
10 YR 1 HR	N-ABH-B02	5.02	2.14	-2.88
10 YR 1 HR	N-ABH-B03	5.03	2.32	-2.71
10 YR 1 HR	N-ABH-B03x	5.03	4.19	-0.84
10 YR 1 HR	N-ABH-B04	5.04	2.33	-2.71
10 YR 1 HR	N-ABI	1.59	4.4	2.81
10 YR 1 HR	N-ABI-A01	4.93	3.72	-1.21
10 YR 1 HR	N-ABI-A02	4.93	1.6	-3.33
10 YR 1 HR	N-ABJ	1.59	4.4	2.81
10 YR 1 HR	N-ABJ-A01	4.95	3.37	-1.58
10 YR 1 HR	N-ABJ-A02	4.95	1.57	-3.38
10 YR 1 HR	N-ABK	1.59	4.4	2.81
10 YR 1 HR	N-ABK-A01	3.71	3.99	0.28
10 YR 1 HR	N-ABK-A02x1	5.66	5.5	-0.16
10 YR 1 HR	N-ABK-A02x2	5.67	5.53	-0.14
10 YR 1 HR	N-ABK-B02	4.99	4.26	-0.73
10 YR 1 HR	N-ABK-B03	4.99	4.29	-0.7
10 YR 1 HR	N-ABK-B04	7.48	5.61	-1.87
10 YR 1 HR	N-ABL	1.59	4.4	2.81
10 YR 1 HR	N-ABL-A01	3.41	4.38	0.97
10 YR 1 HR	N-ABL-A02	4.33	4.4	0.07
10 YR 1 HR	N-ABM	1.59	4.4	2.81
10 YR 1 HR	N-ABM-A01	4.74	4.43	-0.31
10 YR 1 HR	N-ABM-A02	4.74	4.45	-0.29
10 YR 1 HR	N-ABN	1.59	4.4	2.81
10 YR 1 HR	N-ABN-A01	9.68	9.51	-0.17
10 YR 1 HR	N-ABO	1.59	4.4	2.81
10 YR 1 HR	N-ABO-A01	3.81	3.5	-0.31
10 YR 1 HR	N-ABO-A02	5.2	5.44	0.24
10 YR 1 HR	N-ABP	1.59	4.4	2.81
10 YR 1 HR	N-ABQ	1.59	4.4	2.81
10 YR 1 HR	N-ADA-A01	6.1	5.58	-0.52
10 YR 1 HR	N-ADA-A02	6.92	5.73	-1.19
10 YR 1 HR	N-ADA-A03	6.93	5.82	-1.11
10 YR 1 HR	N-ADA-A03x	6.92	5.73	-1.19
10 YR 1 HR	N-ADA-A04	6.94	5.87	-1.07
10 YR 1 HR	N-ADA-A05	6.94	5.88	-1.06
10 YR 1 HR	N-ADA-B02	6.57	5.59	-0.98
10 YR 1 HR	N-ADA-B03	6.57	5.6	-0.97
10 YR 1 HR	N-ADA-B03x	6.57	5.6	-0.97

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADA-B04	7.22	5.6	-1.62
10 YR 1 HR	N-ADB-08	7.07	7.06	-0.01
10 YR 1 HR	N-ADB-A01	7.3	5.63	-1.67
10 YR 1 HR	N-ADB-A02	7.48	5.68	-1.8
10 YR 1 HR	N-ADB-A03	8.47	5.7	-2.77
10 YR 1 HR	N-ADB-A04	8.84	5.7	-3.14
10 YR 1 HR	N-ADB-A04x	8.76	5.7	-3.06
10 YR 1 HR	N-ADB-B03	7.49	5.84	-1.65
10 YR 1 HR	N-ADB-B04	8.83	6.34	-2.49
10 YR 1 HR	N-ADB-B05	8.86	7.98	-0.88
10 YR 1 HR	N-ADB-B06	9.16	9.09	-0.07
10 YR 1 HR	N-ADB-B07	9.7	9.53	-0.17
10 YR 1 HR	N-ADB-B07x	9.66	9.51	-0.15
10 YR 1 HR	N-ADC-A01	7.96	5.52	-2.44
10 YR 1 HR	N-ADC-A02	7.97	5.52	-2.45
10 YR 1 HR	N-ADD-A01	7.8	6.87	-0.93
10 YR 1 HR	N-ADD-A02	7.93	7.1	-0.83
10 YR 1 HR	N-ADD-A03	10.93	8.57	-2.36
10 YR 1 HR	N-ADD-A04	10.93	8.98	-1.95
10 YR 1 HR	N-ADD-A04x	10.93	8.57	-2.36
10 YR 1 HR	N-ADD-A05	10.98	9.62	-1.36
10 YR 1 HR	N-ADD-A06	10.99	10.25	-0.74
10 YR 1 HR	N-ADD-A07	12.51	11.17	-1.34
10 YR 1 HR	N-ADD-A08	12.53	11.51	-1.02
10 YR 1 HR	N-ADD-A09	12.59	11.77	-0.82
10 YR 1 HR	N-ADD-A10	12.59	12.02	-0.57
10 YR 1 HR	N-ADD-A11	12.64	12.32	-0.32
10 YR 1 HR	N-ADD-A12	13.08	12.63	-0.45
10 YR 1 HR	N-ADD-A13	13.36	13.03	-0.33
10 YR 1 HR	N-ADD-A14	13.37	13.04	-0.33
10 YR 1 HR	N-ADD-A15	13.35	13.02	-0.33
10 YR 1 HR	N-ADD-A16	13.25	13.02	-0.23
10 YR 1 HR	N-ADD-B03	7.95	7.14	-0.81
10 YR 1 HR	N-ADD-B05	11.67	11.67	0
10 YR 1 HR	N-ADD-C04	10.94	10.66	-0.28
10 YR 1 HR	N-ADD-C05	11.24	11.24	0
10 YR 1 HR	N-ADD-D08	12.01	11.55	-0.46
10 YR 1 HR	N-ADD-D09	11.87	11.71	-0.16
10 YR 1 HR	N-ADD-H04	10.93	10.42	-0.51
10 YR 1 HR	N-ADD-N13	12.88	12.64	-0.24
10 YR 1 HR	N-ADD-N14	13.15	12.73	-0.42
10 YR 1 HR	N-ADD-N15	12.55	12.69	0.14
10 YR 1 HR	N-ADE-A01	6.96	5.95	-1.01
10 YR 1 HR	N-ADE-A02	8.4	6.45	-1.95

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Area A Long Range Alternatives Selected
Alternative (1A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADE-A03	8.68	6.78	-1.9
10 YR 1 HR	N-ADE-A04	9.1	8.17	-0.93
10 YR 1 HR	N-ADE-A04x	8.7	6.78	-1.92
10 YR 1 HR	N-ADE-A05	10.84	10.84	0
10 YR 1 HR	N-ADE-A05x	9.1	8.19	-0.91
10 YR 1 HR	N-ADE-A06	11.2	11.2	0
10 YR 1 HR	N-ADE-B02	7.01	6	-1.01
10 YR 1 HR	N-ADE-B03	7.02	6.01	-1.01
10 YR 1 HR	N-ADE-C02	7.52	6.03	-1.49
10 YR 1 HR	N-ADE-C03	7.54	6.14	-1.4
10 YR 1 HR	N-ADE-D03	7	6.02	-0.98
10 YR 1 HR	N-ADS-A01	5.67	5.63	-0.04
10 YR 1 HR	N-ADS-A02	5.99	5.69	-0.3
10 YR 1 HR	N-ASA-A01	5.41	5.44	0.03
10 YR 1 HR	N-ASA-A02	5.41	5.44	0.03
10 YR 1 HR	N-ASA-A03	5.61	5.45	-0.16
10 YR 1 HR	N-ASA-A04	5.72	5.45	-0.27
10 YR 1 HR	N-ASA-A05	5.89	5.45	-0.44
10 YR 1 HR	N-ASA-A06	6.09	5.46	-0.63
10 YR 1 HR	N-ASA-A07	6.12	5.46	-0.66
10 YR 1 HR	N-ASB-A01	5.55	5.44	-0.11
10 YR 1 HR	N-ASB-A02	5.55	5.45	-0.1
10 YR 1 HR	N-ASB-B02	5.8	5.47	-0.33
10 YR 1 HR	N-ASC-A01	5.32	5.52	0.2
10 YR 1 HR	N-ASC-A02	5.99	5.68	-0.31
10 YR 1 HR	N-ASC-A03	6.24	5.69	-0.55
10 YR 1 HR	N-ASC-A04	6.5	5.71	-0.79
10 YR 1 HR	N-ASC-B02	5.61	5.53	-0.08
10 YR 1 HR	N-ASC-B03	5.65	5.53	-0.12
10 YR 1 HR	N-ASD-A01a	5.82	6.02	0.2
10 YR 1 HR	N-ASD-A02	8.07	8.11	0.04
10 YR 1 HR	N-ASD-A03	8.89	8.9	0.01
10 YR 1 HR	N-ASD-A04	9.95	9.95	0
10 YR 1 HR	N-ASD-A05	10.3	10.3	0
10 YR 1 HR	N-ASD-A06	10.99	10.99	0
10 YR 1 HR	N-ASD-A07	11.55	11.55	0
10 YR 1 HR	N-ASD-A08	12.21	12.21	0
10 YR 1 HR	N-ASD-A09	13.04	13.04	0
10 YR 1 HR	N-ASD-A11	14.02	14.02	0
10 YR 1 HR	N-ASD-A12	14.91	14.91	0
10 YR 1 HR	N-ASD-A13	15.49	15.49	0
10 YR 1 HR	N-ASD-A14	15.82	15.82	0
10 YR 1 HR	N-ASD-A15	16.4	16.4	0
10 YR 1 HR	N-ASD-A16	14.3	14.3	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASD-A17	16.61	16.61	0
10 YR 1 HR	N-ASD-A18	15.58	15.58	0
10 YR 1 HR	N-ASD-A19	14.92	14.92	0
10 YR 1 HR	N-ASD-B02	5.9	6.07	0.17
10 YR 1 HR	N-ASD-B03	7.08	7.02	-0.06
10 YR 1 HR	N-ASD-B04	7.52	7.96	0.44
10 YR 1 HR	N-ASD-B05	8.63	8.67	0.04
10 YR 1 HR	N-ASD-C03	6.06	6.14	0.08
10 YR 1 HR	N-ASD-C04	6.08	6.11	0.03
10 YR 1 HR	N-ASD-D04	7.85	7.79	-0.06
10 YR 1 HR	N-ASD-D05	8.43	8.42	-0.01
10 YR 1 HR	N-ASD-D06	8.14	8.14	0
10 YR 1 HR	N-ASD-D07	8.49	8.48	-0.01
10 YR 1 HR	N-ASD-E04	9.39	9.39	0
10 YR 1 HR	N-ASD-E05	10.23	10.23	0
10 YR 1 HR	N-ASD-E06	10.4	10.39	-0.01
10 YR 1 HR	N-ASD-E09	14.14	14.13	-0.01
10 YR 1 HR	N-ASD-E10	13.84	13.84	0
10 YR 1 HR	N-ASD-F03	8.62	8.17	-0.45
10 YR 1 HR	N-ASD-F04	9.24	9.18	-0.06
10 YR 1 HR	N-ASD-F05	9.67	9.57	-0.1
10 YR 1 HR	N-ASD-G04	8.9	8.91	0.01
10 YR 1 HR	N-ASD-H07	9.29	9.29	0
10 YR 1 HR	N-ASD-H08	9.42	9.42	0
10 YR 1 HR	N-ASD-I09	10.85	10.85	0
10 YR 1 HR	N-ASD-J10	12.51	12.51	0
10 YR 1 HR	N-ASD-K10	13.86	13.86	0
10 YR 1 HR	N-ASD-L07	10.46	10.46	0
10 YR 1 HR	N-ASD-Q06	10.32	10.32	0
10 YR 1 HR	N-ASD-Q08	11.23	11.23	0
10 YR 1 HR	N-ASD-Q09	12.64	12.64	0
10 YR 1 HR	N-ASD-R13	14.22	14.22	0
10 YR 1 HR	N-ASD-S13	14.84	14.84	0
10 YR 1 HR	N-ASD-T15	16.56	16.56	0
10 YR 1 HR	N-ASD-U06	10.26	10.26	0
10 YR 1 HR	N-ASE-A01	5.62	5.8	0.18
10 YR 1 HR	N-ASE-A02	5.82	6	0.18
10 YR 1 HR	N-ASE-A03	7.99	6.26	-1.73
10 YR 1 HR	N-ASE-A04	7.99	6.31	-1.68
10 YR 1 HR	N-ASE-A05	11.37	11.37	0
10 YR 1 HR	N-ASE-B02	5.67	5.8	0.13
10 YR 1 HR	N-ASE-C03	6.14	6.78	0.64
10 YR 1 HR	N-ASE-D03	6.79	7.93	1.14
10 YR 1 HR	N-ASF-A01	6.28	5.45	-0.83

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Area A Long Range Alternatives Selected
Alternative (1A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASF-A02	6.28	5.46	-0.82
10 YR 1 HR	N-ASG-A01	5.69	5.5	-0.19
10 YR 1 HR	N-ASG-A02	6.03	5.53	-0.5
10 YR 1 HR	N-ASG-A03	6.51	5.55	-0.96
10 YR 1 HR	N-ASG-A04	7.03	5.57	-1.46
10 YR 1 HR	N-ASG-A05	7.03	5.58	-1.45
10 YR 1 HR	N-ASG-A06	7.11	7.11	0
10 YR 1 HR	N-ASG-B02	5.72	5.5	-0.22
10 YR 1 HR	N-ASG-B03x	5.72	5.5	-0.22
10 YR 1 HR	N-ASG-C04	6.42	5.56	-0.86
10 YR 1 HR	N-ASG-C05	6.4	5.56	-0.84
10 YR 1 HR	N-ASH-A01	5.56	5.47	-0.09
10 YR 1 HR	N-ASH-A02	5.65	5.65	0
10 YR 1 HR	N-ASI-A01	5.43	5.44	0.01
10 YR 1 HR	N-ASJ	1.59	4.4	2.81
10 YR 1 HR	N-ASJ-A01	5.69	5.69	0
10 YR 1 HR	N-ASK-A01	5.42	5.47	0.05
10 YR 1 HR	P-ABB-A01-DSJ	#N/A	-1.98	#N/A
10 YR 1 HR	P-ABD-A01-DSJ	#N/A	-0.8	#N/A
10 YR 1 HR	P-ABK-A01-DSJ	#N/A	3.95	#N/A
10 YR 1 HR	P-ABO-A01-DSJ	#N/A	3.5	#N/A

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Area A Long Range Alternatives Selected Alternative (1A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 Hr FC	Added-8-DSJ	#N/A	-0.99	#N/A
25 YR 72 Hr FC	Added-Junction-1	#N/A	6.76	#N/A
25 YR 72 Hr FC	N-ABA	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABA-A01	4.85	1.86	-2.99
25 YR 72 Hr FC	N-ABA-A02	4.85	1.85	-3
25 YR 72 Hr FC	N-ABB	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABB-A01	4.04	0.37	-3.67
25 YR 72 Hr FC	N-ABB-A02	4.87	0.83	-4.04
25 YR 72 Hr FC	N-ABB-A03	4.88	1.07	-3.81
25 YR 72 Hr FC	N-ABB-A04	4.88	1.15	-3.73
25 YR 72 Hr FC	N-ABB-B02	4.87	1.8	-3.07
25 YR 72 Hr FC	N-ABB-B03	4.87	3.98	-0.89
25 YR 72 Hr FC	N-ABB-B03x	4.87	1.81	-3.06
25 YR 72 Hr FC	N-ABB-B04	4.87	3.98	-0.89
25 YR 72 Hr FC	N-ABC	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABC-A01	4.89	4.12	-0.77
25 YR 72 Hr FC	N-ABC-A02	4.89	4.13	-0.76
25 YR 72 Hr FC	N-ABC-B02	4.89	4.13	-0.76
25 YR 72 Hr FC	N-ABD	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABD-A01	4.91	3.98	-0.93
25 YR 72 Hr FC	N-ABD-A02	4.92	4.17	-0.75
25 YR 72 Hr FC	N-ABD-A02x	4.92	4	-0.92
25 YR 72 Hr FC	N-ABD-A03	5.22	4.69	-0.53
25 YR 72 Hr FC	N-ABD-A03x	4.93	4.18	-0.75
25 YR 72 Hr FC	N-ABD-A04	5.6	4.71	-0.89
25 YR 72 Hr FC	N-ABD-A05	5.66	4.77	-0.89
25 YR 72 Hr FC	N-ABD-A06	5.28	4.2	-1.08
25 YR 72 Hr FC	N-ABD-A07	5.28	4.22	-1.06
25 YR 72 Hr FC	N-ABD-B04	5.73	5.12	-0.61
25 YR 72 Hr FC	N-ABD-B05	5.74	5.3	-0.44
25 YR 72 Hr FC	N-ABD-B05x	5.72	5.13	-0.59
25 YR 72 Hr FC	N-ABD-B06	5.74	5.32	-0.42
25 YR 72 Hr FC	N-ABD-B07	6.82	6.47	-0.35
25 YR 72 Hr FC	N-ABD-B08	7.49	7.49	0
25 YR 72 Hr FC	N-ABE	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABE-A01	4.89	4.12	-0.77
25 YR 72 Hr FC	N-ABE-A02	4.89	4.13	-0.76
25 YR 72 Hr FC	N-ABF	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABF-A01	4.88	4.26	-0.62
25 YR 72 Hr FC	N-ABF-A02	4.89	4.26	-0.63
25 YR 72 Hr FC	N-ABG	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABG-A01	5.04	4.07	-0.97
25 YR 72 Hr FC	N-ABG-A02	5.04	4.06	-0.98
25 YR 72 Hr FC	N-ABG-A03	5.05	3.97	-1.08

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Area A Long Range Alternatives Selected Alternative (1A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 Hr FC	N-ABH	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABH-A01	4.6	2.91	-1.69
25 YR 72 Hr FC	N-ABH-A02	5.53	2.32	-3.21
25 YR 72 Hr FC	N-ABH-A03	5.53	3.44	-2.09
25 YR 72 Hr FC	N-ABH-A03x	5.53	3.33	-2.2
25 YR 72 Hr FC	N-ABH-B02	5.57	3.45	-2.12
25 YR 72 Hr FC	N-ABH-B03	5.58	3.72	-1.86
25 YR 72 Hr FC	N-ABH-B03x	5.59	4.65	-0.94
25 YR 72 Hr FC	N-ABH-B04	5.59	3.74	-1.85
25 YR 72 Hr FC	N-ABI	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABI-A01	5.52	3.84	-1.68
25 YR 72 Hr FC	N-ABI-A02	5.52	2.63	-2.89
25 YR 72 Hr FC	N-ABJ	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABJ-A01	5.52	3.5	-2.02
25 YR 72 Hr FC	N-ABJ-A02	5.52	2.57	-2.95
25 YR 72 Hr FC	N-ABK	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABK-A01	4.39	3.93	-0.46
25 YR 72 Hr FC	N-ABK-A02x1	6.85	6.57	-0.28
25 YR 72 Hr FC	N-ABK-A02x2	6.86	6.6	-0.26
25 YR 72 Hr FC	N-ABK-B02	5.47	3.94	-1.53
25 YR 72 Hr FC	N-ABK-B03	5.47	3.96	-1.51
25 YR 72 Hr FC	N-ABK-B04	7.51	6.54	-0.97
25 YR 72 Hr FC	N-ABL	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABL-A01	5.23	4.26	-0.97
25 YR 72 Hr FC	N-ABL-A02	5.22	4.41	-0.81
25 YR 72 Hr FC	N-ABM	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABM-A01	5.22	4.4	-0.82
25 YR 72 Hr FC	N-ABM-A02	5.22	4.44	-0.78
25 YR 72 Hr FC	N-ABN	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABN-A01	9.84	9.67	-0.17
25 YR 72 Hr FC	N-ABO	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABO-A01	4.42	3.5	-0.92
25 YR 72 Hr FC	N-ABO-A02	5.48	6.12	0.64
25 YR 72 Hr FC	N-ABP	1.59	4.4	2.81
25 YR 72 Hr FC	N-ABQ	1.59	4.4	2.81
25 YR 72 Hr FC	N-ADA-A01	6.84	6.58	-0.26
25 YR 72 Hr FC	N-ADA-A02	7.42	6.68	-0.74
25 YR 72 Hr FC	N-ADA-A03	7.42	6.69	-0.73
25 YR 72 Hr FC	N-ADA-A03x	7.41	6.69	-0.72
25 YR 72 Hr FC	N-ADA-A04	7.44	6.71	-0.73
25 YR 72 Hr FC	N-ADA-A05	7.44	6.71	-0.73
25 YR 72 Hr FC	N-ADA-B02	7.08	6.52	-0.56
25 YR 72 Hr FC	N-ADA-B03	7.07	6.51	-0.56
25 YR 72 Hr FC	N-ADA-B03x	7.07	6.51	-0.56

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Area A Long Range Alternatives Selected Alternative (1A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 Hr FC	N-ADA-B04	7.24	6.54	-0.7
25 YR 72 Hr FC	N-ADB-08	7.46	7.12	-0.34
25 YR 72 Hr FC	N-ADB-A01	7.6	6.87	-0.73
25 YR 72 Hr FC	N-ADB-A02	7.61	6.97	-0.64
25 YR 72 Hr FC	N-ADB-A03	8.59	7.04	-1.55
25 YR 72 Hr FC	N-ADB-A04	8.88	7.05	-1.83
25 YR 72 Hr FC	N-ADB-A04x	8.83	7.04	-1.79
25 YR 72 Hr FC	N-ADB-B03	7.62	7.33	-0.29
25 YR 72 Hr FC	N-ADB-B04	8.94	8.65	-0.29
25 YR 72 Hr FC	N-ADB-B05	8.97	8.75	-0.22
25 YR 72 Hr FC	N-ADB-B06	9.25	9.21	-0.04
25 YR 72 Hr FC	N-ADB-B07	9.87	9.71	-0.16
25 YR 72 Hr FC	N-ADB-B07x	9.8	9.65	-0.15
25 YR 72 Hr FC	N-ADC-A01	8.23	6.6	-1.63
25 YR 72 Hr FC	N-ADC-A02	8.23	6.61	-1.62
25 YR 72 Hr FC	N-ADD-A01	8.55	7.3	-1.25
25 YR 72 Hr FC	N-ADD-A02	8.75	7.63	-1.12
25 YR 72 Hr FC	N-ADD-A03	10.99	9.4	-1.59
25 YR 72 Hr FC	N-ADD-A04	10.99	9.84	-1.15
25 YR 72 Hr FC	N-ADD-A04x	10.99	9.4	-1.59
25 YR 72 Hr FC	N-ADD-A05	11.03	10.49	-0.54
25 YR 72 Hr FC	N-ADD-A06	11.04	10.74	-0.3
25 YR 72 Hr FC	N-ADD-A07	12.55	11.54	-1.01
25 YR 72 Hr FC	N-ADD-A08	12.57	11.87	-0.7
25 YR 72 Hr FC	N-ADD-A09	12.63	12.08	-0.55
25 YR 72 Hr FC	N-ADD-A10	12.63	12.25	-0.38
25 YR 72 Hr FC	N-ADD-A11	12.67	12.49	-0.18
25 YR 72 Hr FC	N-ADD-A12	13.12	12.74	-0.38
25 YR 72 Hr FC	N-ADD-A13	13.39	13.17	-0.22
25 YR 72 Hr FC	N-ADD-A14	13.38	13.18	-0.2
25 YR 72 Hr FC	N-ADD-A15	13.36	13.16	-0.2
25 YR 72 Hr FC	N-ADD-A16	13.26	13.14	-0.12
25 YR 72 Hr FC	N-ADD-B03	8.8	7.7	-1.1
25 YR 72 Hr FC	N-ADD-B05	11.74	11.74	0
25 YR 72 Hr FC	N-ADD-C04	11	10.69	-0.31
25 YR 72 Hr FC	N-ADD-C05	11.27	11.27	0
25 YR 72 Hr FC	N-ADD-D08	12.02	11.72	-0.3
25 YR 72 Hr FC	N-ADD-D09	11.9	11.79	-0.11
25 YR 72 Hr FC	N-ADD-H04	10.99	10.68	-0.31
25 YR 72 Hr FC	N-ADD-N13	12.9	12.74	-0.16
25 YR 72 Hr FC	N-ADD-N14	13.17	12.82	-0.35
25 YR 72 Hr FC	N-ADD-N15	12.56	12.74	0.18
25 YR 72 Hr FC	N-ADE-A01	7.76	6.86	-0.9
25 YR 72 Hr FC	N-ADE-A02	8.62	7.18	-1.44

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Area A Long Range Alternatives Selected Alternative (1A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 Hr FC	N-ADE-A03	8.76	7.49	-1.27
25 YR 72 Hr FC	N-ADE-A04	9.15	8.68	-0.47
25 YR 72 Hr FC	N-ADE-A04x	8.78	7.5	-1.28
25 YR 72 Hr FC	N-ADE-A05	10.89	10.89	0
25 YR 72 Hr FC	N-ADE-A05x	9.15	8.68	-0.47
25 YR 72 Hr FC	N-ADE-A06	11.25	11.25	0
25 YR 72 Hr FC	N-ADE-B02	7.3	6.87	-0.43
25 YR 72 Hr FC	N-ADE-B03	7.3	6.87	-0.43
25 YR 72 Hr FC	N-ADE-C02	7.77	6.89	-0.88
25 YR 72 Hr FC	N-ADE-C03	7.78	6.95	-0.83
25 YR 72 Hr FC	N-ADE-D03	7.28	6.87	-0.41
25 YR 72 Hr FC	N-ADS-A01	6.41	6.41	0
25 YR 72 Hr FC	N-ADS-A02	6.41	6.41	0
25 YR 72 Hr FC	N-ASA-A01	5.51	5.98	0.47
25 YR 72 Hr FC	N-ASA-A02	5.51	5.99	0.48
25 YR 72 Hr FC	N-ASA-A03	5.78	5.99	0.21
25 YR 72 Hr FC	N-ASA-A04	5.92	6	0.08
25 YR 72 Hr FC	N-ASA-A05	6.09	6.01	-0.08
25 YR 72 Hr FC	N-ASA-A06	6.17	6.02	-0.15
25 YR 72 Hr FC	N-ASA-A07	6.19	6.02	-0.17
25 YR 72 Hr FC	N-ASB-A01	5.59	6.01	0.42
25 YR 72 Hr FC	N-ASB-A02	5.59	6.01	0.42
25 YR 72 Hr FC	N-ASB-B02	5.83	6.01	0.18
25 YR 72 Hr FC	N-ASC-A01	5.68	6.43	0.75
25 YR 72 Hr FC	N-ASC-A02	6.83	6.97	0.14
25 YR 72 Hr FC	N-ASC-A03	7.11	7.02	-0.09
25 YR 72 Hr FC	N-ASC-A04	7.12	7.03	-0.09
25 YR 72 Hr FC	N-ASC-B02	6.17	6.43	0.26
25 YR 72 Hr FC	N-ASC-B03	6.26	6.44	0.18
25 YR 72 Hr FC	N-ASD-A01a	6.3	7.04	0.74
25 YR 72 Hr FC	N-ASD-A02	8.51	9.01	0.5
25 YR 72 Hr FC	N-ASD-A03	9.34	9.7	0.36
25 YR 72 Hr FC	N-ASD-A04	10.42	10.58	0.16
25 YR 72 Hr FC	N-ASD-A05	10.77	10.91	0.14
25 YR 72 Hr FC	N-ASD-A06	11.44	11.54	0.1
25 YR 72 Hr FC	N-ASD-A07	11.89	11.97	0.08
25 YR 72 Hr FC	N-ASD-A08	12.44	12.49	0.05
25 YR 72 Hr FC	N-ASD-A09	13.17	13.19	0.02
25 YR 72 Hr FC	N-ASD-A11	14.09	14.1	0.01
25 YR 72 Hr FC	N-ASD-A12	15.03	15.03	0
25 YR 72 Hr FC	N-ASD-A13	15.62	15.62	0
25 YR 72 Hr FC	N-ASD-A14	15.92	15.92	0
25 YR 72 Hr FC	N-ASD-A15	16.41	16.41	0
25 YR 72 Hr FC	N-ASD-A16	14.31	14.31	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 Hr FC	N-ASD-A17	16.62	16.62	0
25 YR 72 Hr FC	N-ASD-A18	15.58	15.58	0
25 YR 72 Hr FC	N-ASD-A19	14.93	14.93	0
25 YR 72 Hr FC	N-ASD-B02	6.43	7.18	0.75
25 YR 72 Hr FC	N-ASD-B03	7.84	8.29	0.45
25 YR 72 Hr FC	N-ASD-B04	8.09	8.6	0.51
25 YR 72 Hr FC	N-ASD-B05	8.8	8.91	0.11
25 YR 72 Hr FC	N-ASD-C03	8.95	9.04	0.09
25 YR 72 Hr FC	N-ASD-C04	7.11	7.32	0.21
25 YR 72 Hr FC	N-ASD-D04	8.96	9.04	0.08
25 YR 72 Hr FC	N-ASD-D05	9	9.06	0.06
25 YR 72 Hr FC	N-ASD-D06	8.77	8.8	0.03
25 YR 72 Hr FC	N-ASD-D07	9.07	9.11	0.04
25 YR 72 Hr FC	N-ASD-E04	9.84	10.14	0.3
25 YR 72 Hr FC	N-ASD-E05	10.78	10.92	0.14
25 YR 72 Hr FC	N-ASD-E06	10.98	11.11	0.13
25 YR 72 Hr FC	N-ASD-E09	14.21	14.22	0.01
25 YR 72 Hr FC	N-ASD-E10	13.9	13.91	0.01
25 YR 72 Hr FC	N-ASD-F03	9	9.09	0.09
25 YR 72 Hr FC	N-ASD-F04	9.28	9.29	0.01
25 YR 72 Hr FC	N-ASD-F05	9.69	9.69	0
25 YR 72 Hr FC	N-ASD-G04	9.35	9.71	0.36
25 YR 72 Hr FC	N-ASD-H07	9.55	9.55	0
25 YR 72 Hr FC	N-ASD-H08	9.55	9.55	0
25 YR 72 Hr FC	N-ASD-I09	10.9	10.9	0
25 YR 72 Hr FC	N-ASD-J10	12.54	12.54	0
25 YR 72 Hr FC	N-ASD-K10	13.9	13.9	0
25 YR 72 Hr FC	N-ASD-L07	11.3	11.31	0.01
25 YR 72 Hr FC	N-ASD-Q06	10.93	11.06	0.13
25 YR 72 Hr FC	N-ASD-Q08	11.7	11.77	0.07
25 YR 72 Hr FC	N-ASD-Q09	12.78	12.8	0.02
25 YR 72 Hr FC	N-ASD-R13	14.25	14.25	0
25 YR 72 Hr FC	N-ASD-S13	14.85	14.85	0
25 YR 72 Hr FC	N-ASD-T15	16.56	16.56	0
25 YR 72 Hr FC	N-ASD-U06	10.79	10.93	0.14
25 YR 72 Hr FC	N-ASE-A01	6.11	6.78	0.67
25 YR 72 Hr FC	N-ASE-A02	6.38	7.31	0.93
25 YR 72 Hr FC	N-ASE-A03	9.1	7.99	-1.11
25 YR 72 Hr FC	N-ASE-A04	9.11	7.99	-1.12
25 YR 72 Hr FC	N-ASE-A05	11.45	11.45	0
25 YR 72 Hr FC	N-ASE-B02	6.14	6.77	0.63
25 YR 72 Hr FC	N-ASE-C03	7.04	8.14	1.1
25 YR 72 Hr FC	N-ASE-D03	7.87	8.15	0.28
25 YR 72 Hr FC	N-ASF-A01	6.47	6.23	-0.24

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Area A Long Range Alternatives Selected Alternative (1A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 Hr FC	N-ASF-A02	6.47	6.24	-0.23
25 YR 72 Hr FC	N-ASG-A01	5.93	6.16	0.23
25 YR 72 Hr FC	N-ASG-A02	6.27	6.26	-0.01
25 YR 72 Hr FC	N-ASG-A03	6.8	6.3	-0.5
25 YR 72 Hr FC	N-ASG-A04	7.46	6.39	-1.07
25 YR 72 Hr FC	N-ASG-A05	7.46	6.42	-1.04
25 YR 72 Hr FC	N-ASG-A06	7.13	7.13	0
25 YR 72 Hr FC	N-ASG-B02	5.94	6.14	0.2
25 YR 72 Hr FC	N-ASG-B03x	5.94	6.14	0.2
25 YR 72 Hr FC	N-ASG-C04	6.54	6.31	-0.23
25 YR 72 Hr FC	N-ASG-C05	6.45	6.32	-0.13
25 YR 72 Hr FC	N-ASH-A01	5.94	6.15	0.21
25 YR 72 Hr FC	N-ASH-A02	5.94	6.15	0.21
25 YR 72 Hr FC	N-ASI-A01	5.47	5.61	0.14
25 YR 72 Hr FC	N-ASJ	1.59	4.4	2.81
25 YR 72 Hr FC	N-ASJ-A01	5.71	6.12	0.41
25 YR 72 Hr FC	N-ASK-A01	5.55	6.14	0.59
25 YR 72 Hr FC	P-ABB-A01-DSJ	#N/A	-1.97	#N/A
25 YR 72 Hr FC	P-ABD-A01-DSJ	#N/A	-0.8	#N/A
25 YR 72 Hr FC	P-ABK-A01-DSJ	#N/A	3.9	#N/A
25 YR 72 Hr FC	P-ABO-A01-DSJ	#N/A	3.5	#N/A

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Area A Long Range Alternatives Unselected
Alternative (2A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	J-ABK-A02	#N/A	-1.02	#N/A
10 YR 1 HR	Junction-1	#N/A	4.4	#N/A
10 YR 1 HR	Junction-2	#N/A	4.4	#N/A
10 YR 1 HR	Junction-3	#N/A	4.4	#N/A
10 YR 1 HR	Junction-4	#N/A	4.4	#N/A
10 YR 1 HR	Junction-5	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-01	#N/A	-1.69	#N/A
10 YR 1 HR	Junction-Add-02	#N/A	-2.54	#N/A
10 YR 1 HR	Junction-Add-03	#N/A	-1.02	#N/A
10 YR 1 HR	Junction-Add-04	#N/A	-2.14	#N/A
10 YR 1 HR	Junction-Add-05	#N/A	-1.81	#N/A
10 YR 1 HR	Junction-Add-06	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-07	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-08	#N/A	-1.5	#N/A
10 YR 1 HR	Junction-Add-09	#N/A	-0.49	#N/A
10 YR 1 HR	Junction-Add-10	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-11	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-12	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-13	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-14	#N/A	-4.94	#N/A
10 YR 1 HR	N-ABA	1.59	4.4	2.81
10 YR 1 HR	N-ABA-A01	3.66	-5	-8.66
10 YR 1 HR	N-ABA-A02	3.83	-5	-8.83
10 YR 1 HR	N-ABB	1.59	4.4	2.81
10 YR 1 HR	N-ABB-A01	3.57	-5	-8.57
10 YR 1 HR	N-ABB-A02	4.23	-5	-9.23
10 YR 1 HR	N-ABB-A03	4.23	-5	-9.23
10 YR 1 HR	N-ABB-A04	4.23	-5	-9.23
10 YR 1 HR	N-ABB-B02	4.25	-5	-9.25
10 YR 1 HR	N-ABB-B03	4.27	-5	-9.27
10 YR 1 HR	N-ABB-B03x	4.28	-5	-9.28
10 YR 1 HR	N-ABB-B04	4.28	-5	-9.28
10 YR 1 HR	N-ABC	1.59	4.4	2.81
10 YR 1 HR	N-ABC-A01	4.21	-5	-9.21
10 YR 1 HR	N-ABC-A02	4.22	-5	-9.22
10 YR 1 HR	N-ABC-B02	4.21	-5	-9.21
10 YR 1 HR	N-ABD	1.59	4.4	2.81
10 YR 1 HR	N-ABD-A01	3.33	-5	-8.33
10 YR 1 HR	N-ABD-A02	4.06	-5	-9.06
10 YR 1 HR	N-ABD-A02x	3.76	-5	-8.76
10 YR 1 HR	N-ABD-A03	4.64	-5	-9.64
10 YR 1 HR	N-ABD-A03x	4.11	-5	-9.11
10 YR 1 HR	N-ABD-A04	4.95	-5	-9.95
10 YR 1 HR	N-ABD-A05	5.18	-5	-10.18

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ABD-A06	5.19	-5	-10.19
10 YR 1 HR	N-ABD-A07	5.19	-5	-10.19
10 YR 1 HR	N-ABD-B04	5.43	-5	-10.43
10 YR 1 HR	N-ABD-B05	5.52	-5	-10.52
10 YR 1 HR	N-ABD-B05x	5.43	-5	-10.43
10 YR 1 HR	N-ABD-B06	5.53	-5	-10.53
10 YR 1 HR	N-ABD-B07	6.17	-5	-11.17
10 YR 1 HR	N-ABD-B08	7.41	-5	-12.41
10 YR 1 HR	N-ABE	1.59	4.4	2.81
10 YR 1 HR	N-ABE-A01	2.05	-0.49	-2.54
10 YR 1 HR	N-ABE-A02	2.68	-0.49	-3.17
10 YR 1 HR	N-ABF	1.59	4.4	2.81
10 YR 1 HR	N-ABF-A01	4.11	-1.5	-5.61
10 YR 1 HR	N-ABF-A02	4.11	-1.5	-5.61
10 YR 1 HR	N-ABG	1.59	4.4	2.81
10 YR 1 HR	N-ABG-A01	4.53	-5	-9.53
10 YR 1 HR	N-ABG-A02	4.76	-5	-9.76
10 YR 1 HR	N-ABG-A03	4.79	-5	-9.79
10 YR 1 HR	N-ABH	1.59	4.4	2.81
10 YR 1 HR	N-ABH-A01	4.07	-5	-9.07
10 YR 1 HR	N-ABH-A02	4.98	-5	-9.98
10 YR 1 HR	N-ABH-A03	4.98	-5	-9.98
10 YR 1 HR	N-ABH-A03x	4.98	-5	-9.98
10 YR 1 HR	N-ABH-B02	5.02	-5	-10.02
10 YR 1 HR	N-ABH-B03	5.03	-5	-10.03
10 YR 1 HR	N-ABH-B03x	5.03	-5	-10.03
10 YR 1 HR	N-ABH-B04	5.04	-5	-10.04
10 YR 1 HR	N-ABI	1.59	4.4	2.81
10 YR 1 HR	N-ABI-A01	4.93	-1.81	-6.74
10 YR 1 HR	N-ABI-A02	4.93	-1.81	-6.74
10 YR 1 HR	N-ABJ	1.59	4.4	2.81
10 YR 1 HR	N-ABJ-A01	4.95	-2.14	-7.09
10 YR 1 HR	N-ABJ-A02	4.95	-2.14	-7.09
10 YR 1 HR	N-ABK	1.59	4.4	2.81
10 YR 1 HR	N-ABK-A01	3.71	-1.02	-4.73
10 YR 1 HR	N-ABK-A02x1	5.66	-1.02	-6.68
10 YR 1 HR	N-ABK-A02x2	5.67	4.35	-1.32
10 YR 1 HR	N-ABK-B02	4.99	-1.02	-6.01
10 YR 1 HR	N-ABK-B03	4.99	-1.02	-6.01
10 YR 1 HR	N-ABK-B04	7.48	-1.02	-8.5
10 YR 1 HR	N-ABL	1.59	4.4	2.81
10 YR 1 HR	N-ABL-A01	3.41	-2.54	-5.95
10 YR 1 HR	N-ABL-A02	4.33	-2.54	-6.87
10 YR 1 HR	N-ABM	1.59	4.4	2.81

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ABM-A01	4.74	-1.69	-6.43
10 YR 1 HR	N-ABM-A02	4.74	-1.69	-6.43
10 YR 1 HR	N-ABN	1.59	4.4	2.81
10 YR 1 HR	N-ABN-A01	9.68	-5	-14.68
10 YR 1 HR	N-ABO	1.59	4.4	2.81
10 YR 1 HR	N-ABO-A01	3.81	-4.94	-8.75
10 YR 1 HR	N-ABO-A02	5.2	4.4	-0.8
10 YR 1 HR	N-ABP	1.59	4.4	2.81
10 YR 1 HR	N-ABQ	1.59	4.4	2.81
10 YR 1 HR	N-ADA-A01	6.1	-1.02	-7.12
10 YR 1 HR	N-ADA-A02	6.92	-1.02	-7.94
10 YR 1 HR	N-ADA-A03	6.93	-1.02	-7.95
10 YR 1 HR	N-ADA-A03x	6.92	-1.02	-7.94
10 YR 1 HR	N-ADA-A04	6.94	-1.02	-7.96
10 YR 1 HR	N-ADA-A05	6.94	-1.02	-7.96
10 YR 1 HR	N-ADA-B02	6.57	-1.02	-7.59
10 YR 1 HR	N-ADA-B03	6.57	-1.02	-7.59
10 YR 1 HR	N-ADA-B03x	6.57	-1.02	-7.59
10 YR 1 HR	N-ADA-B04	7.22	-1.02	-8.24
10 YR 1 HR	N-ADB-08	7.07	4.7	-2.37
10 YR 1 HR	N-ADB-A01	7.3	-1.02	-8.32
10 YR 1 HR	N-ADB-A02	7.48	-1.02	-8.5
10 YR 1 HR	N-ADB-A03	8.47	-1.02	-9.49
10 YR 1 HR	N-ADB-A04	8.84	-1.02	-9.86
10 YR 1 HR	N-ADB-A04x	8.76	-1.02	-9.78
10 YR 1 HR	N-ADB-B03	7.49	-1.02	-8.51
10 YR 1 HR	N-ADB-B04	8.83	-1.02	-9.85
10 YR 1 HR	N-ADB-B05	8.86	-1.02	-9.88
10 YR 1 HR	N-ADB-B06	9.16	-5	-14.16
10 YR 1 HR	N-ADB-B07	9.7	-5	-14.7
10 YR 1 HR	N-ADB-B07x	9.66	-5	-14.66
10 YR 1 HR	N-ADC-A01	7.96	-1.02	-8.98
10 YR 1 HR	N-ADC-A02	7.97	-1.02	-8.99
10 YR 1 HR	N-ADD-A01	7.8	4.35	-3.45
10 YR 1 HR	N-ADD-A02	7.93	4.35	-3.58
10 YR 1 HR	N-ADD-A03	10.93	4.35	-6.58
10 YR 1 HR	N-ADD-A04	10.93	4.35	-6.58
10 YR 1 HR	N-ADD-A04x	10.93	4.35	-6.58
10 YR 1 HR	N-ADD-A05	10.98	4.35	-6.63
10 YR 1 HR	N-ADD-A06	10.99	4.35	-6.64
10 YR 1 HR	N-ADD-A07	12.51	4.69	-7.82
10 YR 1 HR	N-ADD-A08	12.53	5.18	-7.35
10 YR 1 HR	N-ADD-A09	12.59	6.64	-5.95
10 YR 1 HR	N-ADD-A10	12.59	6.68	-5.91

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Area A Long Range Alternatives Unselected Alternative (2A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADD-A11	12.64	6.87	-5.77
10 YR 1 HR	N-ADD-A12	13.08	7.76	-5.32
10 YR 1 HR	N-ADD-A13	13.36	7.74	-5.62
10 YR 1 HR	N-ADD-A14	13.37	7.73	-5.64
10 YR 1 HR	N-ADD-A15	13.35	8.16	-5.19
10 YR 1 HR	N-ADD-A16	13.25	7.86	-5.39
10 YR 1 HR	N-ADD-B03	7.95	4.35	-3.6
10 YR 1 HR	N-ADD-B05	11.67	10.6	-1.07
10 YR 1 HR	N-ADD-C04	10.94	4.4	-6.54
10 YR 1 HR	N-ADD-C05	11.24	10.2	-1.04
10 YR 1 HR	N-ADD-D08	12.01	7.2	-4.81
10 YR 1 HR	N-ADD-D09	11.87	7.46	-4.41
10 YR 1 HR	N-ADD-H04	10.93	6.7	-4.23
10 YR 1 HR	N-ADD-N13	12.88	7.63	-5.25
10 YR 1 HR	N-ADD-N14	13.15	7.4	-5.75
10 YR 1 HR	N-ADD-N15	12.55	7.1	-5.45
10 YR 1 HR	N-ADE-A01	6.96	-5	-11.96
10 YR 1 HR	N-ADE-A02	8.4	-5	-13.4
10 YR 1 HR	N-ADE-A03	8.68	-5	-13.68
10 YR 1 HR	N-ADE-A04	9.1	-5	-14.1
10 YR 1 HR	N-ADE-A04x	8.7	-5	-13.7
10 YR 1 HR	N-ADE-A05	10.84	-5	-15.84
10 YR 1 HR	N-ADE-A05x	9.1	-5	-14.1
10 YR 1 HR	N-ADE-A06	11.2	10.6	-0.6
10 YR 1 HR	N-ADE-B02	7.01	-5	-12.01
10 YR 1 HR	N-ADE-B03	7.02	-5	-12.02
10 YR 1 HR	N-ADE-C02	7.52	-5	-12.52
10 YR 1 HR	N-ADE-C03	7.54	-5	-12.54
10 YR 1 HR	N-ADE-D03	7	-5	-12
10 YR 1 HR	N-ADS-A01	5.67	-1.02	-6.69
10 YR 1 HR	N-ADS-A02	5.99	-1.02	-7.01
10 YR 1 HR	N-ASA-A01	5.41	-5	-10.41
10 YR 1 HR	N-ASA-A02	5.41	-5	-10.41
10 YR 1 HR	N-ASA-A03	5.61	-5	-10.61
10 YR 1 HR	N-ASA-A04	5.72	-5	-10.72
10 YR 1 HR	N-ASA-A05	5.89	-5	-10.89
10 YR 1 HR	N-ASA-A06	6.09	-5	-11.09
10 YR 1 HR	N-ASA-A07	6.12	-5	-11.12
10 YR 1 HR	N-ASB-A01	5.55	-5	-10.55
10 YR 1 HR	N-ASB-A02	5.55	-5	-10.55
10 YR 1 HR	N-ASB-B02	5.8	-5	-10.8
10 YR 1 HR	N-ASC-A01	5.32	-5	-10.32
10 YR 1 HR	N-ASC-A02	5.99	-5	-10.99
10 YR 1 HR	N-ASC-A03	6.24	-5	-11.24

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASC-A04	6.5	-5	-11.5
10 YR 1 HR	N-ASC-B02	5.61	-5	-10.61
10 YR 1 HR	N-ASC-B03	5.65	-5	-10.65
10 YR 1 HR	N-ASD-A01a	5.82	4.4	-1.42
10 YR 1 HR	N-ASD-A02	8.07	4.4	-3.67
10 YR 1 HR	N-ASD-A03	8.89	4.4	-4.49
10 YR 1 HR	N-ASD-A04	9.95	4.4	-5.55
10 YR 1 HR	N-ASD-A05	10.3	5.3	-5
10 YR 1 HR	N-ASD-A06	10.99	7.2	-3.79
10 YR 1 HR	N-ASD-A07	11.55	7.8	-3.75
10 YR 1 HR	N-ASD-A08	12.21	9	-3.21
10 YR 1 HR	N-ASD-A09	13.04	10	-3.04
10 YR 1 HR	N-ASD-A11	14.02	10.6	-3.42
10 YR 1 HR	N-ASD-A12	14.91	12.4	-2.51
10 YR 1 HR	N-ASD-A13	15.49	12.7	-2.79
10 YR 1 HR	N-ASD-A14	15.82	13.6	-2.22
10 YR 1 HR	N-ASD-A15	16.4	14.4	-2
10 YR 1 HR	N-ASD-A16	14.3	12.2	-2.1
10 YR 1 HR	N-ASD-A17	16.61	15.2	-1.41
10 YR 1 HR	N-ASD-A18	15.58	14.6	-0.98
10 YR 1 HR	N-ASD-A19	14.92	13.8	-1.12
10 YR 1 HR	N-ASD-B02	5.9	4.4	-1.5
10 YR 1 HR	N-ASD-B03	7.08	4.4	-2.68
10 YR 1 HR	N-ASD-B04	7.52	4.4	-3.12
10 YR 1 HR	N-ASD-B05	8.63	4.4	-4.23
10 YR 1 HR	N-ASD-C03	6.06	4.4	-1.66
10 YR 1 HR	N-ASD-C04	6.08	4.4	-1.68
10 YR 1 HR	N-ASD-D04	7.85	4.4	-3.45
10 YR 1 HR	N-ASD-D05	8.43	6.7	-1.73
10 YR 1 HR	N-ASD-D06	8.14	3.72	-4.42
10 YR 1 HR	N-ASD-D07	8.49	5.36	-3.13
10 YR 1 HR	N-ASD-E04	9.39	5.4	-3.99
10 YR 1 HR	N-ASD-E05	10.23	5.9	-4.33
10 YR 1 HR	N-ASD-E06	10.4	6.1	-4.3
10 YR 1 HR	N-ASD-E09	14.14	9.8	-4.34
10 YR 1 HR	N-ASD-E10	13.84	10.6	-3.24
10 YR 1 HR	N-ASD-F03	8.62	4.4	-4.22
10 YR 1 HR	N-ASD-F04	9.24	4.4	-4.84
10 YR 1 HR	N-ASD-F05	9.67	-0.9	-10.57
10 YR 1 HR	N-ASD-G04	8.9	7.5	-1.4
10 YR 1 HR	N-ASD-H07	9.29	6.1	-3.19
10 YR 1 HR	N-ASD-H08	9.42	8.8	-0.62
10 YR 1 HR	N-ASD-I09	10.85	9.3	-1.55
10 YR 1 HR	N-ASD-J10	12.51	10	-2.51

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASD-K10	13.86	10.6	-3.26
10 YR 1 HR	N-ASD-L07	10.46	6.5	-3.96
10 YR 1 HR	N-ASD-Q06	10.32	6.5	-3.82
10 YR 1 HR	N-ASD-Q08	11.23	7.4	-3.83
10 YR 1 HR	N-ASD-Q09	12.64	7.4	-5.24
10 YR 1 HR	N-ASD-R13	14.22	10.6	-3.62
10 YR 1 HR	N-ASD-S13	14.84	12.8	-2.04
10 YR 1 HR	N-ASD-T15	16.56	13.6	-2.96
10 YR 1 HR	N-ASD-U06	10.26	7.2	-3.06
10 YR 1 HR	N-ASE-A01	5.62	4.4	-1.22
10 YR 1 HR	N-ASE-A02	5.82	4.4	-1.42
10 YR 1 HR	N-ASE-A03	7.99	4.4	-3.59
10 YR 1 HR	N-ASE-A04	7.99	4.4	-3.59
10 YR 1 HR	N-ASE-A05	11.37	10.3	-1.07
10 YR 1 HR	N-ASE-B02	5.67	4.4	-1.27
10 YR 1 HR	N-ASE-C03	6.14	4.4	-1.74
10 YR 1 HR	N-ASE-D03	6.79	4.4	-2.39
10 YR 1 HR	N-ASF-A01	6.28	4.4	-1.88
10 YR 1 HR	N-ASF-A02	6.28	4.4	-1.88
10 YR 1 HR	N-ASG-A01	5.69	4.4	-1.29
10 YR 1 HR	N-ASG-A02	6.03	4.4	-1.63
10 YR 1 HR	N-ASG-A03	6.51	4.4	-2.11
10 YR 1 HR	N-ASG-A04	7.03	4.4	-2.63
10 YR 1 HR	N-ASG-A05	7.03	4.4	-2.63
10 YR 1 HR	N-ASG-A06	7.11	6.5	-0.61
10 YR 1 HR	N-ASG-B02	5.72	4.4	-1.32
10 YR 1 HR	N-ASG-B03x	5.72	4.4	-1.32
10 YR 1 HR	N-ASG-C04	6.42	4.4	-2.02
10 YR 1 HR	N-ASG-C05	6.4	4.4	-2
10 YR 1 HR	N-ASH-A01	5.56	4.4	-1.16
10 YR 1 HR	N-ASH-A02	5.65	5.4	-0.25
10 YR 1 HR	N-ASI-A01	5.43	4.4	-1.03
10 YR 1 HR	N-ASJ	1.59	4.4	2.81
10 YR 1 HR	N-ASJ-A01	5.69	0	-5.69
10 YR 1 HR	N-ASK-A01	5.42	0	-5.42

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Area A Long Range Alternatives Unselected Alternative (2A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	J-ABK-A02	#N/A	6.17	#N/A
25 YR 72 HR	Junction-1	#N/A	6.41	#N/A
25 YR 72 HR	Junction-2	#N/A	6.61	#N/A
25 YR 72 HR	Junction-3	#N/A	6.43	#N/A
25 YR 72 HR	Junction-4	#N/A	6.64	#N/A
25 YR 72 HR	Junction-5	#N/A	4.26	#N/A
25 YR 72 HR	Junction-Add-01	#N/A	1.31	#N/A
25 YR 72 HR	Junction-Add-02	#N/A	0.46	#N/A
25 YR 72 HR	Junction-Add-03	#N/A	2.84	#N/A
25 YR 72 HR	Junction-Add-04	#N/A	0.86	#N/A
25 YR 72 HR	Junction-Add-05	#N/A	1.19	#N/A
25 YR 72 HR	Junction-Add-06	#N/A	-2	#N/A
25 YR 72 HR	Junction-Add-07	#N/A	-2	#N/A
25 YR 72 HR	Junction-Add-08	#N/A	1.5	#N/A
25 YR 72 HR	Junction-Add-09	#N/A	2.51	#N/A
25 YR 72 HR	Junction-Add-10	#N/A	1.19	#N/A
25 YR 72 HR	Junction-Add-11	#N/A	-1.98	#N/A
25 YR 72 HR	Junction-Add-12	#N/A	1.17	#N/A
25 YR 72 HR	Junction-Add-13	#N/A	-1.99	#N/A
25 YR 72 HR	Junction-Add-14	#N/A	-1.93	#N/A
25 YR 72 HR	N-ABA	1.59	4.4	2.81
25 YR 72 HR	N-ABA-A01	4.85	2.79	-2.06
25 YR 72 HR	N-ABA-A02	4.85	2.7	-2.15
25 YR 72 HR	N-ABB	1.59	4.4	2.81
25 YR 72 HR	N-ABB-A01	4.04	3.12	-0.92
25 YR 72 HR	N-ABB-A02	4.87	3.16	-1.71
25 YR 72 HR	N-ABB-A03	4.88	3.17	-1.71
25 YR 72 HR	N-ABB-A04	4.88	3.24	-1.64
25 YR 72 HR	N-ABB-B02	4.87	3.15	-1.72
25 YR 72 HR	N-ABB-B03	4.87	3.29	-1.58
25 YR 72 HR	N-ABB-B03x	4.87	3.03	-1.84
25 YR 72 HR	N-ABB-B04	4.87	3.17	-1.7
25 YR 72 HR	N-ABC	1.59	4.4	2.81
25 YR 72 HR	N-ABC-A01	4.89	3.19	-1.7
25 YR 72 HR	N-ABC-A02	4.89	3.4	-1.49
25 YR 72 HR	N-ABC-B02	4.89	3.25	-1.64
25 YR 72 HR	N-ABD	1.59	4.4	2.81
25 YR 72 HR	N-ABD-A01	4.91	3.28	-1.63
25 YR 72 HR	N-ABD-A02	4.92	3.46	-1.46
25 YR 72 HR	N-ABD-A02x	4.92	3.32	-1.6
25 YR 72 HR	N-ABD-A03	5.22	3.66	-1.56
25 YR 72 HR	N-ABD-A03x	4.93	3.75	-1.18
25 YR 72 HR	N-ABD-A04	5.6	3.69	-1.91
25 YR 72 HR	N-ABD-A05	5.66	3.81	-1.85

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ABD-A06	5.28	3.52	-1.76
25 YR 72 HR	N-ABD-A07	5.28	3.54	-1.74
25 YR 72 HR	N-ABD-B04	5.73	4.12	-1.61
25 YR 72 HR	N-ABD-B05	5.74	4.35	-1.39
25 YR 72 HR	N-ABD-B05x	5.72	4.14	-1.58
25 YR 72 HR	N-ABD-B06	5.74	4.41	-1.33
25 YR 72 HR	N-ABD-B07	6.82	5.47	-1.35
25 YR 72 HR	N-ABD-B08	7.49	7.49	0
25 YR 72 HR	N-ABE	1.59	4.4	2.81
25 YR 72 HR	N-ABE-A01	4.89	2.68	-2.21
25 YR 72 HR	N-ABE-A02	4.89	3.34	-1.55
25 YR 72 HR	N-ABF	1.59	4.4	2.81
25 YR 72 HR	N-ABF-A01	4.88	1.73	-3.15
25 YR 72 HR	N-ABF-A02	4.89	1.76	-3.13
25 YR 72 HR	N-ABG	1.59	4.4	2.81
25 YR 72 HR	N-ABG-A01	5.04	0.72	-4.32
25 YR 72 HR	N-ABG-A02	5.04	3.4	-1.64
25 YR 72 HR	N-ABG-A03	5.05	3.43	-1.62
25 YR 72 HR	N-ABH	1.59	4.4	2.81
25 YR 72 HR	N-ABH-A01	4.6	-1.63	-6.23
25 YR 72 HR	N-ABH-A02	5.53	4.13	-1.4
25 YR 72 HR	N-ABH-A03	5.53	4.17	-1.36
25 YR 72 HR	N-ABH-A03x	5.53	4.15	-1.38
25 YR 72 HR	N-ABH-B02	5.57	3.64	-1.93
25 YR 72 HR	N-ABH-B03	5.58	3.45	-2.13
25 YR 72 HR	N-ABH-B03x	5.59	4.66	-0.93
25 YR 72 HR	N-ABH-B04	5.59	3.46	-2.13
25 YR 72 HR	N-ABI	1.59	4.4	2.81
25 YR 72 HR	N-ABI-A01	5.52	1.4	-4.12
25 YR 72 HR	N-ABI-A02	5.52	3.68	-1.84
25 YR 72 HR	N-ABJ	1.59	4.4	2.81
25 YR 72 HR	N-ABJ-A01	5.52	1.35	-4.17
25 YR 72 HR	N-ABJ-A02	5.52	3.28	-2.24
25 YR 72 HR	N-ABK	1.59	4.4	2.81
25 YR 72 HR	N-ABK-A01	4.39	4.21	-0.18
25 YR 72 HR	N-ABK-A02x1	6.85	6.71	-0.14
25 YR 72 HR	N-ABK-A02x2	6.86	6.72	-0.14
25 YR 72 HR	N-ABK-B02	5.47	4.27	-1.2
25 YR 72 HR	N-ABK-B03	5.47	4.33	-1.14
25 YR 72 HR	N-ABK-B04	7.51	6.61	-0.9
25 YR 72 HR	N-ABL	1.59	4.4	2.81
25 YR 72 HR	N-ABL-A01	5.23	2	-3.23
25 YR 72 HR	N-ABL-A02	5.22	4.41	-0.81
25 YR 72 HR	N-ABM	1.59	4.4	2.81

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Area A Long Range Alternatives Unselected Alternative (2A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ABM-A01	5.22	2.07	-3.15
25 YR 72 HR	N-ABM-A02	5.22	4.08	-1.14
25 YR 72 HR	N-ABN	1.59	4.4	2.81
25 YR 72 HR	N-ABN-A01	9.84	9.67	-0.17
25 YR 72 HR	N-ABO	1.59	4.4	2.81
25 YR 72 HR	N-ABO-A01	4.42	1.52	-2.9
25 YR 72 HR	N-ABO-A02	5.48	5.86	0.38
25 YR 72 HR	N-ABP	1.59	4.4	2.81
25 YR 72 HR	N-ABQ	1.59	4.4	2.81
25 YR 72 HR	N-ADA-A01	6.84	6.67	-0.17
25 YR 72 HR	N-ADA-A02	7.42	6.83	-0.59
25 YR 72 HR	N-ADA-A03	7.42	6.83	-0.59
25 YR 72 HR	N-ADA-A03x	7.41	6.83	-0.58
25 YR 72 HR	N-ADA-A04	7.44	6.86	-0.58
25 YR 72 HR	N-ADA-A05	7.44	6.86	-0.58
25 YR 72 HR	N-ADA-B02	7.08	6.5	-0.58
25 YR 72 HR	N-ADA-B03	7.07	6.48	-0.59
25 YR 72 HR	N-ADA-B03x	7.07	6.49	-0.58
25 YR 72 HR	N-ADA-B04	7.24	6.57	-0.67
25 YR 72 HR	N-ADB-08	7.46	7.12	-0.34
25 YR 72 HR	N-ADB-A01	7.6	6.83	-0.77
25 YR 72 HR	N-ADB-A02	7.61	6.91	-0.7
25 YR 72 HR	N-ADB-A03	8.59	6.93	-1.66
25 YR 72 HR	N-ADB-A04	8.88	6.93	-1.95
25 YR 72 HR	N-ADB-A04x	8.83	6.93	-1.9
25 YR 72 HR	N-ADB-B03	7.62	7.25	-0.37
25 YR 72 HR	N-ADB-B04	8.94	8.33	-0.61
25 YR 72 HR	N-ADB-B05	8.97	8.64	-0.33
25 YR 72 HR	N-ADB-B06	9.25	9.21	-0.04
25 YR 72 HR	N-ADB-B07	9.87	9.7	-0.17
25 YR 72 HR	N-ADB-B07x	9.8	9.65	-0.15
25 YR 72 HR	N-ADC-A01	8.23	6.72	-1.51
25 YR 72 HR	N-ADC-A02	8.23	6.72	-1.51
25 YR 72 HR	N-ADD-A01	8.55	6.74	-1.81
25 YR 72 HR	N-ADD-A02	8.75	6.9	-1.85
25 YR 72 HR	N-ADD-A03	10.99	7.45	-3.54
25 YR 72 HR	N-ADD-A04	10.99	8.06	-2.93
25 YR 72 HR	N-ADD-A04x	10.99	7.46	-3.53
25 YR 72 HR	N-ADD-A05	11.03	9	-2.03
25 YR 72 HR	N-ADD-A06	11.04	9.35	-1.69
25 YR 72 HR	N-ADD-A07	12.55	10.69	-1.86
25 YR 72 HR	N-ADD-A08	12.57	11.2	-1.37
25 YR 72 HR	N-ADD-A09	12.63	11.58	-1.05
25 YR 72 HR	N-ADD-A10	12.63	11.98	-0.65

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ADD-A11	12.67	12.33	-0.34
25 YR 72 HR	N-ADD-A12	13.12	12.68	-0.44
25 YR 72 HR	N-ADD-A13	13.39	13.14	-0.25
25 YR 72 HR	N-ADD-A14	13.38	13.15	-0.23
25 YR 72 HR	N-ADD-A15	13.36	13.13	-0.23
25 YR 72 HR	N-ADD-A16	13.26	13.12	-0.14
25 YR 72 HR	N-ADD-B03	8.8	6.98	-1.82
25 YR 72 HR	N-ADD-B05	11.74	11.74	0
25 YR 72 HR	N-ADD-C04	11	10.69	-0.31
25 YR 72 HR	N-ADD-C05	11.27	11.27	0
25 YR 72 HR	N-ADD-D08	12.02	11.51	-0.51
25 YR 72 HR	N-ADD-D09	11.9	11.71	-0.19
25 YR 72 HR	N-ADD-H04	10.99	10.66	-0.33
25 YR 72 HR	N-ADD-N13	12.9	12.68	-0.22
25 YR 72 HR	N-ADD-N14	13.17	12.78	-0.39
25 YR 72 HR	N-ADD-N15	12.56	12.72	0.16
25 YR 72 HR	N-ADE-A01	7.76	6.09	-1.67
25 YR 72 HR	N-ADE-A02	8.62	7.08	-1.54
25 YR 72 HR	N-ADE-A03	8.76	7.57	-1.19
25 YR 72 HR	N-ADE-A04	9.15	8.86	-0.29
25 YR 72 HR	N-ADE-A04x	8.78	7.58	-1.2
25 YR 72 HR	N-ADE-A05	10.89	10.89	0
25 YR 72 HR	N-ADE-A05x	9.15	8.86	-0.29
25 YR 72 HR	N-ADE-A06	11.25	11.25	0
25 YR 72 HR	N-ADE-B02	7.3	6.16	-1.14
25 YR 72 HR	N-ADE-B03	7.3	6.16	-1.14
25 YR 72 HR	N-ADE-C02	7.77	5.91	-1.86
25 YR 72 HR	N-ADE-C03	7.78	6.08	-1.7
25 YR 72 HR	N-ADE-D03	7.28	6.18	-1.1
25 YR 72 HR	N-ADS-A01	6.41	6.39	-0.02
25 YR 72 HR	N-ADS-A02	6.41	6.39	-0.02
25 YR 72 HR	N-ASA-A01	5.51	3.69	-1.82
25 YR 72 HR	N-ASA-A02	5.51	3.69	-1.82
25 YR 72 HR	N-ASA-A03	5.78	3.75	-2.03
25 YR 72 HR	N-ASA-A04	5.92	3.8	-2.12
25 YR 72 HR	N-ASA-A05	6.09	3.88	-2.21
25 YR 72 HR	N-ASA-A06	6.17	3.96	-2.21
25 YR 72 HR	N-ASA-A07	6.19	3.97	-2.22
25 YR 72 HR	N-ASB-A01	5.59	3.95	-1.64
25 YR 72 HR	N-ASB-A02	5.59	3.87	-1.72
25 YR 72 HR	N-ASB-B02	5.83	3.95	-1.88
25 YR 72 HR	N-ASC-A01	5.68	4.19	-1.49
25 YR 72 HR	N-ASC-A02	6.83	5.3	-1.53
25 YR 72 HR	N-ASC-A03	7.11	5.37	-1.74

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Area A Long Range Alternatives Unselected Alternative (2A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASC-A04	7.12	5.42	-1.7
25 YR 72 HR	N-ASC-B02	6.17	4.12	-2.05
25 YR 72 HR	N-ASC-B03	6.26	4.16	-2.1
25 YR 72 HR	N-ASD-A01a	6.3	7.11	0.81
25 YR 72 HR	N-ASD-A02	8.51	9.02	0.51
25 YR 72 HR	N-ASD-A03	9.34	9.71	0.37
25 YR 72 HR	N-ASD-A04	10.42	10.59	0.17
25 YR 72 HR	N-ASD-A05	10.77	10.91	0.14
25 YR 72 HR	N-ASD-A06	11.44	11.54	0.1
25 YR 72 HR	N-ASD-A07	11.89	11.97	0.08
25 YR 72 HR	N-ASD-A08	12.44	12.49	0.05
25 YR 72 HR	N-ASD-A09	13.17	13.19	0.02
25 YR 72 HR	N-ASD-A11	14.09	14.1	0.01
25 YR 72 HR	N-ASD-A12	15.03	15.03	0
25 YR 72 HR	N-ASD-A13	15.62	15.62	0
25 YR 72 HR	N-ASD-A14	15.92	15.92	0
25 YR 72 HR	N-ASD-A15	16.41	16.41	0
25 YR 72 HR	N-ASD-A16	14.31	14.31	0
25 YR 72 HR	N-ASD-A17	16.62	16.62	0
25 YR 72 HR	N-ASD-A18	15.58	15.58	0
25 YR 72 HR	N-ASD-A19	14.93	14.93	0
25 YR 72 HR	N-ASD-B02	6.43	7.21	0.78
25 YR 72 HR	N-ASD-B03	7.84	7.86	0.02
25 YR 72 HR	N-ASD-B04	8.09	8.19	0.1
25 YR 72 HR	N-ASD-B05	8.8	8.56	-0.24
25 YR 72 HR	N-ASD-C03	8.95	8.98	0.03
25 YR 72 HR	N-ASD-C04	7.11	7.29	0.18
25 YR 72 HR	N-ASD-D04	8.96	8.98	0.02
25 YR 72 HR	N-ASD-D05	9	9.02	0.02
25 YR 72 HR	N-ASD-D06	8.77	8.77	0
25 YR 72 HR	N-ASD-D07	9.07	9.08	0.01
25 YR 72 HR	N-ASD-E04	9.84	10.13	0.29
25 YR 72 HR	N-ASD-E05	10.78	10.93	0.15
25 YR 72 HR	N-ASD-E06	10.98	11.12	0.14
25 YR 72 HR	N-ASD-E09	14.21	14.22	0.01
25 YR 72 HR	N-ASD-E10	13.9	13.91	0.01
25 YR 72 HR	N-ASD-F03	9	9.08	0.08
25 YR 72 HR	N-ASD-F04	9.28	9.23	-0.05
25 YR 72 HR	N-ASD-F05	9.69	9.67	-0.02
25 YR 72 HR	N-ASD-G04	9.35	9.71	0.36
25 YR 72 HR	N-ASD-H07	9.55	9.55	0
25 YR 72 HR	N-ASD-H08	9.55	9.55	0
25 YR 72 HR	N-ASD-I09	10.9	10.9	0
25 YR 72 HR	N-ASD-J10	12.54	12.54	0

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Area A Long Range Alternatives Unselected Alternative (2A)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASD-K10	13.9	13.91	0.01
25 YR 72 HR	N-ASD-L07	11.3	11.31	0.01
25 YR 72 HR	N-ASD-Q06	10.93	11.07	0.14
25 YR 72 HR	N-ASD-Q08	11.7	11.78	0.08
25 YR 72 HR	N-ASD-Q09	12.78	12.8	0.02
25 YR 72 HR	N-ASD-R13	14.25	14.25	0
25 YR 72 HR	N-ASD-S13	14.85	14.85	0
25 YR 72 HR	N-ASD-T15	16.56	16.56	0
25 YR 72 HR	N-ASD-U06	10.79	10.94	0.15
25 YR 72 HR	N-ASE-A01	6.11	6.65	0.54
25 YR 72 HR	N-ASE-A02	6.38	7.2	0.82
25 YR 72 HR	N-ASE-A03	9.1	7.87	-1.23
25 YR 72 HR	N-ASE-A04	9.11	7.88	-1.23
25 YR 72 HR	N-ASE-A05	11.45	11.45	0
25 YR 72 HR	N-ASE-B02	6.14	6.66	0.52
25 YR 72 HR	N-ASE-C03	7.04	8.14	1.1
25 YR 72 HR	N-ASE-D03	7.87	8.15	0.28
25 YR 72 HR	N-ASF-A01	6.47	5.89	-0.58
25 YR 72 HR	N-ASF-A02	6.47	5.9	-0.57
25 YR 72 HR	N-ASG-A01	5.93	5.94	0.01
25 YR 72 HR	N-ASG-A02	6.27	6.02	-0.25
25 YR 72 HR	N-ASG-A03	6.8	6.05	-0.75
25 YR 72 HR	N-ASG-A04	7.46	6.12	-1.34
25 YR 72 HR	N-ASG-A05	7.46	6.16	-1.3
25 YR 72 HR	N-ASG-A06	7.13	7.13	0
25 YR 72 HR	N-ASG-B02	5.94	5.94	0
25 YR 72 HR	N-ASG-B03x	5.94	5.94	0
25 YR 72 HR	N-ASG-C04	6.54	6.16	-0.38
25 YR 72 HR	N-ASG-C05	6.45	6.22	-0.23
25 YR 72 HR	N-ASH-A01	5.94	5.93	-0.01
25 YR 72 HR	N-ASH-A02	5.94	5.94	0
25 YR 72 HR	N-ASI-A01	5.47	5.58	0.11
25 YR 72 HR	N-ASJ	1.59	4.4	2.81
25 YR 72 HR	N-ASJ-A01	5.71	5.87	0.16
25 YR 72 HR	N-ASK-A01	5.55	5.9	0.35

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Area BCDE Long Range Alternative (2BC,3D,1E)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	9thSt-Node	#N/A	4.4	#N/A
10 yr 1 hr	B-Pump Node	#N/A	4.4	#N/A
10 yr 1 hr	B-Pump Node 2	#N/A	4.4	#N/A
10 yr 1 hr	N-BA	1.59	4.4	2.81
10 yr 1 hr	N-BA-A01	3.33	4.4	1.07
10 yr 1 hr	N-BA-A02	3.37	4.41	1.04
10 yr 1 hr	N-BA-A03	3.4	4.42	1.02
10 yr 1 hr	N-BA-A03x	3.37	4.41	1.04
10 yr 1 hr	N-BA-A04	3.46	4.43	0.97
10 yr 1 hr	N-BA-A04x	3.4	4.42	1.02
10 yr 1 hr	N-BA-A05	3.46	4.44	0.98
10 yr 1 hr	N-BA-A06	3.58	4.44	0.86
10 yr 1 hr	N-BA-A07	3.65	4.44	0.79
10 yr 1 hr	N-BA-A07x	3.61	4.45	0.84
10 yr 1 hr	N-BA-A08	3.76	4.45	0.69
10 yr 1 hr	N-BA-A08x	3.65	4.45	0.8
10 yr 1 hr	N-BA-A09	3.91	4.72	0.81
10 yr 1 hr	N-BA-B02	3.26	4.4	1.14
10 yr 1 hr	N-BA-B03	3.26	4.4	1.14
10 yr 1 hr	N-BA-B04	3.25	4.4	1.15
10 yr 1 hr	N-BA-C03	3.33	4.41	1.08
10 yr 1 hr	N-BA-C04	3.32	4.41	1.09
10 yr 1 hr	N-BA-D05	3.48	4.44	0.96
10 yr 1 hr	N-BA-D06	3.49	4.44	0.95
10 yr 1 hr	N-BA-D07	3.65	4.45	0.8
10 yr 1 hr	N-BA-D08	3.72	4.45	0.73
10 yr 1 hr	N-BA-E09	3.76	4.45	0.69
10 yr 1 hr	N-BA-F09	3.87	4.44	0.57
10 yr 1 hr	N-BA-K04	3.39	4.43	1.04
10 yr 1 hr	N-BA-K05	3.41	4.44	1.03
10 yr 1 hr	N-BA-K06	3.6	4.44	0.84
10 yr 1 hr	N-BA-K08	5.06	5.09	0.03
10 yr 1 hr	N-BA-L06	3.54	4.44	0.9
10 yr 1 hr	N-BA-Q05	3.38	4.42	1.04
10 yr 1 hr	N-BA-Q06	3.38	4.42	1.04
10 yr 1 hr	N-BA-Q06x	3.38	4.42	1.04
10 yr 1 hr	N-BA-Q07	3.38	4.42	1.04
10 yr 1 hr	N-BA-Q07x	3.37	4.42	1.05
10 yr 1 hr	N-BA-Q08	3.39	4.43	1.04
10 yr 1 hr	N-BA-R06	3.39	4.43	1.04
10 yr 1 hr	N-BA-R07	3.38	4.43	1.05
10 yr 1 hr	N-BA-R07x	3.4	4.43	1.03
10 yr 1 hr	N-BA-R08	3.38	4.42	1.04
10 yr 1 hr	N-BA-R08x	3.39	4.43	1.04

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA-R09	3.38	4.43	1.05
10 yr 1 hr	N-BA-R10	3.38	4.42	1.04
10 yr 1 hr	N-BA-R11	3.37	4.42	1.05
10 yr 1 hr	N-BA-S06a	3.68	4.47	0.79
10 yr 1 hr	N-BA-T07	3.69	4.44	0.75
10 yr 1 hr	N-BA-T08	3.68	4.44	0.76
10 yr 1 hr	N-BA-T08x	3.69	4.44	0.75
10 yr 1 hr	N-BA-T09	3.4	4.43	1.03
10 yr 1 hr	N-BA-T09x	3.68	4.43	0.75
10 yr 1 hr	N-BA-T10	3.4	4.43	1.03
10 yr 1 hr	N-BA-U02	3.32	4.41	1.09
10 yr 1 hr	N-BA-U03	3.33	4.41	1.08
10 yr 1 hr	N-BA-V07	3.75	4.44	0.69
10 yr 1 hr	N-BA-W08	4.19	4.59	0.4
10 yr 1 hr	N-BA-W09A	4.2	4.6	0.4
10 yr 1 hr	N-BA-W09B	4.17	4.56	0.39
10 yr 1 hr	N-BB	1.59	4.4	2.81
10 yr 1 hr	N-BB-A01	3.32	4.41	1.09
10 yr 1 hr	N-BB-A02	3.33	4.42	1.09
10 yr 1 hr	N-BB-A03	3.31	4.41	1.1
10 yr 1 hr	N-BB-A04	3.32	4.41	1.09
10 yr 1 hr	N-BC	1.59	4.4	2.81
10 yr 1 hr	N-BC-A01	2.39	4.41	2.02
10 yr 1 hr	N-BC-A02	4.78	4.74	-0.04
10 yr 1 hr	N-BD	1.59	4.4	2.81
10 yr 1 hr	N-BD-A01	3.33	4.4	1.07
10 yr 1 hr	N-BD-A02	3.36	4.41	1.05
10 yr 1 hr	N-BD-A02x	3.37	4.41	1.04
10 yr 1 hr	N-BD-A03	3.37	4.41	1.04
10 yr 1 hr	N-BD-A05	3.37	4.41	1.04
10 yr 1 hr	N-BD-B02	3.33	4.4	1.07
10 yr 1 hr	N-BD-B03	3.32	4.4	1.08
10 yr 1 hr	N-BD-B04	3.32	4.4	1.08
10 yr 1 hr	N-BD-B04x	3.32	4.4	1.08
10 yr 1 hr	N-BE	1.59	4.4	2.81
10 yr 1 hr	N-BE-A01	3.31	4.41	1.1
10 yr 1 hr	N-BE-A03	3.39	4.43	1.04
10 yr 1 hr	N-BE-A04	3.4	4.43	1.03
10 yr 1 hr	N-BF	1.59	4.4	2.81
10 yr 1 hr	N-BF-A01	3.9	4.48	0.58
10 yr 1 hr	N-BG	#N/A	4.4	#N/A
10 yr 1 hr	N-CA	1.59	4.4	2.81
10 yr 1 hr	N-CA-A01c	5.81	5.05	-0.76
10 yr 1 hr	N-CA-A01d	3.23	4.4	1.17

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-A02	3.35	4.4	1.05
10 yr 1 hr	N-CA-A03	3.37	4.41	1.04
10 yr 1 hr	N-CA-A04	3.4	4.41	1.01
10 yr 1 hr	N-CA-A05	3.41	4.42	1.01
10 yr 1 hr	N-CA-A07	4.72	4.91	0.19
10 yr 1 hr	N-CA-B03	3.36	4.41	1.05
10 yr 1 hr	N-CA-B04	3.38	4.42	1.04
10 yr 1 hr	N-CA-B07	4.35	4.84	0.49
10 yr 1 hr	N-CA-C03	3.13	4.4	1.27
10 yr 1 hr	N-CA-C04	3.11	4.4	1.29
10 yr 1 hr	N-CA-C05	3.14	4.4	1.26
10 yr 1 hr	N-CA-D06	3.62	4.42	0.8
10 yr 1 hr	N-CA-D07	3.62	4.42	0.8
10 yr 1 hr	N-CA-D07x	3.79	4.42	0.63
10 yr 1 hr	N-CA-D08	3.13	4.42	1.29
10 yr 1 hr	N-CA-D08x	3.64	4.43	0.79
10 yr 1 hr	N-CA-D09x	3.13	4.43	1.3
10 yr 1 hr	N-CA-E07	4.42	4.88	0.46
10 yr 1 hr	N-CA-E08	4.43	4.9	0.47
10 yr 1 hr	N-CA-E09x	4.57	4.9	0.33
10 yr 1 hr	N-CA-F04	3.37	4.41	1.04
10 yr 1 hr	N-CA-F05	3.09	4.41	1.32
10 yr 1 hr	N-CA-F05x	3.19	4.41	1.22
10 yr 1 hr	N-CA-F06	3.08	4.41	1.33
10 yr 1 hr	N-CA-F06x	3.07	4.41	1.34
10 yr 1 hr	N-CA-F07	3.08	4.41	1.33
10 yr 1 hr	N-CA-F07x	3.07	4.4	1.33
10 yr 1 hr	N-CA-F08	3.09	4.41	1.32
10 yr 1 hr	N-CA-F09	3.09	4.41	1.32
10 yr 1 hr	N-CA-F09x	3.09	4.41	1.32
10 yr 1 hr	N-CA-F10	3.1	4.41	1.31
10 yr 1 hr	N-CA-F11	3.1	4.41	1.31
10 yr 1 hr	N-CA-F11x	3.09	4.41	1.32
10 yr 1 hr	N-CA-F12	3.1	4.41	1.31
10 yr 1 hr	N-CA-F12x	3.1	4.41	1.31
10 yr 1 hr	N-CA-G08	3.1	4.42	1.32
10 yr 1 hr	N-CA-G09	3.1	4.42	1.32
10 yr 1 hr	N-CA-G10	3.39	4.42	1.03
10 yr 1 hr	N-CA-G11x	3.37	4.42	1.05
10 yr 1 hr	N-CA-H09	3.1	4.42	1.32
10 yr 1 hr	N-CA-H10	3.1	4.42	1.32
10 yr 1 hr	N-CA-H10x	3.1	4.42	1.32
10 yr 1 hr	N-CA-H11	3.12	4.42	1.3
10 yr 1 hr	N-CA-H11x	3.1	4.42	1.32

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-H12	3.12	4.42	1.3
10 yr 1 hr	N-CA-H13	3.24	4.43	1.19
10 yr 1 hr	N-CA-H14	3.32	4.43	1.11
10 yr 1 hr	N-CA-I12	3.12	4.42	1.3
10 yr 1 hr	N-CA-I13	3.12	4.42	1.3
10 yr 1 hr	N-CA-I14	3.12	4.42	1.3
10 yr 1 hr	N-CA-J14	3.26	4.43	1.17
10 yr 1 hr	N-CA-J15x	3.3	4.43	1.13
10 yr 1 hr	N-CA-K03	3.36	4.41	1.05
10 yr 1 hr	N-CA-L04	3.38	4.41	1.03
10 yr 1 hr	N-CA-L05	3.52	4.43	0.91
10 yr 1 hr	N-CA-M06	3.55	4.43	0.88
10 yr 1 hr	N-CA-N05	3.57	4.42	0.85
10 yr 1 hr	N-CA-O08	4.93	4.92	-0.01
10 yr 1 hr	N-CA-S05	3.23	4.41	1.18
10 yr 1 hr	N-CA-T08	3.06	4.41	1.35
10 yr 1 hr	N-CA-T09	3.06	4.41	1.35
10 yr 1 hr	N-CB	1.59	4.4	2.81
10 yr 1 hr	N-CB-A01	3	4.4	1.4
10 yr 1 hr	N-CB-A02	#N/A	4.4	#N/A
10 yr 1 hr	N-CB-Added	#N/A	4.4	#N/A
10 yr 1 hr	N-CC	1.59	4.4	2.81
10 yr 1 hr	N-CC-A01	2.81	4.4	1.59
10 yr 1 hr	N-CC-A02	2.84	4.4	1.56
10 yr 1 hr	N-CC-A03	3.06	4.4	1.34
10 yr 1 hr	N-CE	1.59	4.4	2.81
10 yr 1 hr	N-CE-A01	3.1	4.41	1.31
10 yr 1 hr	N-CE-A02	3.1	4.42	1.32
10 yr 1 hr	N-CE-A03	3.1	4.42	1.32
10 yr 1 hr	N-CF	1.59	4.4	2.81
10 yr 1 hr	N-CF-A01	3.12	4.42	1.3
10 yr 1 hr	N-CF-A02	3.12	4.42	1.3
10 yr 1 hr	N-CF-A03x	3.12	4.42	1.3
10 yr 1 hr	N-CG	1.59	4.4	2.81
10 yr 1 hr	N-CG-A01	3.12	4.41	1.29
10 yr 1 hr	N-CG-A02x	3.12	4.42	1.3
10 yr 1 hr	N-CG-A03x	3.26	4.42	1.16
10 yr 1 hr	N-CH	1.59	4.4	2.81
10 yr 1 hr	N-CH-A01b	1.81	4.4	2.59
10 yr 1 hr	N-CH-A02	2.23	4.4	2.17
10 yr 1 hr	N-CH-A03	3.64	4.41	0.77
10 yr 1 hr	N-CH-A04	3.76	4.42	0.66
10 yr 1 hr	N-CH-Added	#N/A	4.4	#N/A
10 yr 1 hr	N-CH-B02	2.87	4.4	1.53

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CH-B03	3.84	4.43	0.59
10 yr 1 hr	N-CH-B03x	2.89	4.4	1.51
10 yr 1 hr	N-CH-B04	3.91	4.44	0.53
10 yr 1 hr	N-CH-B04x	4.04	4.46	0.42
10 yr 1 hr	N-CH-B05	4.72	4.63	-0.09
10 yr 1 hr	N-CH-B05x	3.99	4.46	0.47
10 yr 1 hr	N-CH-B06	4.88	4.87	-0.01
10 yr 1 hr	N-CH-B06x	4.82	4.81	-0.01
10 yr 1 hr	N-CH-B07	5.89	5.89	0
10 yr 1 hr	N-CH-C04	3.75	4.42	0.67
10 yr 1 hr	N-CH-C05	3.77	4.43	0.66
10 yr 1 hr	N-CH-C05x1	3.77	4.42	0.65
10 yr 1 hr	N-CH-C05x2	3.77	4.42	0.65
10 yr 1 hr	N-CH-C05x3	3.77	4.42	0.65
10 yr 1 hr	N-CH-C06	3.78	4.43	0.65
10 yr 1 hr	N-CH-C06x	3.77	4.43	0.66
10 yr 1 hr	N-CH-C07x	3.77	4.43	0.66
10 yr 1 hr	N-CH-D05	3.77	4.42	0.65
10 yr 1 hr	N-CH-D06	3.77	4.42	0.65
10 yr 1 hr	N-CH-D08x	3.77	4.42	0.65
10 yr 1 hr	N-CH-E06	3.78	4.43	0.65
10 yr 1 hr	N-CH-E07	3.78	4.43	0.65
10 yr 1 hr	N-CH-F07	3.78	4.43	0.65
10 yr 1 hr	N-CH-F08	3.78	4.43	0.65
10 yr 1 hr	N-CH-G07	3.77	4.42	0.65
10 yr 1 hr	N-CH-G08	3.77	4.41	0.64
10 yr 1 hr	N-CH-G09	3.77	4.41	0.64
10 yr 1 hr	N-CH-G10	3.77	4.41	0.64
10 yr 1 hr	N-CH-G11	3.77	4.41	0.64
10 yr 1 hr	N-CH-I04	3.73	4.41	0.68
10 yr 1 hr	N-CH-I05x1	3.76	4.41	0.65
10 yr 1 hr	N-CH-I05x2	3.76	4.41	0.65
10 yr 1 hr	N-CH-I05x3	3.76	4.41	0.65
10 yr 1 hr	N-CH-I05x4	3.76	4.41	0.65
10 yr 1 hr	N-CI	1.59	4.4	2.81
10 yr 1 hr	N-D10	3.77	4.42	0.65
10 yr 1 hr	N-D16	2.53	4.4	1.87
10 yr 1 hr	N-D19	4.78	4.7	-0.08
10 yr 1 hr	N-D20	4.77	4.67	-0.1
10 yr 1 hr	N-D22	4.79	4.84	0.05
10 yr 1 hr	N-D30	4.76	4.65	-0.11
10 yr 1 hr	N-DA	1.59	4.4	2.81
10 yr 1 hr	N-DA-A01	3.36	4.42	1.06
10 yr 1 hr	N-DB	1.59	4.4	2.81

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Area BCDE Long Range Alternative (2BC,3D,1E)
10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DC	1.59	4.4	2.81
10 yr 1 hr	N-DI-A01	3.51	4.42	0.91
10 yr 1 hr	N-DI-A02	3.52	4.43	0.91
10 yr 1 hr	N-DI-B04	4.27	4.46	0.19
10 yr 1 hr	N-DI-B05	4.03	4.46	0.43
10 yr 1 hr	N-DI-B05x	4.71	4.56	-0.15
10 yr 1 hr	N-DI-B06	4.04	4.46	0.42
10 yr 1 hr	N-DI-B07	4.72	4.53	-0.19
10 yr 1 hr	N-DI-B08	4.72	4.56	-0.16
10 yr 1 hr	N-DI-B09	4.73	4.59	-0.14
10 yr 1 hr	N-DI-B10	4.75	4.64	-0.11
10 yr 1 hr	N-DI-B10x	4.73	4.59	-0.14
10 yr 1 hr	N-DI-B11	4.74	4.63	-0.11
10 yr 1 hr	N-DI-C03	3.55	4.45	0.9
10 yr 1 hr	N-DI-C04	4.78	4.84	0.06
10 yr 1 hr	N-DI-C05	4.52	4.52	0
10 yr 1 hr	N-DP	4.17	4.4	0.23
10 yr 1 hr	N-DP-A01	4.32	4.4	0.08
10 yr 1 hr	N-DP-A02	4.36	4.44	0.08
10 yr 1 hr	N-DP-A04	4.39	4.45	0.06
10 yr 1 hr	N-DP-A07	4.77	4.67	-0.1
10 yr 1 hr	N-DP-A08	4.77	4.67	-0.1
10 yr 1 hr	N-DP-A09	4.77	4.66	-0.11
10 yr 1 hr	N-DP-A09x	4.77	4.67	-0.1
10 yr 1 hr	N-DP-A10	4.76	4.65	-0.11
10 yr 1 hr	N-DP-A11x	4.76	4.66	-0.1
10 yr 1 hr	N-DP-B2	4.35	4.43	0.08
10 yr 1 hr	N-DP-C02	4.37	4.4	0.03
10 yr 1 hr	N-DP-C03	3.36	4.42	1.06
10 yr 1 hr	N-DP-C03x	4.37	4.4	0.03
10 yr 1 hr	N-DP-D02	4.43	4.43	0
10 yr 1 hr	N-DP-D03x	4.82	4.85	0.03
10 yr 1 hr	N-DP-D04	4.59	4.58	-0.01
10 yr 1 hr	N-DP-D05x	4.64	4.65	0.01
10 yr 1 hr	N-DP-D06x	4.71	4.77	0.06
10 yr 1 hr	N-DP-D07x	4.81	4.83	0.02
10 yr 1 hr	N-DP-D08x	4.89	4.87	-0.02
10 yr 1 hr	N-DP-D09	5.01	4.95	-0.06
10 yr 1 hr	N-DP-D10	5.4	5.42	0.02
10 yr 1 hr	N-DP-E05	4.74	4.64	-0.1
10 yr 1 hr	N-DP-E06	4.86	4.86	0
10 yr 1 hr	N-DP-E08	4.78	4.7	-0.08
10 yr 1 hr	N-DP-F07	5.1	5.4	0.3
10 yr 1 hr	N-DP-F08	4.94	4.88	-0.06

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DP-F09	4.96	5.03	0.07
10 yr 1 hr	N-DP-G05	4.36	4.45	0.09
10 yr 1 hr	N-DP-G06	4.36	4.46	0.1
10 yr 1 hr	N-DP-G07	4.36	4.48	0.12
10 yr 1 hr	N-DP-G07x	4.35	4.46	0.11
10 yr 1 hr	N-DP-G08	4.39	4.65	0.26
10 yr 1 hr	N-DP-G08x	4.36	4.49	0.13
10 yr 1 hr	N-DP-H04	4.36	4.44	0.08
10 yr 1 hr	N-DP-H05	4.36	4.44	0.08
10 yr 1 hr	N-DP-H05x	4.36	4.44	0.08
10 yr 1 hr	N-DP-H06	4.35	4.45	0.1
10 yr 1 hr	N-DP-H06x	4.36	4.45	0.09
10 yr 1 hr	N-DP-K07	4.36	4.45	0.09
10 yr 1 hr	N-DP-M10	5.11	5.02	-0.09
10 yr 1 hr	N-DP-M11	5.2	5.01	-0.19
10 yr 1 hr	N-DP-M12	5.25	5.21	-0.04
10 yr 1 hr	N-DP-N10	4.89	4.89	0
10 yr 1 hr	N-DP-O10	4.77	4.67	-0.1
10 yr 1 hr	N-DP-O11	4.88	4.76	-0.12
10 yr 1 hr	N-DP-P06	4.6	4.65	0.05
10 yr 1 hr	N-DP-Y03	5.11	5.12	0.01
10 yr 1 hr	N-DP-Z12	4.26	4.5	0.24
10 yr 1 hr	N-DQ-A01	4.33	4.45	0.12
10 yr 1 hr	N-DQ-A01x	#N/A	4.45	#N/A
10 yr 1 hr	N-DQ-A02	4.34	4.45	0.11
10 yr 1 hr	N-DQ-A03	4.33	4.44	0.11
10 yr 1 hr	N-DQ-A03x	2.94	4.41	1.47
10 yr 1 hr	N-DQ-A04	5.32	5.6	0.28
10 yr 1 hr	N-DQ-A05	4.03	4.42	0.39
10 yr 1 hr	N-DQ-A06	4.33	4.45	0.12
10 yr 1 hr	N-DQ-A07	4.33	4.44	0.11
10 yr 1 hr	N-DQ-A08	4.33	4.45	0.12
10 yr 1 hr	N-E01	2.9	4.4	1.5
10 yr 1 hr	N-E02	3.35	4.4	1.05
10 yr 1 hr	N-E03	4	4.4	0.4
10 yr 1 hr	N-E07	4.49	4.53	0.04
10 yr 1 hr	N-E08	3.78	4.4	0.62
10 yr 1 hr	N-E10	3.71	4.4	0.69
10 yr 1 hr	N-E11	1.83	4.4	2.57
10 yr 1 hr	N-EA	1.59	4.4	2.81
10 yr 1 hr	N-EA-A01	3.81	4.41	0.6
10 yr 1 hr	N-EA-A02	3.81	4.41	0.6
10 yr 1 hr	N-EB	1.59	4.4	2.81
10 yr 1 hr	N-EB-A01	2.52	4.4	1.88

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-EC	1.59	4.4	2.81
10 yr 1 hr	N-EC-A01	2.69	4.4	1.71
10 yr 1 hr	N-ED	1.59	4.4	2.81
10 yr 1 hr	N-ED-A01	3.24	4.41	1.17
10 yr 1 hr	N-ED-A02	3.41	4.4	0.99
10 yr 1 hr	N-ED-A03	3.51	4.4	0.89
10 yr 1 hr	N-EE	1.59	4.4	2.81
10 yr 1 hr	N-EE-A01	3.66	4.4	0.74
10 yr 1 hr	N-EF	1.59	4.4	2.81
10 yr 1 hr	N-EF-A01	3.11	4.4	1.29
10 yr 1 hr	N-EG	1.59	4.4	2.81
10 yr 1 hr	N-EG-A01	3.43	4.4	0.97
10 yr 1 hr	N-EG-A02	3.62	4.4	0.78
10 yr 1 hr	N-EH	1.59	4.4	2.81
10 yr 1 hr	N-EH-A01	1.77	4.4	2.63
10 yr 1 hr	N-EI	1.59	4.4	2.81
10 yr 1 hr	N-EJ	1.59	4.4	2.81
10 yr 1 hr	N-EJ-A01	1.61	4.4	2.79
10 yr 1 hr	N-EK	1.59	4.4	2.81
10 yr 1 hr	N-EK-A01	3.68	4.4	0.72
10 yr 1 hr	N-EL	1.59	4.4	2.81
10 yr 1 hr	N-EL-A01	3.01	4.4	1.39
10 yr 1 hr	N-EM	1.59	4.4	2.81
10 yr 1 hr	N-EM-A01	2.63	4.4	1.77
10 yr 1 hr	N-EM-A02	2.61	4.4	1.79
10 yr 1 hr	N-EM-A03	2	4.4	2.4
10 yr 1 hr	N-EN	1.59	4.4	2.81
10 yr 1 hr	N-EN-A01	2.83	4.4	1.57
10 yr 1 hr	N-EO	1.59	4.4	2.81
10 yr 1 hr	N-EO-A01	2.22	4.4	2.18
10 yr 1 hr	N-EP	1.59	4.4	2.81
10 yr 1 hr	N-EP-A01	1.98	4.4	2.42
10 yr 1 hr	N-EQ	1.59	4.4	2.81
10 yr 1 hr	N-EQ-A01	1.65	4.41	2.76
10 yr 1 hr	N-ER	1.59	4.4	2.81
10 yr 1 hr	N-ES	1.59	4.4	2.81
10 yr 1 hr	N-ET	1.59	4.4	2.81
10 yr 1 hr	N-ET-A01	1.59	4.4	2.81
10 yr 1 hr	N-Pump-C3	#N/A	4.4	#N/A
10 yr 1 hr	Trunkline-Junction-1	#N/A	4.4	#N/A

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Area BCDE Long Range Alternatives Selected Alternative (2BC,3D,1E)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	9thSt-Node	#N/A	1.73	#N/A
25 yr 72 hr	AltAdd-04-DSJ	#N/A	0.3	#N/A
25 yr 72 hr	B-Pump Node	#N/A	-6	#N/A
25 yr 72 hr	B-Pump Node 2	#N/A	1.9	#N/A
25 yr 72 hr	N-BA	1.59	4.4	2.81
25 yr 72 hr	N-BA-A01	3.55	2.43	-1.12
25 yr 72 hr	N-BA-A02	3.6	2.98	-0.62
25 yr 72 hr	N-BA-A03	3.64	3.19	-0.45
25 yr 72 hr	N-BA-A03x	3.6	3	-0.6
25 yr 72 hr	N-BA-A04	3.71	3.35	-0.36
25 yr 72 hr	N-BA-A04x	3.63	3.18	-0.45
25 yr 72 hr	N-BA-A05	3.72	3.37	-0.35
25 yr 72 hr	N-BA-A06	3.78	3.5	-0.28
25 yr 72 hr	N-BA-A07	3.82	3.56	-0.26
25 yr 72 hr	N-BA-A07x	3.81	3.55	-0.26
25 yr 72 hr	N-BA-A08	3.83	3.56	-0.27
25 yr 72 hr	N-BA-A08x	3.82	3.57	-0.25
25 yr 72 hr	N-BA-A09	4.01	4.3	0.29
25 yr 72 hr	N-BA-B02	3.41	2.6	-0.81
25 yr 72 hr	N-BA-B03	3.41	2.62	-0.79
25 yr 72 hr	N-BA-B04	3.39	2.63	-0.76
25 yr 72 hr	N-BA-C03	3.57	2.83	-0.74
25 yr 72 hr	N-BA-C04	3.57	2.59	-0.98
25 yr 72 hr	N-BA-D05	3.73	3.37	-0.36
25 yr 72 hr	N-BA-D06	3.75	3.4	-0.35
25 yr 72 hr	N-BA-D07	3.85	3.65	-0.2
25 yr 72 hr	N-BA-D08	3.89	3.68	-0.21
25 yr 72 hr	N-BA-E09	3.83	3.57	-0.26
25 yr 72 hr	N-BA-F09	3.88	3.6	-0.28
25 yr 72 hr	N-BA-K04	3.69	3.04	-0.65
25 yr 72 hr	N-BA-K05	3.72	3.44	-0.28
25 yr 72 hr	N-BA-K06	3.78	3.73	-0.05
25 yr 72 hr	N-BA-K08	5.08	5.08	0
25 yr 72 hr	N-BA-L06	3.76	3.63	-0.13
25 yr 72 hr	N-BA-Q05	3.67	2.09	-1.58
25 yr 72 hr	N-BA-Q06	3.66	2.18	-1.48
25 yr 72 hr	N-BA-Q06x	3.67	1.94	-1.73
25 yr 72 hr	N-BA-Q07	3.68	2.32	-1.36
25 yr 72 hr	N-BA-Q07x	3.66	2.18	-1.48
25 yr 72 hr	N-BA-Q08	3.68	2.81	-0.87
25 yr 72 hr	N-BA-R06	3.69	3.03	-0.66
25 yr 72 hr	N-BA-R07	3.68	2.38	-1.3
25 yr 72 hr	N-BA-R07x	3.7	3.17	-0.53
25 yr 72 hr	N-BA-R08	3.66	1.89	-1.77

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA-R08x	3.68	2.38	-1.3
25 yr 72 hr	N-BA-R09	3.67	2.34	-1.33
25 yr 72 hr	N-BA-R10	3.67	2.45	-1.22
25 yr 72 hr	N-BA-R11	3.65	2.45	-1.2
25 yr 72 hr	N-BA-S06a	3.94	3.82	-0.12
25 yr 72 hr	N-BA-T07	3.73	3.52	-0.21
25 yr 72 hr	N-BA-T08	3.72	3.51	-0.21
25 yr 72 hr	N-BA-T08x	3.73	3.52	-0.21
25 yr 72 hr	N-BA-T09	3.69	3.39	-0.3
25 yr 72 hr	N-BA-T09x	3.71	3.51	-0.2
25 yr 72 hr	N-BA-T10	3.69	3.37	-0.32
25 yr 72 hr	N-BA-U02	3.55	2.75	-0.8
25 yr 72 hr	N-BA-U03	3.56	3	-0.56
25 yr 72 hr	N-BA-V07	3.8	3.78	-0.02
25 yr 72 hr	N-BA-W08	4.54	4.5	-0.04
25 yr 72 hr	N-BA-W09A	4.55	4.51	-0.04
25 yr 72 hr	N-BA-W09B	4.51	4.47	-0.04
25 yr 72 hr	N-BB	1.59	4.4	2.81
25 yr 72 hr	N-BB-A01	3.6	1.79	-1.81
25 yr 72 hr	N-BB-A02	3.59	1.87	-1.72
25 yr 72 hr	N-BB-A03	3.57	1.89	-1.68
25 yr 72 hr	N-BB-A04	3.58	1.89	-1.69
25 yr 72 hr	N-BC	1.59	4.4	2.81
25 yr 72 hr	N-BC-A01	2.54	2.25	-0.29
25 yr 72 hr	N-BC-A02	4.82	2.77	-2.05
25 yr 72 hr	N-BD	1.59	4.4	2.81
25 yr 72 hr	N-BD-A01	3.59	-0.05	-3.64
25 yr 72 hr	N-BD-A02	3.64	1.65	-1.99
25 yr 72 hr	N-BD-A02x	3.65	1.66	-1.99
25 yr 72 hr	N-BD-A03	3.65	1.73	-1.92
25 yr 72 hr	N-BD-A05	3.64	1.85	-1.79
25 yr 72 hr	N-BD-B02	3.59	0.04	-3.55
25 yr 72 hr	N-BD-B03	3.57	0.27	-3.3
25 yr 72 hr	N-BD-B04	3.64	2.61	-1.03
25 yr 72 hr	N-BD-B04x	3.57	1.72	-1.85
25 yr 72 hr	N-BE	1.59	4.4	2.81
25 yr 72 hr	N-BE-A01	3.56	3.03	-0.53
25 yr 72 hr	N-BE-A03	3.68	2.97	-0.71
25 yr 72 hr	N-BE-A04	3.68	2.99	-0.69
25 yr 72 hr	N-BF	1.59	4.4	2.81
25 yr 72 hr	N-BF-A01	4.06	4.05	-0.01
25 yr 72 hr	N-BG	#N/A	4.4	#N/A
25 yr 72 hr	N-CA	1.59	4.4	2.81
25 yr 72 hr	N-CA-A01c	5.81	5.05	-0.76

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Area BCDE Long Range Alternatives Selected Alternative (2BC,3D,1E)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-A01d	3.45	1.66	-1.79
25 yr 72 hr	N-CA-A02	3.58	2.78	-0.8
25 yr 72 hr	N-CA-A03	3.59	2.89	-0.7
25 yr 72 hr	N-CA-A04	3.6	3.13	-0.47
25 yr 72 hr	N-CA-A05	3.6	3.31	-0.29
25 yr 72 hr	N-CA-A07	5.04	5.18	0.14
25 yr 72 hr	N-CA-B03	3.59	2.95	-0.64
25 yr 72 hr	N-CA-B04	3.6	3.15	-0.45
25 yr 72 hr	N-CA-B07	4.7	4.56	-0.14
25 yr 72 hr	N-CA-C03	3.38	-0.08	-3.46
25 yr 72 hr	N-CA-C04	3.35	-0.08	-3.43
25 yr 72 hr	N-CA-C05	3.39	2.67	-0.72
25 yr 72 hr	N-CA-D06	3.64	3.59	-0.05
25 yr 72 hr	N-CA-D07	3.65	2.66	-0.99
25 yr 72 hr	N-CA-D07x	3.81	3.81	0
25 yr 72 hr	N-CA-D08	3.4	2.19	-1.21
25 yr 72 hr	N-CA-D08x	3.66	2.69	-0.97
25 yr 72 hr	N-CA-D09x	3.4	2.2	-1.2
25 yr 72 hr	N-CA-E07	4.8	4.58	-0.22
25 yr 72 hr	N-CA-E08	4.82	4.58	-0.24
25 yr 72 hr	N-CA-E09x	5.03	4.59	-0.44
25 yr 72 hr	N-CA-F04	3.56	0.51	-3.05
25 yr 72 hr	N-CA-F05	3.36	0.56	-2.8
25 yr 72 hr	N-CA-F05x	3.43	0.49	-2.94
25 yr 72 hr	N-CA-F06	3.35	0.51	-2.84
25 yr 72 hr	N-CA-F06x	3.33	0.57	-2.76
25 yr 72 hr	N-CA-F07	3.34	1.15	-2.19
25 yr 72 hr	N-CA-F07x	3.33	0.54	-2.79
25 yr 72 hr	N-CA-F08	3.36	1.52	-1.84
25 yr 72 hr	N-CA-F09	3.36	1.67	-1.69
25 yr 72 hr	N-CA-F09x	3.36	1.52	-1.84
25 yr 72 hr	N-CA-F10	3.37	1.85	-1.52
25 yr 72 hr	N-CA-F11	3.37	1.92	-1.45
25 yr 72 hr	N-CA-F11x	3.37	1.88	-1.49
25 yr 72 hr	N-CA-F12	3.37	1.92	-1.45
25 yr 72 hr	N-CA-F12x	3.37	1.95	-1.42
25 yr 72 hr	N-CA-G08	3.37	1.54	-1.83
25 yr 72 hr	N-CA-G09	3.38	1.59	-1.79
25 yr 72 hr	N-CA-G10	3.58	1.62	-1.96
25 yr 72 hr	N-CA-G11x	3.56	1.62	-1.94
25 yr 72 hr	N-CA-H09	3.38	1.86	-1.52
25 yr 72 hr	N-CA-H10	3.38	1.96	-1.42
25 yr 72 hr	N-CA-H10x	3.37	1.94	-1.43
25 yr 72 hr	N-CA-H11	3.39	2.12	-1.27

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-H11x	3.38	2.11	-1.27
25 yr 72 hr	N-CA-H12	3.39	2.13	-1.26
25 yr 72 hr	N-CA-H13	3.4	2.18	-1.22
25 yr 72 hr	N-CA-H14	3.41	2.23	-1.18
25 yr 72 hr	N-CA-I12	3.39	2.14	-1.25
25 yr 72 hr	N-CA-I13	3.39	2.15	-1.24
25 yr 72 hr	N-CA-I14	3.39	2.15	-1.24
25 yr 72 hr	N-CA-J14	3.4	2.19	-1.21
25 yr 72 hr	N-CA-J15x	3.4	2.23	-1.17
25 yr 72 hr	N-CA-K03	3.62	2.84	-0.78
25 yr 72 hr	N-CA-L04	3.6	3.16	-0.44
25 yr 72 hr	N-CA-L05	3.73	3.6	-0.13
25 yr 72 hr	N-CA-M06	3.77	3.59	-0.18
25 yr 72 hr	N-CA-N05	3.66	3.54	-0.12
25 yr 72 hr	N-CA-O08	4.98	5.01	0.03
25 yr 72 hr	N-CA-S05	3.41	0.52	-2.89
25 yr 72 hr	N-CA-T08	3.32	1.18	-2.14
25 yr 72 hr	N-CA-T09	3.32	1.18	-2.14
25 yr 72 hr	N-CB	1.59	4.4	2.81
25 yr 72 hr	N-CB-A01	3.19	-0.73	-3.92
25 yr 72 hr	N-CB-A02	#N/A	-0.1	#N/A
25 yr 72 hr	N-CB-Added	#N/A	-1.17	#N/A
25 yr 72 hr	N-CC	1.59	4.4	2.81
25 yr 72 hr	N-CC-A01	3.15	-0.08	-3.23
25 yr 72 hr	N-CC-A02	3.18	-0.08	-3.26
25 yr 72 hr	N-CC-A03	3.31	-0.09	-3.4
25 yr 72 hr	N-CE	1.59	4.4	2.81
25 yr 72 hr	N-CE-A01	3.37	2.39	-0.98
25 yr 72 hr	N-CE-A02	3.37	2.36	-1.01
25 yr 72 hr	N-CE-A03	3.37	2.36	-1.01
25 yr 72 hr	N-CF	1.59	4.4	2.81
25 yr 72 hr	N-CF-A01	3.38	2.15	-1.23
25 yr 72 hr	N-CF-A02	3.38	2.14	-1.24
25 yr 72 hr	N-CF-A03x	3.38	2.17	-1.21
25 yr 72 hr	N-CG	1.59	4.4	2.81
25 yr 72 hr	N-CG-A01	3.38	2.02	-1.36
25 yr 72 hr	N-CG-A02x	3.39	2.09	-1.3
25 yr 72 hr	N-CG-A03x	3.39	2.23	-1.16
25 yr 72 hr	N-CH	1.59	4.4	2.81
25 yr 72 hr	N-CH-A01b	1.88	-0.09	-1.97
25 yr 72 hr	N-CH-A02	2.75	0.1	-2.65
25 yr 72 hr	N-CH-A03	3.93	0.56	-3.37
25 yr 72 hr	N-CH-A04	4.03	0.57	-3.46
25 yr 72 hr	N-CH-Added	#N/A	-0.22	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CH-B02	2.96	0.59	-2.37
25 yr 72 hr	N-CH-B03	3.9	2.03	-1.87
25 yr 72 hr	N-CH-B03x	3.08	0.6	-2.48
25 yr 72 hr	N-CH-B04	3.94	2.81	-1.13
25 yr 72 hr	N-CH-B04x	4.12	2.28	-1.84
25 yr 72 hr	N-CH-B05	4.75	3.22	-1.53
25 yr 72 hr	N-CH-B05x	4.05	2.84	-1.21
25 yr 72 hr	N-CH-B06	4.88	4.75	-0.13
25 yr 72 hr	N-CH-B06x	4.83	3.62	-1.21
25 yr 72 hr	N-CH-B07	5.93	5.89	-0.04
25 yr 72 hr	N-CH-C04	4.02	0.81	-3.21
25 yr 72 hr	N-CH-C05	4.04	1.02	-3.02
25 yr 72 hr	N-CH-C05x1	4.03	0.83	-3.2
25 yr 72 hr	N-CH-C05x2	4.03	0.81	-3.22
25 yr 72 hr	N-CH-C05x3	4.03	0.81	-3.22
25 yr 72 hr	N-CH-C06	4.04	1.06	-2.98
25 yr 72 hr	N-CH-C06x	4.04	1.02	-3.02
25 yr 72 hr	N-CH-C07x	4.04	1.12	-2.92
25 yr 72 hr	N-CH-D05	4.03	0.87	-3.16
25 yr 72 hr	N-CH-D06	4.03	1.14	-2.89
25 yr 72 hr	N-CH-D08x	4.04	1.5	-2.54
25 yr 72 hr	N-CH-E06	4.04	1.18	-2.86
25 yr 72 hr	N-CH-E07	4.04	1.19	-2.85
25 yr 72 hr	N-CH-F07	4.05	1.27	-2.78
25 yr 72 hr	N-CH-F08	4.05	1.31	-2.74
25 yr 72 hr	N-CH-G07	4.03	1.19	-2.84
25 yr 72 hr	N-CH-G08	4.03	1.27	-2.76
25 yr 72 hr	N-CH-G09	4.02	1.29	-2.73
25 yr 72 hr	N-CH-G10	4.02	1.42	-2.6
25 yr 72 hr	N-CH-G11	4.03	1.44	-2.59
25 yr 72 hr	N-CH-I04	3.99	1.19	-2.8
25 yr 72 hr	N-CH-I05x1	4.02	1.2	-2.82
25 yr 72 hr	N-CH-I05x2	4.01	1.35	-2.66
25 yr 72 hr	N-CH-I05x3	4.01	1.43	-2.58
25 yr 72 hr	N-CH-I05x4	4.02	1.2	-2.82
25 yr 72 hr	N-CI	1.59	4.4	2.81
25 yr 72 hr	N-D10	4.03	1.54	-2.49
25 yr 72 hr	N-D16	2.55	3.67	1.12
25 yr 72 hr	N-D19	4.89	4.7	-0.19
25 yr 72 hr	N-D20	4.89	4.5	-0.39
25 yr 72 hr	N-D22	4.86	4.76	-0.1
25 yr 72 hr	N-D30	4.87	4.25	-0.62
25 yr 72 hr	N-DA	1.59	4.4	2.81
25 yr 72 hr	N-DA-A01	3.76	-0.47	-4.23

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Area BCDE Long Range Alternatives Selected Alternative (2BC,3D,1E)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DB	1.59	4.4	2.81
25 yr 72 hr	N-DC	1.59	4.4	2.81
25 yr 72 hr	N-DI-A01	3.98	-1.12	-5.1
25 yr 72 hr	N-DI-A02	4.02	-0.38	-4.4
25 yr 72 hr	N-DI-B04	4.51	1.1	-3.41
25 yr 72 hr	N-DI-B05	4.32	1.25	-3.07
25 yr 72 hr	N-DI-B05x	4.83	1.1	-3.73
25 yr 72 hr	N-DI-B06	4.33	1.4	-2.93
25 yr 72 hr	N-DI-B07	4.83	1.55	-3.28
25 yr 72 hr	N-DI-B08	4.83	1.87	-2.96
25 yr 72 hr	N-DI-B09	4.85	2.22	-2.63
25 yr 72 hr	N-DI-B10	4.87	2.99	-1.88
25 yr 72 hr	N-DI-B10x	4.85	2.23	-2.62
25 yr 72 hr	N-DI-B11	4.86	2.99	-1.87
25 yr 72 hr	N-DI-C03	4.09	0.22	-3.87
25 yr 72 hr	N-DI-C04	4.86	4.72	-0.14
25 yr 72 hr	N-DI-C05	4.76	3.59	-1.17
25 yr 72 hr	N-DP	4.39	1.36	-3.03
25 yr 72 hr	N-DP-A01	4.54	1.84	-2.7
25 yr 72 hr	N-DP-A02	4.59	2.22	-2.37
25 yr 72 hr	N-DP-A04	4.62	3.54	-1.08
25 yr 72 hr	N-DP-A07	4.89	3.61	-1.28
25 yr 72 hr	N-DP-A08	4.89	3.6	-1.29
25 yr 72 hr	N-DP-A09	4.88	3.26	-1.62
25 yr 72 hr	N-DP-A09x	4.89	3.64	-1.25
25 yr 72 hr	N-DP-A10	4.88	3.35	-1.53
25 yr 72 hr	N-DP-A11x	4.88	3.36	-1.52
25 yr 72 hr	N-DP-B2	4.57	2.07	-2.5
25 yr 72 hr	N-DP-C02	4.59	2.53	-2.06
25 yr 72 hr	N-DP-C03	3.76	1.07	-2.69
25 yr 72 hr	N-DP-C03x	4.59	2.55	-2.04
25 yr 72 hr	N-DP-D02	4.64	3.26	-1.38
25 yr 72 hr	N-DP-D03x	4.87	4.8	-0.07
25 yr 72 hr	N-DP-D04	4.85	3.81	-1.04
25 yr 72 hr	N-DP-D05x	4.88	4.11	-0.77
25 yr 72 hr	N-DP-D06x	4.94	4.35	-0.59
25 yr 72 hr	N-DP-D07x	5.03	4.47	-0.56
25 yr 72 hr	N-DP-D08x	5.1	4.54	-0.56
25 yr 72 hr	N-DP-D09	5.19	4.69	-0.5
25 yr 72 hr	N-DP-D10	5.55	5.51	-0.04
25 yr 72 hr	N-DP-E05	4.89	4.18	-0.71
25 yr 72 hr	N-DP-E06	4.92	4.9	-0.02
25 yr 72 hr	N-DP-E08	4.89	4.69	-0.2
25 yr 72 hr	N-DP-F07	5.89	5.72	-0.17

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Area BCDE Long Range Alternatives Selected Alternative (2BC,3D,1E)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DP-F08	5.13	4.68	-0.45
25 yr 72 hr	N-DP-F09	5.37	5.11	-0.26
25 yr 72 hr	N-DP-G05	4.58	3.66	-0.92
25 yr 72 hr	N-DP-G06	4.58	0.88	-3.7
25 yr 72 hr	N-DP-G07	4.58	1.94	-2.64
25 yr 72 hr	N-DP-G07x	4.57	0.89	-3.68
25 yr 72 hr	N-DP-G08	4.62	3.21	-1.41
25 yr 72 hr	N-DP-G08x	4.58	1.95	-2.63
25 yr 72 hr	N-DP-H04	4.58	2.22	-2.36
25 yr 72 hr	N-DP-H05	4.58	2.22	-2.36
25 yr 72 hr	N-DP-H05x	4.58	3.8	-0.78
25 yr 72 hr	N-DP-H06	4.57	0.57	-4
25 yr 72 hr	N-DP-H06x	4.58	4.06	-0.52
25 yr 72 hr	N-DP-K07	4.58	0.59	-3.99
25 yr 72 hr	N-DP-M10	5.26	4.78	-0.48
25 yr 72 hr	N-DP-M11	5.31	4.56	-0.75
25 yr 72 hr	N-DP-M12	5.38	5.28	-0.1
25 yr 72 hr	N-DP-N10	5.12	4.58	-0.54
25 yr 72 hr	N-DP-O10	4.88	3.34	-1.54
25 yr 72 hr	N-DP-O11	4.89	3.49	-1.4
25 yr 72 hr	N-DP-P06	4.64	4.54	-0.1
25 yr 72 hr	N-DP-Y03	5.12	5.12	0
25 yr 72 hr	N-DP-Z12	4.4	4.13	-0.27
25 yr 72 hr	N-DQ-A01	4.55	-0.34	-4.89
25 yr 72 hr	N-DQ-A01x	#N/A	0.04	#N/A
25 yr 72 hr	N-DQ-A02	4.56	3.13	-1.43
25 yr 72 hr	N-DQ-A03	4.55	-0.7	-5.25
25 yr 72 hr	N-DQ-A03x	3.13	-1.93	-5.06
25 yr 72 hr	N-DQ-A04	5.57	5.57	0
25 yr 72 hr	N-DQ-A05	4.36	-1.47	-5.83
25 yr 72 hr	N-DQ-A06	4.55	3.38	-1.17
25 yr 72 hr	N-DQ-A07	4.55	3.43	-1.12
25 yr 72 hr	N-DQ-A08	4.55	3.47	-1.08
25 yr 72 hr	N-E01	2.93	4.4	1.47
25 yr 72 hr	N-E02	3.39	4.4	1.01
25 yr 72 hr	N-E03	4.02	4.4	0.38
25 yr 72 hr	N-E07	4.54	4.54	0
25 yr 72 hr	N-E08	3.82	4.4	0.58
25 yr 72 hr	N-E10	3.74	4.4	0.66
25 yr 72 hr	N-E11	2.57	2.78	0.21
25 yr 72 hr	N-EA	1.59	4.4	2.81
25 yr 72 hr	N-EA-A01	3.86	2.15	-1.71
25 yr 72 hr	N-EA-A02	3.86	2.21	-1.65
25 yr 72 hr	N-EB	1.59	4.4	2.81

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Area BCDE Long Range Alternatives Selected Alternative (2BC,3D,1E)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-EB-A01	3.03	3.16	0.13
25 yr 72 hr	N-EC	1.59	4.4	2.81
25 yr 72 hr	N-EC-A01	3.11	3.25	0.14
25 yr 72 hr	N-ED	1.59	4.4	2.81
25 yr 72 hr	N-ED-A01	3.63	2.16	-1.47
25 yr 72 hr	N-ED-A02	3.64	2.14	-1.5
25 yr 72 hr	N-ED-A03	3.64	2.42	-1.22
25 yr 72 hr	N-EE	1.59	4.4	2.81
25 yr 72 hr	N-EE-A01	3.71	2.08	-1.63
25 yr 72 hr	N-EF	1.59	4.4	2.81
25 yr 72 hr	N-EF-A01	3.71	3.22	-0.49
25 yr 72 hr	N-EG	1.59	4.4	2.81
25 yr 72 hr	N-EG-A01	3.46	2.18	-1.28
25 yr 72 hr	N-EG-A02	3.66	1.99	-1.67
25 yr 72 hr	N-EH	1.59	4.4	2.81
25 yr 72 hr	N-EH-A01	2.02	1.43	-0.59
25 yr 72 hr	N-EI	1.59	4.4	2.81
25 yr 72 hr	N-EJ	1.59	4.4	2.81
25 yr 72 hr	N-EJ-A01	1.65	4.4	2.75
25 yr 72 hr	N-EK	1.59	4.4	2.81
25 yr 72 hr	N-EK-A01	3.76	4.4	0.64
25 yr 72 hr	N-EL	1.59	4.4	2.81
25 yr 72 hr	N-EL-A01	3.04	3.02	-0.02
25 yr 72 hr	N-EM	1.59	4.4	2.81
25 yr 72 hr	N-EM-A01	2.83	2.96	0.13
25 yr 72 hr	N-EM-A02	2.74	2.95	0.21
25 yr 72 hr	N-EM-A03	2.57	2.79	0.22
25 yr 72 hr	N-EN	1.59	4.4	2.81
25 yr 72 hr	N-EN-A01	2.92	2.73	-0.19
25 yr 72 hr	N-EO	1.59	4.4	2.81
25 yr 72 hr	N-EO-A01	2.46	2.77	0.31
25 yr 72 hr	N-EP	1.59	4.4	2.81
25 yr 72 hr	N-EP-A01	2.56	2.78	0.22
25 yr 72 hr	N-EQ	1.59	4.4	2.81
25 yr 72 hr	N-EQ-A01	1.67	4.46	2.79
25 yr 72 hr	N-ER	1.59	4.4	2.81
25 yr 72 hr	N-ES	1.59	4.4	2.81
25 yr 72 hr	N-ET	1.59	4.4	2.81
25 yr 72 hr	N-ET-A01	1.6	3.41	1.81
25 yr 72 hr	N-P-B-A01-DSJ	#N/A	1.46	#N/A
25 yr 72 hr	N-P-BE-A02-DSJ	#N/A	2.55	#N/A
25 yr 72 hr	N-Pump-C3	#N/A	1.68	#N/A
25 yr 72 hr	NAltAdd_01	#N/A	1.73	#N/A
25 yr 72 hr	P-CG-A01-DSJ	#N/A	1.91	#N/A

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Area BCDE Long Range Alternatives Selected Alternative (2BC,3D,1E)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	P-DA-A01-DSJ	#N/A	-2.08	#N/A
25 yr 72 hr	P-DI-A01-DSJ	#N/A	-2.01	#N/A
25 yr 72 hr	P-DQ-A01 DSJ	#N/A	-4.4	#N/A
25 yr 72 hr	P-EA-A01-DSJ	#N/A	2.07	#N/A
25 yr 72 hr	P-EL-A01-DSJ	#N/A	1.5	#N/A
25 yr 72 hr	P-EM-A01-DSJ	#N/A	2.96	#N/A
25 yr 72 hr	P-EN-A01-DSJ	#N/A	1.8	#N/A
25 yr 72 hr	P-EO-A01-DSJ	#N/A	2	#N/A
25 yr 72 hr	P-EP-A01-DSJ	#N/A	2.01	#N/A
25 yr 72 hr	Trunkline-Junction-1	#N/A	2.78	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	9thSt-Node	#N/A	-2.67	#N/A
10 yr 1 hr	AltAdd-04-DSJ	#N/A	2.3	#N/A
10 yr 1 hr	N-BA	1.59	4.4	2.81
10 yr 1 hr	N-BA-A01	3.33	2.33	-1
10 yr 1 hr	N-BA-A02	3.37	2.41	-0.96
10 yr 1 hr	N-BA-A03	3.4	2.51	-0.89
10 yr 1 hr	N-BA-A03x	3.37	2.41	-0.96
10 yr 1 hr	N-BA-A04	3.46	2.58	-0.88
10 yr 1 hr	N-BA-A04x	3.4	2.61	-0.79
10 yr 1 hr	N-BA-A05	3.46	2.6	-0.86
10 yr 1 hr	N-BA-A06	3.58	2.68	-0.9
10 yr 1 hr	N-BA-A07	3.65	2.76	-0.89
10 yr 1 hr	N-BA-A07x	3.61	2.68	-0.93
10 yr 1 hr	N-BA-A08	3.76	2.77	-0.99
10 yr 1 hr	N-BA-A08x	3.65	3.06	-0.59
10 yr 1 hr	N-BA-A09	3.91	4.13	0.22
10 yr 1 hr	N-BA-B02	3.26	2.32	-0.94
10 yr 1 hr	N-BA-B03	3.26	2.14	-1.12
10 yr 1 hr	N-BA-B04	3.25	2.08	-1.17
10 yr 1 hr	N-BA-C03	3.33	2.4	-0.93
10 yr 1 hr	N-BA-C04	3.32	2.4	-0.92
10 yr 1 hr	N-BA-D05	3.48	2.63	-0.85
10 yr 1 hr	N-BA-D06	3.49	2.81	-0.68
10 yr 1 hr	N-BA-D07	3.65	3.21	-0.44
10 yr 1 hr	N-BA-D08	3.72	3.21	-0.51
10 yr 1 hr	N-BA-E09	3.76	2.81	-0.95
10 yr 1 hr	N-BA-F09	3.87	2.77	-1.1
10 yr 1 hr	N-BA-K04	3.39	3.04	-0.35
10 yr 1 hr	N-BA-K05	3.41	3.14	-0.27
10 yr 1 hr	N-BA-K06	3.6	3.43	-0.17
10 yr 1 hr	N-BA-K08	5.06	5.05	-0.01
10 yr 1 hr	N-BA-L06	3.54	3.11	-0.43
10 yr 1 hr	N-BA-Q05	3.38	-1.71	-5.09
10 yr 1 hr	N-BA-Q06	3.38	-1.71	-5.09
10 yr 1 hr	N-BA-Q06x	3.38	-1.74	-5.12
10 yr 1 hr	N-BA-Q07	3.38	-0.47	-3.85
10 yr 1 hr	N-BA-Q07x	3.37	-1.49	-4.86
10 yr 1 hr	N-BA-Q08	3.39	-0.3	-3.69
10 yr 1 hr	N-BA-R06	3.39	-1.67	-5.06
10 yr 1 hr	N-BA-R07	3.38	-1.68	-5.06
10 yr 1 hr	N-BA-R07x	3.4	-1.29	-4.69
10 yr 1 hr	N-BA-R08	3.38	-1.68	-5.06
10 yr 1 hr	N-BA-R08x	3.39	-1.67	-5.06
10 yr 1 hr	N-BA-R09	3.38	-1.69	-5.07

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Area BCDE Long Range Alternatives Unselected Alternative (3BC,2DE)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA-R10	3.38	-1.88	-5.26
10 yr 1 hr	N-BA-R11	3.37	-2.33	-5.7
10 yr 1 hr	N-BA-S06a	3.68	3.15	-0.53
10 yr 1 hr	N-BA-T07	3.69	2.51	-1.18
10 yr 1 hr	N-BA-T08	3.68	2.5	-1.18
10 yr 1 hr	N-BA-T08x	3.69	2.52	-1.17
10 yr 1 hr	N-BA-T09	3.4	2.49	-0.91
10 yr 1 hr	N-BA-T09x	3.68	2.51	-1.17
10 yr 1 hr	N-BA-T10	3.4	2.49	-0.91
10 yr 1 hr	N-BA-U02	3.32	2.41	-0.91
10 yr 1 hr	N-BA-U03	3.33	2.55	-0.78
10 yr 1 hr	N-BA-V07	3.75	3.73	-0.02
10 yr 1 hr	N-BA-W08	4.19	3.56	-0.63
10 yr 1 hr	N-BA-W09A	4.2	3.51	-0.69
10 yr 1 hr	N-BA-W09B	4.17	3.4	-0.77
10 yr 1 hr	N-BB	1.59	4.4	2.81
10 yr 1 hr	N-BB-A01	3.32	-2.43	-5.75
10 yr 1 hr	N-BB-A02	3.33	-2.34	-5.67
10 yr 1 hr	N-BB-A03	3.31	-0.47	-3.78
10 yr 1 hr	N-BB-A04	3.32	-0.46	-3.78
10 yr 1 hr	N-BC	1.59	4.4	2.81
10 yr 1 hr	N-BC-A01	2.39	2.55	0.16
10 yr 1 hr	N-BC-A02	4.78	3.04	-1.74
10 yr 1 hr	N-BD	1.59	4.4	2.81
10 yr 1 hr	N-BD-A01	3.33	-3.2	-6.53
10 yr 1 hr	N-BD-A02	3.36	-2.56	-5.92
10 yr 1 hr	N-BD-A02x	3.37	-2.54	-5.91
10 yr 1 hr	N-BD-A03	3.37	-1.81	-5.18
10 yr 1 hr	N-BD-A05	3.37	-1.92	-5.29
10 yr 1 hr	N-BD-B02	3.33	-3.19	-6.52
10 yr 1 hr	N-BD-B03	3.32	-1.36	-4.68
10 yr 1 hr	N-BD-B04	3.32	2.41	-0.91
10 yr 1 hr	N-BD-B04x	3.32	-2.64	-5.96
10 yr 1 hr	N-BE	1.59	4.4	2.81
10 yr 1 hr	N-BE-A01	3.31	2.38	-0.93
10 yr 1 hr	N-BE-A03	3.39	2.49	-0.9
10 yr 1 hr	N-BE-A04	3.4	2.52	-0.88
10 yr 1 hr	N-BF	1.59	4.4	2.81
10 yr 1 hr	N-BF-A01	3.9	3.92	0.02
10 yr 1 hr	N-CA	1.59	4.4	2.81
10 yr 1 hr	N-CA-A01c	5.81	4.47	-1.34
10 yr 1 hr	N-CA-A01d	3.23	2.94	-0.29
10 yr 1 hr	N-CA-A02	3.35	3.07	-0.28
10 yr 1 hr	N-CA-A03	3.37	3.12	-0.25

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-A04	3.4	3.24	-0.16
10 yr 1 hr	N-CA-A05	3.41	3.32	-0.09
10 yr 1 hr	N-CA-A07	4.72	4.89	0.17
10 yr 1 hr	N-CA-B03	3.36	3.09	-0.27
10 yr 1 hr	N-CA-B04	3.38	3.13	-0.25
10 yr 1 hr	N-CA-B07	4.35	4.36	0.01
10 yr 1 hr	N-CA-C03	3.13	-0.91	-4.04
10 yr 1 hr	N-CA-C04	3.11	-0.91	-4.02
10 yr 1 hr	N-CA-C05	3.14	2.79	-0.35
10 yr 1 hr	N-CA-D06	3.62	3.63	0.01
10 yr 1 hr	N-CA-D07	3.62	3.64	0.02
10 yr 1 hr	N-CA-D07x	3.79	3.8	0.01
10 yr 1 hr	N-CA-D08	3.13	1.89	-1.24
10 yr 1 hr	N-CA-D08x	3.64	3.65	0.01
10 yr 1 hr	N-CA-D09x	3.13	2.56	-0.57
10 yr 1 hr	N-CA-E07	4.42	4.41	-0.01
10 yr 1 hr	N-CA-E08	4.43	4.41	-0.02
10 yr 1 hr	N-CA-E09x	4.57	4.41	-0.16
10 yr 1 hr	N-CA-F04	3.37	-0.89	-4.26
10 yr 1 hr	N-CA-F05	3.09	-0.87	-3.96
10 yr 1 hr	N-CA-F05x	3.19	-0.9	-4.09
10 yr 1 hr	N-CA-F06	3.08	-0.89	-3.97
10 yr 1 hr	N-CA-F06x	3.07	-0.85	-3.92
10 yr 1 hr	N-CA-F07	3.08	-0.88	-3.96
10 yr 1 hr	N-CA-F07x	3.07	-0.87	-3.94
10 yr 1 hr	N-CA-F08	3.09	-0.62	-3.71
10 yr 1 hr	N-CA-F09	3.09	-0.68	-3.77
10 yr 1 hr	N-CA-F09x	3.09	-0.61	-3.7
10 yr 1 hr	N-CA-F10	3.1	-0.82	-3.92
10 yr 1 hr	N-CA-F11	3.1	-0.89	-3.99
10 yr 1 hr	N-CA-F11x	3.09	-0.5	-3.59
10 yr 1 hr	N-CA-F12	3.1	-2.3	-5.4
10 yr 1 hr	N-CA-F12x	3.1	0.99	-2.11
10 yr 1 hr	N-CA-G08	3.1	-0.14	-3.24
10 yr 1 hr	N-CA-G09	3.1	1.26	-1.84
10 yr 1 hr	N-CA-G10	3.39	2.81	-0.58
10 yr 1 hr	N-CA-G11x	3.37	2.83	-0.54
10 yr 1 hr	N-CA-H09	3.1	-0.55	-3.65
10 yr 1 hr	N-CA-H10	3.1	-0.54	-3.64
10 yr 1 hr	N-CA-H10x	3.1	-0.54	-3.64
10 yr 1 hr	N-CA-H11	3.12	-0.42	-3.54
10 yr 1 hr	N-CA-H11x	3.1	-0.57	-3.67
10 yr 1 hr	N-CA-H12	3.12	-0.38	-3.5
10 yr 1 hr	N-CA-H13	3.24	1.18	-2.06

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-H14	3.32	1.27	-2.05
10 yr 1 hr	N-CA-I12	3.12	-0.43	-3.55
10 yr 1 hr	N-CA-I13	3.12	-0.45	-3.57
10 yr 1 hr	N-CA-I14	3.12	-0.48	-3.6
10 yr 1 hr	N-CA-J14	3.26	2.18	-1.08
10 yr 1 hr	N-CA-J15x	3.3	2.23	-1.07
10 yr 1 hr	N-CA-K03	3.36	3.04	-0.32
10 yr 1 hr	N-CA-L04	3.38	3.09	-0.29
10 yr 1 hr	N-CA-L05	3.52	3.1	-0.42
10 yr 1 hr	N-CA-M06	3.55	3.15	-0.4
10 yr 1 hr	N-CA-N05	3.57	3.54	-0.03
10 yr 1 hr	N-CA-O08	4.93	4.89	-0.04
10 yr 1 hr	N-CA-S05	3.23	0.01	-3.22
10 yr 1 hr	N-CA-T08	3.06	-0.9	-3.96
10 yr 1 hr	N-CA-T09	3.06	-0.9	-3.96
10 yr 1 hr	N-CB	1.59	4.4	2.81
10 yr 1 hr	N-CB-A01	3	-0.93	-3.93
10 yr 1 hr	N-CB-Added	#N/A	-0.93	#N/A
10 yr 1 hr	N-CC	1.59	4.4	2.81
10 yr 1 hr	N-CC-A01	2.81	-0.93	-3.74
10 yr 1 hr	N-CC-A02	2.84	0.96	-1.88
10 yr 1 hr	N-CC-A03	3.06	1.09	-1.97
10 yr 1 hr	N-CE	1.59	4.4	2.81
10 yr 1 hr	N-CE-A01	3.1	-2.71	-5.81
10 yr 1 hr	N-CE-A02	3.1	-0.65	-3.75
10 yr 1 hr	N-CE-A03	3.1	0.38	-2.72
10 yr 1 hr	N-CF	1.59	4.4	2.81
10 yr 1 hr	N-CF-A01	3.12	-2.71	-5.83
10 yr 1 hr	N-CF-A02	3.12	-0.66	-3.78
10 yr 1 hr	N-CF-A03x	3.12	-0.66	-3.78
10 yr 1 hr	N-CG	1.59	4.4	2.81
10 yr 1 hr	N-CG-A01	3.12	2.65	-0.47
10 yr 1 hr	N-CG-A02x	3.12	2.84	-0.28
10 yr 1 hr	N-CG-A03x	3.26	3	-0.26
10 yr 1 hr	N-CH	1.59	4.4	2.81
10 yr 1 hr	N-CH-A01b	1.81	2.5	0.69
10 yr 1 hr	N-CH-A02	2.23	2.53	0.3
10 yr 1 hr	N-CH-A03	3.64	2.59	-1.05
10 yr 1 hr	N-CH-A04	3.76	2.56	-1.2
10 yr 1 hr	N-CH-Added	#N/A	2.49	#N/A
10 yr 1 hr	N-CH-B02	2.87	2.61	-0.26
10 yr 1 hr	N-CH-B03	3.84	2.78	-1.06
10 yr 1 hr	N-CH-B03x	2.89	2.62	-0.27
10 yr 1 hr	N-CH-B04	3.91	3.81	-0.1

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CH-B04x	4.04	2.88	-1.16
10 yr 1 hr	N-CH-B05	4.72	4.48	-0.24
10 yr 1 hr	N-CH-B05x	3.99	3.85	-0.14
10 yr 1 hr	N-CH-B06	4.88	4.86	-0.02
10 yr 1 hr	N-CH-B06x	4.82	4.78	-0.04
10 yr 1 hr	N-CH-B07	5.89	5.88	-0.01
10 yr 1 hr	N-CH-C04	3.75	2.68	-1.07
10 yr 1 hr	N-CH-C05	3.77	2.87	-0.9
10 yr 1 hr	N-CH-C05x1	3.77	2.69	-1.08
10 yr 1 hr	N-CH-C05x2	3.77	2.68	-1.09
10 yr 1 hr	N-CH-C05x3	3.77	2.68	-1.09
10 yr 1 hr	N-CH-C06	3.78	2.89	-0.89
10 yr 1 hr	N-CH-C06x	3.77	2.87	-0.9
10 yr 1 hr	N-CH-C07x	3.77	2.9	-0.87
10 yr 1 hr	N-CH-D05	3.77	2.7	-1.07
10 yr 1 hr	N-CH-D06	3.77	2.74	-1.03
10 yr 1 hr	N-CH-D08x	3.77	2.75	-1.02
10 yr 1 hr	N-CH-E06	3.78	2.88	-0.9
10 yr 1 hr	N-CH-E07	3.78	2.89	-0.89
10 yr 1 hr	N-CH-F07	3.78	2.89	-0.89
10 yr 1 hr	N-CH-F08	3.78	2.89	-0.89
10 yr 1 hr	N-CH-G07	3.77	2.74	-1.03
10 yr 1 hr	N-CH-G08	3.77	2.75	-1.02
10 yr 1 hr	N-CH-G09	3.77	2.74	-1.03
10 yr 1 hr	N-CH-G10	3.77	2.76	-1.01
10 yr 1 hr	N-CH-G11	3.77	2.75	-1.02
10 yr 1 hr	N-CH-I04	3.73	2.7	-1.03
10 yr 1 hr	N-CH-I05x1	3.76	2.71	-1.05
10 yr 1 hr	N-CH-I05x2	3.76	2.74	-1.02
10 yr 1 hr	N-CH-I05x3	3.76	2.8	-0.96
10 yr 1 hr	N-CH-I05x4	3.76	2.71	-1.05
10 yr 1 hr	N-CI	1.59	4.4	2.81
10 yr 1 hr	N-D10	3.77	2.75	-1.02
10 yr 1 hr	N-D16	2.53	3.64	1.11
10 yr 1 hr	N-D19	4.78	4.67	-0.11
10 yr 1 hr	N-D20	4.77	4.44	-0.33
10 yr 1 hr	N-D22	4.79	4.75	-0.04
10 yr 1 hr	N-D30	4.76	4.23	-0.53
10 yr 1 hr	N-DA	1.59	4.4	2.81
10 yr 1 hr	N-DA-A01	3.36	0.03	-3.33
10 yr 1 hr	N-DB	1.59	4.4	2.81
10 yr 1 hr	N-DC	1.59	4.4	2.81
10 yr 1 hr	N-DI-A01	3.51	-0.82	-4.33
10 yr 1 hr	N-DI-A02	3.52	0.03	-3.49

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Area BCDE Long Range Alternatives Unselected Alternative (3BC,2DE)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DI-B04	4.27	0.85	-3.42
10 yr 1 hr	N-DI-B05	4.03	0.97	-3.06
10 yr 1 hr	N-DI-B05x	4.71	0.85	-3.86
10 yr 1 hr	N-DI-B06	4.04	1.09	-2.95
10 yr 1 hr	N-DI-B07	4.72	1.21	-3.51
10 yr 1 hr	N-DI-B08	4.72	1.47	-3.25
10 yr 1 hr	N-DI-B09	4.73	1.78	-2.95
10 yr 1 hr	N-DI-B10	4.75	2.61	-2.14
10 yr 1 hr	N-DI-B10x	4.73	1.83	-2.9
10 yr 1 hr	N-DI-B11	4.74	2.62	-2.12
10 yr 1 hr	N-DI-C03	3.55	0.3	-3.25
10 yr 1 hr	N-DI-C04	4.78	2.81	-1.97
10 yr 1 hr	N-DI-C05	4.52	-0.48	-5
10 yr 1 hr	N-DP	4.17	-3.6	-7.77
10 yr 1 hr	N-DP-A01	4.32	-2.82	-7.14
10 yr 1 hr	N-DP-A02	4.36	-2.32	-6.68
10 yr 1 hr	N-DP-A04	4.39	-0.32	-4.71
10 yr 1 hr	N-DP-A07	4.77	3.04	-1.73
10 yr 1 hr	N-DP-A08	4.77	3.04	-1.73
10 yr 1 hr	N-DP-A09	4.77	2.81	-1.96
10 yr 1 hr	N-DP-A09x	4.77	3.05	-1.72
10 yr 1 hr	N-DP-A10	4.76	2.86	-1.9
10 yr 1 hr	N-DP-A11x	4.76	2.87	-1.89
10 yr 1 hr	N-DP-B2	4.35	-2.51	-6.86
10 yr 1 hr	N-DP-C02	4.37	-1.48	-5.85
10 yr 1 hr	N-DP-C03	3.36	1.06	-2.3
10 yr 1 hr	N-DP-C03x	4.37	0.87	-3.5
10 yr 1 hr	N-DP-D02	4.43	-0.77	-5.2
10 yr 1 hr	N-DP-D03x	4.82	4.63	-0.19
10 yr 1 hr	N-DP-D04	4.59	-0.3	-4.89
10 yr 1 hr	N-DP-D05x	4.64	-0.09	-4.73
10 yr 1 hr	N-DP-D06x	4.71	0.11	-4.6
10 yr 1 hr	N-DP-D07x	4.81	0.37	-4.44
10 yr 1 hr	N-DP-D08x	4.89	0.57	-4.32
10 yr 1 hr	N-DP-D09	5.01	1.44	-3.57
10 yr 1 hr	N-DP-D10	5.4	5.32	-0.08
10 yr 1 hr	N-DP-E05	4.74	4.11	-0.63
10 yr 1 hr	N-DP-E06	4.86	4.85	-0.01
10 yr 1 hr	N-DP-E08	4.78	4.65	-0.13
10 yr 1 hr	N-DP-F07	5.1	5.01	-0.09
10 yr 1 hr	N-DP-F08	4.94	4.62	-0.32
10 yr 1 hr	N-DP-F09	4.96	4.95	-0.01
10 yr 1 hr	N-DP-G05	4.36	0.05	-4.31
10 yr 1 hr	N-DP-G06	4.36	0.41	-3.95

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DP-G07	4.36	0.57	-3.79
10 yr 1 hr	N-DP-G07x	4.35	0.41	-3.94
10 yr 1 hr	N-DP-G08	4.39	0.66	-3.73
10 yr 1 hr	N-DP-G08x	4.36	0.55	-3.81
10 yr 1 hr	N-DP-H04	4.36	-0.76	-5.12
10 yr 1 hr	N-DP-H05	4.36	0.1	-4.26
10 yr 1 hr	N-DP-H05x	4.36	3.79	-0.57
10 yr 1 hr	N-DP-H06	4.35	0.31	-4.04
10 yr 1 hr	N-DP-H06x	4.36	4.05	-0.31
10 yr 1 hr	N-DP-K07	4.36	0.31	-4.05
10 yr 1 hr	N-DP-M10	5.11	1.38	-3.73
10 yr 1 hr	N-DP-M11	5.2	0.79	-4.41
10 yr 1 hr	N-DP-M12	5.25	5.12	-0.13
10 yr 1 hr	N-DP-N10	4.89	0.01	-4.88
10 yr 1 hr	N-DP-O10	4.77	2.98	-1.79
10 yr 1 hr	N-DP-O11	4.88	3.18	-1.7
10 yr 1 hr	N-DP-P06	4.6	2.6	-2
10 yr 1 hr	N-DP-Y03	5.11	5.11	0
10 yr 1 hr	N-DP-Z12	4.26	4.09	-0.17
10 yr 1 hr	N-DQ-A01	4.33	-0.14	-4.47
10 yr 1 hr	N-DQ-A01x	#N/A	0.26	#N/A
10 yr 1 hr	N-DQ-A02	4.34	3.11	-1.23
10 yr 1 hr	N-DQ-A03	4.33	-0.51	-4.84
10 yr 1 hr	N-DQ-A03x	2.94	-4.19	-7.13
10 yr 1 hr	N-DQ-A04	5.32	5.6	0.28
10 yr 1 hr	N-DQ-A05	4.03	-2.57	-6.6
10 yr 1 hr	N-DQ-A06	4.33	3.36	-0.97
10 yr 1 hr	N-DQ-A07	4.33	3.4	-0.93
10 yr 1 hr	N-DQ-A08	4.33	3.45	-0.88
10 yr 1 hr	N-E01	2.9	4.4	1.5
10 yr 1 hr	N-E03	4	4.4	0.4
10 yr 1 hr	N-E07	4.49	4.53	0.04
10 yr 1 hr	N-E08	3.78	4.4	0.62
10 yr 1 hr	N-E10	3.71	4.4	0.69
10 yr 1 hr	N-E11	1.83	1.83	0
10 yr 1 hr	N-EA	1.59	4.4	2.81
10 yr 1 hr	N-EA-A01	3.81	3.76	-0.05
10 yr 1 hr	N-EA-A02	3.81	3.76	-0.05
10 yr 1 hr	N-EB	1.59	4.4	2.81
10 yr 1 hr	N-EB-A01	2.52	3.74	1.22
10 yr 1 hr	N-EC	1.59	4.4	2.81
10 yr 1 hr	N-EC-A01	2.69	3.74	1.05
10 yr 1 hr	N-ED	1.59	4.4	2.81
10 yr 1 hr	N-ED-A01	3.24	3.3	0.06

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-ED-A02	3.41	3.48	0.07
10 yr 1 hr	N-ED-A03	3.51	3.59	0.08
10 yr 1 hr	N-EE	1.59	4.4	2.81
10 yr 1 hr	N-EE-A01	3.66	3.8	0.14
10 yr 1 hr	N-EF	1.59	4.4	2.81
10 yr 1 hr	N-EF-A01	3.11	3.8	0.69
10 yr 1 hr	N-EG	1.59	4.4	2.81
10 yr 1 hr	N-EG-A01	3.43	3.49	0.06
10 yr 1 hr	N-EG-A02	3.62	3.48	-0.14
10 yr 1 hr	N-EH	1.59	4.4	2.81
10 yr 1 hr	N-EH-A01	1.77	2.89	1.12
10 yr 1 hr	N-EI	1.59	4.4	2.81
10 yr 1 hr	N-EJ	1.59	4.4	2.81
10 yr 1 hr	N-EJ-A01	1.61	4.4	2.79
10 yr 1 hr	N-EK	1.59	4.4	2.81
10 yr 1 hr	N-EK-A01	3.68	4.4	0.72
10 yr 1 hr	N-EL	1.59	4.4	2.81
10 yr 1 hr	N-EL-A01	3.01	2.99	-0.02
10 yr 1 hr	N-EM	1.59	4.4	2.81
10 yr 1 hr	N-EM-A01	2.63	2.88	0.25
10 yr 1 hr	N-EM-A02	2.61	2.86	0.25
10 yr 1 hr	N-EM-A03	2	1.98	-0.02
10 yr 1 hr	N-EN	1.59	4.4	2.81
10 yr 1 hr	N-EN-A01	2.83	2.46	-0.37
10 yr 1 hr	N-EO	1.59	4.4	2.81
10 yr 1 hr	N-EO-A01	2.22	2.21	-0.01
10 yr 1 hr	N-EP	1.59	4.4	2.81
10 yr 1 hr	N-EP-A01	1.98	1.98	0
10 yr 1 hr	N-EQ	1.59	4.4	2.81
10 yr 1 hr	N-EQ-A01	1.65	4.44	2.79
10 yr 1 hr	N-ER	1.59	4.4	2.81
10 yr 1 hr	N-ES	1.59	4.4	2.81
10 yr 1 hr	N-ET	1.59	4.4	2.81
10 yr 1 hr	N-ET-A01	1.59	1.65	0.06
10 yr 1 hr	NAltAdd_01	#N/A	3.43	#N/A
10 yr 1 hr	NZA-0110	#N/A	2.56	#N/A
10 yr 1 hr	NZA-0120	#N/A	2.4	#N/A
10 yr 1 hr	NZA-0130	#N/A	1.83	#N/A
10 yr 1 hr	NZA-0150	#N/A	2.85	#N/A
10 yr 1 hr	NZA-0160	#N/A	2.04	#N/A
10 yr 1 hr	P-Added-7-DSJ	#N/A	-2.8	#N/A
10 yr 1 hr	P-Added-9-DSJ	#N/A	-3.2	#N/A
10 yr 1 hr	P-BA-A01-DSJ	#N/A	2.27	#N/A
10 yr 1 hr	P-BA-D08-Added-6-DS	#N/A	-2.5	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	P-BB-A01-DSJ	#N/A	-3.2	#N/A
10 yr 1 hr	P-BC-A01-DSJ	#N/A	1.5	#N/A
10 yr 1 hr	P-BD-A02-DSJ	#N/A	-3.2	#N/A
10 yr 1 hr	P-BE-A01-Added-1-DSJ	#N/A	2.28	#N/A
10 yr 1 hr	P-BE-A01-DSJ	#N/A	2.32	#N/A
10 yr 1 hr	P-CC-A01-DSJ	#N/A	-0.93	#N/A
10 yr 1 hr	P-CE-A01-DSJ	#N/A	-2.8	#N/A
10 yr 1 hr	P-CF-A01-DSJ	#N/A	-2.8	#N/A
10 yr 1 hr	P-CG-A01-DSJ	#N/A	2	#N/A
10 yr 1 hr	P-ED-A01-DSJ	#N/A	2.3	#N/A
10 yr 1 hr	P-EL-A01-DSJ	#N/A	1.5	#N/A
10 yr 1 hr	P-EM-A01-DSJ	#N/A	2.88	#N/A
10 yr 1 hr	P-EN-A01-DSJ	#N/A	1.8	#N/A
10 yr 1 hr	P-EO-A01-DSJ	#N/A	2	#N/A
10 yr 1 hr	P-EP-A01-DSJ	#N/A	1.98	#N/A
10 yr 1 hr	oposed-Trunkline-1-D	#N/A	2.71	#N/A
10 yr 1 hr	Pump D2 Node	#N/A	-2.08	#N/A
10 yr 1 hr	Trunkline-Junction-1	#N/A	3.01	#N/A

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Area BCDE Long Range Alternatives Unselected Alternative (3BC,2DE)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	9thSt-Node	#N/A	1.93	#N/A
25 yr 72 hr	AltAdd-04-DSJ	#N/A	2.3	#N/A
25 yr 72 hr	N-BA	1.59	4.4	2.81
25 yr 72 hr	N-BA-A01	3.55	3.11	-0.44
25 yr 72 hr	N-BA-A02	3.6	3.16	-0.44
25 yr 72 hr	N-BA-A03	3.64	3.22	-0.42
25 yr 72 hr	N-BA-A03x	3.6	3.16	-0.44
25 yr 72 hr	N-BA-A04	3.71	3.29	-0.42
25 yr 72 hr	N-BA-A04x	3.63	3.21	-0.42
25 yr 72 hr	N-BA-A05	3.72	3.3	-0.42
25 yr 72 hr	N-BA-A06	3.78	3.49	-0.29
25 yr 72 hr	N-BA-A07	3.82	3.6	-0.22
25 yr 72 hr	N-BA-A07x	3.81	3.54	-0.27
25 yr 72 hr	N-BA-A08	3.83	3.62	-0.21
25 yr 72 hr	N-BA-A08x	3.82	3.6	-0.22
25 yr 72 hr	N-BA-A09	4.01	4.29	0.28
25 yr 72 hr	N-BA-B02	3.41	3.09	-0.32
25 yr 72 hr	N-BA-B03	3.41	3.09	-0.32
25 yr 72 hr	N-BA-B04	3.39	3.08	-0.31
25 yr 72 hr	N-BA-C03	3.57	3.12	-0.45
25 yr 72 hr	N-BA-C04	3.57	3.09	-0.48
25 yr 72 hr	N-BA-D05	3.73	3.31	-0.42
25 yr 72 hr	N-BA-D06	3.75	3.34	-0.41
25 yr 72 hr	N-BA-D07	3.85	3.6	-0.25
25 yr 72 hr	N-BA-D08	3.89	3.61	-0.28
25 yr 72 hr	N-BA-E09	3.83	3.62	-0.21
25 yr 72 hr	N-BA-F09	3.88	3.62	-0.26
25 yr 72 hr	N-BA-K04	3.69	3.23	-0.46
25 yr 72 hr	N-BA-K05	3.72	3.44	-0.28
25 yr 72 hr	N-BA-K06	3.78	3.69	-0.09
25 yr 72 hr	N-BA-K08	5.08	5.08	0
25 yr 72 hr	N-BA-L06	3.76	3.54	-0.22
25 yr 72 hr	N-BA-Q05	3.67	2.56	-1.11
25 yr 72 hr	N-BA-Q06	3.66	2.56	-1.1
25 yr 72 hr	N-BA-Q06x	3.67	2.54	-1.13
25 yr 72 hr	N-BA-Q07	3.68	2.76	-0.92
25 yr 72 hr	N-BA-Q07x	3.66	2.55	-1.11
25 yr 72 hr	N-BA-Q08	3.68	2.91	-0.77
25 yr 72 hr	N-BA-R06	3.69	3.04	-0.65
25 yr 72 hr	N-BA-R07	3.68	2.82	-0.86
25 yr 72 hr	N-BA-R07x	3.7	3.13	-0.57
25 yr 72 hr	N-BA-R08	3.66	2.77	-0.89
25 yr 72 hr	N-BA-R08x	3.68	2.82	-0.86
25 yr 72 hr	N-BA-R09	3.67	2.77	-0.9

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA-R10	3.67	2.77	-0.9
25 yr 72 hr	N-BA-R11	3.65	2.75	-0.9
25 yr 72 hr	N-BA-S06a	3.94	3.56	-0.38
25 yr 72 hr	N-BA-T07	3.73	3.22	-0.51
25 yr 72 hr	N-BA-T08	3.72	3.18	-0.54
25 yr 72 hr	N-BA-T08x	3.73	3.22	-0.51
25 yr 72 hr	N-BA-T09	3.69	3.13	-0.56
25 yr 72 hr	N-BA-T09x	3.71	3.18	-0.53
25 yr 72 hr	N-BA-T10	3.69	3.13	-0.56
25 yr 72 hr	N-BA-U02	3.55	3.11	-0.44
25 yr 72 hr	N-BA-U03	3.56	3.12	-0.44
25 yr 72 hr	N-BA-V07	3.8	3.78	-0.02
25 yr 72 hr	N-BA-W08	4.54	4.49	-0.05
25 yr 72 hr	N-BA-W09A	4.55	4.5	-0.05
25 yr 72 hr	N-BA-W09B	4.51	4.46	-0.05
25 yr 72 hr	N-BB	1.59	4.4	2.81
25 yr 72 hr	N-BB-A01	3.6	2.64	-0.96
25 yr 72 hr	N-BB-A02	3.59	2.73	-0.86
25 yr 72 hr	N-BB-A03	3.57	2.73	-0.84
25 yr 72 hr	N-BB-A04	3.58	2.73	-0.85
25 yr 72 hr	N-BC	1.59	4.4	2.81
25 yr 72 hr	N-BC-A01	2.54	2.66	0.12
25 yr 72 hr	N-BC-A02	4.82	3.24	-1.58
25 yr 72 hr	N-BD	1.59	4.4	2.81
25 yr 72 hr	N-BD-A01	3.59	1.32	-2.27
25 yr 72 hr	N-BD-A02	3.64	2.13	-1.51
25 yr 72 hr	N-BD-A02x	3.65	2.19	-1.46
25 yr 72 hr	N-BD-A03	3.65	2.23	-1.42
25 yr 72 hr	N-BD-A05	3.64	2.4	-1.24
25 yr 72 hr	N-BD-B02	3.59	1.34	-2.25
25 yr 72 hr	N-BD-B03	3.57	1.61	-1.96
25 yr 72 hr	N-BD-B04	3.64	2.61	-1.03
25 yr 72 hr	N-BD-B04x	3.57	1.94	-1.63
25 yr 72 hr	N-BE	1.59	4.4	2.81
25 yr 72 hr	N-BE-A01	3.56	3.07	-0.49
25 yr 72 hr	N-BE-A03	3.68	3.12	-0.56
25 yr 72 hr	N-BE-A04	3.68	3.14	-0.54
25 yr 72 hr	N-BF	1.59	4.4	2.81
25 yr 72 hr	N-BF-A01	4.06	4.06	0
25 yr 72 hr	N-CA	1.59	4.4	2.81
25 yr 72 hr	N-CA-A01c	5.81	4.47	-1.34
25 yr 72 hr	N-CA-A01d	3.45	3.17	-0.28
25 yr 72 hr	N-CA-A02	3.58	3.29	-0.29
25 yr 72 hr	N-CA-A03	3.59	3.32	-0.27

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-A04	3.6	3.37	-0.23
25 yr 72 hr	N-CA-A05	3.6	3.41	-0.19
25 yr 72 hr	N-CA-A07	5.04	5.21	0.17
25 yr 72 hr	N-CA-B03	3.59	3.31	-0.28
25 yr 72 hr	N-CA-B04	3.6	3.34	-0.26
25 yr 72 hr	N-CA-B07	4.7	4.68	-0.02
25 yr 72 hr	N-CA-C03	3.38	0.17	-3.21
25 yr 72 hr	N-CA-C04	3.35	0.38	-2.97
25 yr 72 hr	N-CA-C05	3.39	2.88	-0.51
25 yr 72 hr	N-CA-D06	3.64	3.65	0.01
25 yr 72 hr	N-CA-D07	3.65	3.66	0.01
25 yr 72 hr	N-CA-D07x	3.81	3.82	0.01
25 yr 72 hr	N-CA-D08	3.4	2.04	-1.36
25 yr 72 hr	N-CA-D08x	3.66	3.66	0
25 yr 72 hr	N-CA-D09x	3.4	2.63	-0.77
25 yr 72 hr	N-CA-E07	4.8	4.77	-0.03
25 yr 72 hr	N-CA-E08	4.82	4.79	-0.03
25 yr 72 hr	N-CA-E09x	5.03	4.8	-0.23
25 yr 72 hr	N-CA-F04	3.56	1.14	-2.42
25 yr 72 hr	N-CA-F05	3.36	1.21	-2.15
25 yr 72 hr	N-CA-F05x	3.43	1.02	-2.41
25 yr 72 hr	N-CA-F06	3.35	1.03	-2.32
25 yr 72 hr	N-CA-F06x	3.33	1.22	-2.11
25 yr 72 hr	N-CA-F07	3.34	0.3	-3.04
25 yr 72 hr	N-CA-F07x	3.33	1.03	-2.3
25 yr 72 hr	N-CA-F08	3.36	-0.29	-3.65
25 yr 72 hr	N-CA-F09	3.36	-0.36	-3.72
25 yr 72 hr	N-CA-F09x	3.36	-0.28	-3.64
25 yr 72 hr	N-CA-F10	3.37	-0.53	-3.9
25 yr 72 hr	N-CA-F11	3.37	-0.61	-3.98
25 yr 72 hr	N-CA-F11x	3.37	-0.36	-3.73
25 yr 72 hr	N-CA-F12	3.37	-1.91	-5.28
25 yr 72 hr	N-CA-F12x	3.37	1.1	-2.27
25 yr 72 hr	N-CA-G08	3.37	1.02	-2.35
25 yr 72 hr	N-CA-G09	3.38	2	-1.38
25 yr 72 hr	N-CA-G10	3.58	3.32	-0.26
25 yr 72 hr	N-CA-G11x	3.56	3.31	-0.25
25 yr 72 hr	N-CA-H09	3.38	-0.17	-3.55
25 yr 72 hr	N-CA-H10	3.38	-0.16	-3.54
25 yr 72 hr	N-CA-H10x	3.37	-0.17	-3.54
25 yr 72 hr	N-CA-H11	3.39	0.03	-3.36
25 yr 72 hr	N-CA-H11x	3.38	-0.2	-3.58
25 yr 72 hr	N-CA-H12	3.39	0.09	-3.3
25 yr 72 hr	N-CA-H13	3.4	1.3	-2.1

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Area BCDE Long Range Alternatives Unselected Alternative (3BC,2DE)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-H14	3.41	1.41	-2
25 yr 72 hr	N-CA-I12	3.39	0.02	-3.37
25 yr 72 hr	N-CA-I13	3.39	0	-3.39
25 yr 72 hr	N-CA-I14	3.39	-0.05	-3.44
25 yr 72 hr	N-CA-J14	3.4	2.24	-1.16
25 yr 72 hr	N-CA-J15x	3.4	2.29	-1.11
25 yr 72 hr	N-CA-K03	3.62	3.26	-0.36
25 yr 72 hr	N-CA-L04	3.6	3.33	-0.27
25 yr 72 hr	N-CA-L05	3.73	3.5	-0.23
25 yr 72 hr	N-CA-M06	3.77	3.52	-0.25
25 yr 72 hr	N-CA-N05	3.66	3.63	-0.03
25 yr 72 hr	N-CA-O08	4.98	5.02	0.04
25 yr 72 hr	N-CA-S05	3.41	1.14	-2.27
25 yr 72 hr	N-CA-T08	3.32	0.17	-3.15
25 yr 72 hr	N-CA-T09	3.32	0.18	-3.14
25 yr 72 hr	N-CB	1.59	4.4	2.81
25 yr 72 hr	N-CB-A01	3.19	-0.67	-3.86
25 yr 72 hr	N-CB-Added	#N/A	-0.93	#N/A
25 yr 72 hr	N-CC	1.59	4.4	2.81
25 yr 72 hr	N-CC-A01	3.15	-0.27	-3.42
25 yr 72 hr	N-CC-A02	3.18	1.08	-2.1
25 yr 72 hr	N-CC-A03	3.31	1.25	-2.06
25 yr 72 hr	N-CE	1.59	4.4	2.81
25 yr 72 hr	N-CE-A01	3.37	-2.02	-5.39
25 yr 72 hr	N-CE-A02	3.37	-0.32	-3.69
25 yr 72 hr	N-CE-A03	3.37	0.51	-2.86
25 yr 72 hr	N-CF	1.59	4.4	2.81
25 yr 72 hr	N-CF-A01	3.38	-2.04	-5.42
25 yr 72 hr	N-CF-A02	3.38	-0.24	-3.62
25 yr 72 hr	N-CF-A03x	3.38	-0.23	-3.61
25 yr 72 hr	N-CG	1.59	4.4	2.81
25 yr 72 hr	N-CG-A01	3.38	2.75	-0.63
25 yr 72 hr	N-CG-A02x	3.39	2.93	-0.46
25 yr 72 hr	N-CG-A03x	3.39	3.11	-0.28
25 yr 72 hr	N-CH	1.59	4.4	2.81
25 yr 72 hr	N-CH-A01b	1.88	3.1	1.22
25 yr 72 hr	N-CH-A02	2.75	3.14	0.39
25 yr 72 hr	N-CH-A03	3.93	3.24	-0.69
25 yr 72 hr	N-CH-A04	4.03	3.25	-0.78
25 yr 72 hr	N-CH-Added	#N/A	3.09	#N/A
25 yr 72 hr	N-CH-B02	2.96	3.17	0.21
25 yr 72 hr	N-CH-B03	3.9	3.27	-0.63
25 yr 72 hr	N-CH-B03x	3.08	3.17	0.09
25 yr 72 hr	N-CH-B04	3.94	3.84	-0.1

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CH-B04x	4.12	3.3	-0.82
25 yr 72 hr	N-CH-B05	4.75	4.53	-0.22
25 yr 72 hr	N-CH-B05x	4.05	3.89	-0.16
25 yr 72 hr	N-CH-B06	4.88	4.86	-0.02
25 yr 72 hr	N-CH-B06x	4.83	4.79	-0.04
25 yr 72 hr	N-CH-B07	5.93	5.93	0
25 yr 72 hr	N-CH-C04	4.02	3.32	-0.7
25 yr 72 hr	N-CH-C05	4.04	3.33	-0.71
25 yr 72 hr	N-CH-C05x1	4.03	3.33	-0.7
25 yr 72 hr	N-CH-C05x2	4.03	3.32	-0.71
25 yr 72 hr	N-CH-C05x3	4.03	3.33	-0.7
25 yr 72 hr	N-CH-C06	4.04	3.34	-0.7
25 yr 72 hr	N-CH-C06x	4.04	3.33	-0.71
25 yr 72 hr	N-CH-C07x	4.04	3.34	-0.7
25 yr 72 hr	N-CH-D05	4.03	3.33	-0.7
25 yr 72 hr	N-CH-D06	4.03	3.33	-0.7
25 yr 72 hr	N-CH-D08x	4.04	3.34	-0.7
25 yr 72 hr	N-CH-E06	4.04	3.34	-0.7
25 yr 72 hr	N-CH-E07	4.04	3.34	-0.7
25 yr 72 hr	N-CH-F07	4.05	3.34	-0.71
25 yr 72 hr	N-CH-F08	4.05	3.34	-0.71
25 yr 72 hr	N-CH-G07	4.03	3.34	-0.69
25 yr 72 hr	N-CH-G08	4.03	3.34	-0.69
25 yr 72 hr	N-CH-G09	4.02	3.34	-0.68
25 yr 72 hr	N-CH-G10	4.02	3.34	-0.68
25 yr 72 hr	N-CH-G11	4.03	3.34	-0.69
25 yr 72 hr	N-CH-I04	3.99	3.31	-0.68
25 yr 72 hr	N-CH-I05x1	4.02	3.33	-0.69
25 yr 72 hr	N-CH-I05x2	4.01	3.33	-0.68
25 yr 72 hr	N-CH-I05x3	4.01	3.33	-0.68
25 yr 72 hr	N-CH-I05x4	4.02	3.33	-0.69
25 yr 72 hr	N-CI	1.59	4.4	2.81
25 yr 72 hr	N-D10	4.03	3.34	-0.69
25 yr 72 hr	N-D16	2.55	3.67	1.12
25 yr 72 hr	N-D19	4.89	4.7	-0.19
25 yr 72 hr	N-D20	4.89	4.5	-0.39
25 yr 72 hr	N-D22	4.86	4.76	-0.1
25 yr 72 hr	N-D30	4.87	4.25	-0.62
25 yr 72 hr	N-DA	1.59	4.4	2.81
25 yr 72 hr	N-DA-A01	3.76	0.49	-3.27
25 yr 72 hr	N-DB	1.59	4.4	2.81
25 yr 72 hr	N-DC	1.59	4.4	2.81
25 yr 72 hr	N-DI-A01	3.98	-0.44	-4.42
25 yr 72 hr	N-DI-A02	4.02	0.49	-3.53

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DI-B04	4.51	1.29	-3.22
25 yr 72 hr	N-DI-B05	4.32	1.44	-2.88
25 yr 72 hr	N-DI-B05x	4.83	1.3	-3.53
25 yr 72 hr	N-DI-B06	4.33	1.57	-2.76
25 yr 72 hr	N-DI-B07	4.83	1.71	-3.12
25 yr 72 hr	N-DI-B08	4.83	1.91	-2.92
25 yr 72 hr	N-DI-B09	4.85	2.24	-2.61
25 yr 72 hr	N-DI-B10	4.87	2.99	-1.88
25 yr 72 hr	N-DI-B10x	4.85	2.26	-2.59
25 yr 72 hr	N-DI-B11	4.86	2.99	-1.87
25 yr 72 hr	N-DI-C03	4.09	0.75	-3.34
25 yr 72 hr	N-DI-C04	4.86	4.69	-0.17
25 yr 72 hr	N-DI-C05	4.76	4.08	-0.68
25 yr 72 hr	N-DP	4.39	2.81	-1.58
25 yr 72 hr	N-DP-A01	4.54	3.29	-1.25
25 yr 72 hr	N-DP-A02	4.59	3.72	-0.87
25 yr 72 hr	N-DP-A04	4.62	3.93	-0.69
25 yr 72 hr	N-DP-A07	4.89	3.61	-1.28
25 yr 72 hr	N-DP-A08	4.89	3.6	-1.29
25 yr 72 hr	N-DP-A09	4.88	3.26	-1.62
25 yr 72 hr	N-DP-A09x	4.89	3.64	-1.25
25 yr 72 hr	N-DP-A10	4.88	3.35	-1.53
25 yr 72 hr	N-DP-A11x	4.88	3.36	-1.52
25 yr 72 hr	N-DP-B2	4.57	3.65	-0.92
25 yr 72 hr	N-DP-C02	4.59	3.59	-1
25 yr 72 hr	N-DP-C03	3.76	1.08	-2.68
25 yr 72 hr	N-DP-C03x	4.59	3.6	-0.99
25 yr 72 hr	N-DP-D02	4.64	3.92	-0.72
25 yr 72 hr	N-DP-D03x	4.87	4.8	-0.07
25 yr 72 hr	N-DP-D04	4.85	4.19	-0.66
25 yr 72 hr	N-DP-D05x	4.88	4.34	-0.54
25 yr 72 hr	N-DP-D06x	4.94	4.5	-0.44
25 yr 72 hr	N-DP-D07x	5.03	4.57	-0.46
25 yr 72 hr	N-DP-D08x	5.1	4.61	-0.49
25 yr 72 hr	N-DP-D09	5.19	4.7	-0.49
25 yr 72 hr	N-DP-D10	5.55	5.51	-0.04
25 yr 72 hr	N-DP-E05	4.89	4.34	-0.55
25 yr 72 hr	N-DP-E06	4.92	4.9	-0.02
25 yr 72 hr	N-DP-E08	4.89	4.69	-0.2
25 yr 72 hr	N-DP-F07	5.89	5.78	-0.11
25 yr 72 hr	N-DP-F08	5.13	4.68	-0.45
25 yr 72 hr	N-DP-F09	5.37	5.11	-0.26
25 yr 72 hr	N-DP-G05	4.58	3.9	-0.68
25 yr 72 hr	N-DP-G06	4.58	3.91	-0.67

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Area BCDE Long Range Alternatives Unselected Alternative (3BC,2DE)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DP-G07	4.58	4	-0.58
25 yr 72 hr	N-DP-G07x	4.57	3.89	-0.68
25 yr 72 hr	N-DP-G08	4.62	4.15	-0.47
25 yr 72 hr	N-DP-G08x	4.58	3.99	-0.59
25 yr 72 hr	N-DP-H04	4.58	3.74	-0.84
25 yr 72 hr	N-DP-H05	4.58	3.77	-0.81
25 yr 72 hr	N-DP-H05x	4.58	3.8	-0.78
25 yr 72 hr	N-DP-H06	4.57	3.8	-0.77
25 yr 72 hr	N-DP-H06x	4.58	4.06	-0.52
25 yr 72 hr	N-DP-K07	4.58	3.87	-0.71
25 yr 72 hr	N-DP-M10	5.26	4.7	-0.56
25 yr 72 hr	N-DP-M11	5.31	4.43	-0.88
25 yr 72 hr	N-DP-M12	5.38	5.28	-0.1
25 yr 72 hr	N-DP-N10	5.12	4.63	-0.49
25 yr 72 hr	N-DP-O10	4.88	3.34	-1.54
25 yr 72 hr	N-DP-O11	4.89	3.49	-1.4
25 yr 72 hr	N-DP-P06	4.64	4.42	-0.22
25 yr 72 hr	N-DP-Y03	5.12	5.12	0
25 yr 72 hr	N-DP-Z12	4.4	4.19	-0.21
25 yr 72 hr	N-DQ-A01	4.55	3.42	-1.13
25 yr 72 hr	N-DQ-A01x	#N/A	3.78	#N/A
25 yr 72 hr	N-DQ-A02	4.56	3.43	-1.13
25 yr 72 hr	N-DQ-A03	4.55	3.2	-1.35
25 yr 72 hr	N-DQ-A03x	3.13	1.68	-1.45
25 yr 72 hr	N-DQ-A04	5.57	5.74	0.17
25 yr 72 hr	N-DQ-A05	4.36	2.46	-1.9
25 yr 72 hr	N-DQ-A06	4.55	3.38	-1.17
25 yr 72 hr	N-DQ-A07	4.55	3.43	-1.12
25 yr 72 hr	N-DQ-A08	4.55	3.47	-1.08
25 yr 72 hr	N-E01	2.93	4.4	1.47
25 yr 72 hr	N-E03	4.02	4.4	0.38
25 yr 72 hr	N-E07	4.54	4.54	0
25 yr 72 hr	N-E08	3.82	4.4	0.58
25 yr 72 hr	N-E10	3.74	4.4	0.66
25 yr 72 hr	N-E11	2.57	3	0.43
25 yr 72 hr	N-EA	1.59	4.4	2.81
25 yr 72 hr	N-EA-A01	3.86	3.85	-0.01
25 yr 72 hr	N-EA-A02	3.86	3.85	-0.01
25 yr 72 hr	N-EB	1.59	4.4	2.81
25 yr 72 hr	N-EB-A01	3.03	3.84	0.81
25 yr 72 hr	N-EC	1.59	4.4	2.81
25 yr 72 hr	N-EC-A01	3.11	3.84	0.73
25 yr 72 hr	N-ED	1.59	4.4	2.81
25 yr 72 hr	N-ED-A01	3.63	3.77	0.14

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-ED-A02	3.64	3.78	0.14
25 yr 72 hr	N-ED-A03	3.64	3.78	0.14
25 yr 72 hr	N-EE	1.59	4.4	2.81
25 yr 72 hr	N-EE-A01	3.71	3.87	0.16
25 yr 72 hr	N-EF	1.59	4.4	2.81
25 yr 72 hr	N-EF-A01	3.71	3.87	0.16
25 yr 72 hr	N-EG	1.59	4.4	2.81
25 yr 72 hr	N-EG-A01	3.46	3.78	0.32
25 yr 72 hr	N-EG-A02	3.66	3.77	0.11
25 yr 72 hr	N-EH	1.59	4.4	2.81
25 yr 72 hr	N-EH-A01	2.02	3.08	1.06
25 yr 72 hr	N-EI	1.59	4.4	2.81
25 yr 72 hr	N-EJ	1.59	4.4	2.81
25 yr 72 hr	N-EJ-A01	1.65	4.4	2.75
25 yr 72 hr	N-EK	1.59	4.4	2.81
25 yr 72 hr	N-EK-A01	3.76	4.4	0.64
25 yr 72 hr	N-EL	1.59	4.4	2.81
25 yr 72 hr	N-EL-A01	3.04	3.02	-0.02
25 yr 72 hr	N-EM	1.59	4.4	2.81
25 yr 72 hr	N-EM-A01	2.83	3	0.17
25 yr 72 hr	N-EM-A02	2.74	3	0.26
25 yr 72 hr	N-EM-A03	2.57	3	0.43
25 yr 72 hr	N-EN	1.59	4.4	2.81
25 yr 72 hr	N-EN-A01	2.92	2.62	-0.3
25 yr 72 hr	N-EO	1.59	4.4	2.81
25 yr 72 hr	N-EO-A01	2.46	2.76	0.3
25 yr 72 hr	N-EP	1.59	4.4	2.81
25 yr 72 hr	N-EP-A01	2.56	3	0.44
25 yr 72 hr	N-EQ	1.59	4.4	2.81
25 yr 72 hr	N-EQ-A01	1.67	4.46	2.79
25 yr 72 hr	N-ER	1.59	4.4	2.81
25 yr 72 hr	N-ES	1.59	4.4	2.81
25 yr 72 hr	N-ET	1.59	4.4	2.81
25 yr 72 hr	N-ET-A01	1.6	2.8	1.2
25 yr 72 hr	NAltAdd_01	#N/A	3.64	#N/A
25 yr 72 hr	NZA-0110	#N/A	3.09	#N/A
25 yr 72 hr	NZA-0120	#N/A	2.95	#N/A
25 yr 72 hr	NZA-0130	#N/A	2.33	#N/A
25 yr 72 hr	NZA-0150	#N/A	3.33	#N/A
25 yr 72 hr	NZA-0160	#N/A	2.58	#N/A
25 yr 72 hr	P-Added-7-DSJ	#N/A	-2.8	#N/A
25 yr 72 hr	P-Added-9-DSJ	#N/A	1.5	#N/A
25 yr 72 hr	P-BA-A01-DSJ	#N/A	3.05	#N/A
25 yr 72 hr	P-BA-D08-Added-6-DS	#N/A	-2.5	#N/A

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Area BCDE Long Range Alternatives Unselected Alternative (3BC,2DE)
25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	P-BB-A01-DSJ	#N/A	2.43	#N/A
25 yr 72 hr	P-BC-A01-DSJ	#N/A	1.5	#N/A
25 yr 72 hr	P-BD-A02-DSJ	#N/A	1.27	#N/A
25 yr 72 hr	P-BE-A01-Added-1-DSJ	#N/A	2.98	#N/A
25 yr 72 hr	P-BE-A01-DSJ	#N/A	3.02	#N/A
25 yr 72 hr	P-CC-A01-DSJ	#N/A	-0.39	#N/A
25 yr 72 hr	P-CE-A01-DSJ	#N/A	-2.12	#N/A
25 yr 72 hr	P-CF-A01-DSJ	#N/A	-2.28	#N/A
25 yr 72 hr	P-CG-A01-DSJ	#N/A	2	#N/A
25 yr 72 hr	P-ED-A01-DSJ	#N/A	2.3	#N/A
25 yr 72 hr	P-EL-A01-DSJ	#N/A	1.51	#N/A
25 yr 72 hr	P-EM-A01-DSJ	#N/A	3	#N/A
25 yr 72 hr	P-EN-A01-DSJ	#N/A	1.8	#N/A
25 yr 72 hr	P-EO-A01-DSJ	#N/A	2	#N/A
25 yr 72 hr	P-EP-A01-DSJ	#N/A	3	#N/A
25 yr 72 hr	oposed-Trunkline-1-D	#N/A	2.93	#N/A
25 yr 72 hr	Pump D2 Node	#N/A	-2.08	#N/A
25 yr 72 hr	Trunkline-Junction-1	#N/A	3.24	#N/A

Long-Range Resilient Alternatives with Existing Condition Tailwater

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Area A Long Range Alternatives Existing Condition Tailwater Selected Alternative (1A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	Added-8-DSJ	#N/A	-1	#N/A
10 YR 1 HR	Added-Junction-1	#N/A	5.8	#N/A
10 YR 1 HR	N-ABA	1.59	1.59	0
10 YR 1 HR	N-ABA-A01	3.66	1.22	-2.44
10 YR 1 HR	N-ABA-A02	3.83	-0.06	-3.89
10 YR 1 HR	N-ABB	1.59	1.59	0
10 YR 1 HR	N-ABB-A01	3.57	-1.47	-5.04
10 YR 1 HR	N-ABB-A02	4.23	0.48	-3.75
10 YR 1 HR	N-ABB-A03	4.23	0.68	-3.55
10 YR 1 HR	N-ABB-A04	4.23	0.75	-3.48
10 YR 1 HR	N-ABB-B02	4.25	-0.52	-4.77
10 YR 1 HR	N-ABB-B03	4.27	0.32	-3.95
10 YR 1 HR	N-ABB-B03x	4.28	-0.4	-4.68
10 YR 1 HR	N-ABB-B04	4.28	0.93	-3.35
10 YR 1 HR	N-ABC	1.59	1.59	0
10 YR 1 HR	N-ABC-A01	4.21	3.28	-0.93
10 YR 1 HR	N-ABC-A02	4.22	3.39	-0.83
10 YR 1 HR	N-ABC-B02	4.21	3.32	-0.89
10 YR 1 HR	N-ABD	1.59	1.59	0
10 YR 1 HR	N-ABD-A01	3.33	3.16	-0.17
10 YR 1 HR	N-ABD-A02	4.06	3.43	-0.63
10 YR 1 HR	N-ABD-A02x	3.76	3.24	-0.52
10 YR 1 HR	N-ABD-A03	4.64	3.74	-0.9
10 YR 1 HR	N-ABD-A03x	4.11	3.64	-0.47
10 YR 1 HR	N-ABD-A04	4.95	3.75	-1.2
10 YR 1 HR	N-ABD-A05	5.18	3.74	-1.44
10 YR 1 HR	N-ABD-A06	5.19	2.7	-2.49
10 YR 1 HR	N-ABD-A07	5.19	2.71	-2.48
10 YR 1 HR	N-ABD-B04	5.43	4.04	-1.39
10 YR 1 HR	N-ABD-B05	5.52	4.2	-1.32
10 YR 1 HR	N-ABD-B05x	5.43	4.05	-1.38
10 YR 1 HR	N-ABD-B06	5.53	4.24	-1.29
10 YR 1 HR	N-ABD-B07	6.17	4.95	-1.22
10 YR 1 HR	N-ABD-B08	7.41	7.41	0
10 YR 1 HR	N-ABE	1.59	1.59	0
10 YR 1 HR	N-ABE-A01	2.05	3.32	1.27
10 YR 1 HR	N-ABE-A02	2.68	3.81	1.13
10 YR 1 HR	N-ABF	1.59	1.59	0
10 YR 1 HR	N-ABF-A01	4.11	3.6	-0.51
10 YR 1 HR	N-ABF-A02	4.11	3.62	-0.49
10 YR 1 HR	N-ABG	1.59	1.59	0
10 YR 1 HR	N-ABG-A01	4.53	2.79	-1.74
10 YR 1 HR	N-ABG-A02	4.76	2.58	-2.18
10 YR 1 HR	N-ABG-A03	4.79	2.51	-2.28

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Area A Long Range Alternatives Existing Condition Tailwater Selected Alternative (1A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ABH	1.59	1.59	0
10 YR 1 HR	N-ABH-A01	4.07	1.79	-2.28
10 YR 1 HR	N-ABH-A02	4.98	1.41	-3.57
10 YR 1 HR	N-ABH-A03	4.98	3.32	-1.66
10 YR 1 HR	N-ABH-A03x	4.98	3.22	-1.76
10 YR 1 HR	N-ABH-B02	5.02	2.14	-2.88
10 YR 1 HR	N-ABH-B03	5.03	2.32	-2.71
10 YR 1 HR	N-ABH-B03x	5.03	4.19	-0.84
10 YR 1 HR	N-ABH-B04	5.04	2.33	-2.71
10 YR 1 HR	N-ABI	1.59	1.59	0
10 YR 1 HR	N-ABI-A01	4.93	3.72	-1.21
10 YR 1 HR	N-ABI-A02	4.93	1.6	-3.33
10 YR 1 HR	N-ABJ	1.59	1.59	0
10 YR 1 HR	N-ABJ-A01	4.95	3.37	-1.58
10 YR 1 HR	N-ABJ-A02	4.95	1.57	-3.38
10 YR 1 HR	N-ABK	1.59	1.59	0
10 YR 1 HR	N-ABK-A01	3.71	3.99	0.28
10 YR 1 HR	N-ABK-A02x1	5.66	5.5	-0.16
10 YR 1 HR	N-ABK-A02x2	5.67	5.53	-0.14
10 YR 1 HR	N-ABK-B02	4.99	4.26	-0.73
10 YR 1 HR	N-ABK-B03	4.99	4.29	-0.7
10 YR 1 HR	N-ABK-B04	7.48	5.61	-1.87
10 YR 1 HR	N-ABL	1.59	1.59	0
10 YR 1 HR	N-ABL-A01	3.41	4.38	0.97
10 YR 1 HR	N-ABL-A02	4.33	4.4	0.07
10 YR 1 HR	N-ABM	1.59	1.59	0
10 YR 1 HR	N-ABM-A01	4.74	4.43	-0.31
10 YR 1 HR	N-ABM-A02	4.74	4.45	-0.29
10 YR 1 HR	N-ABN	1.59	1.59	0
10 YR 1 HR	N-ABN-A01	9.68	9.51	-0.17
10 YR 1 HR	N-ABO	1.59	1.59	0
10 YR 1 HR	N-ABO-A01	3.81	3.5	-0.31
10 YR 1 HR	N-ABO-A02	5.2	5.45	0.25
10 YR 1 HR	N-ABP	1.59	1.59	0
10 YR 1 HR	N-ABQ	1.59	1.59	0
10 YR 1 HR	N-ADA-A01	6.1	5.58	-0.52
10 YR 1 HR	N-ADA-A02	6.92	5.73	-1.19
10 YR 1 HR	N-ADA-A03	6.93	5.82	-1.11
10 YR 1 HR	N-ADA-A03x	6.92	5.73	-1.19
10 YR 1 HR	N-ADA-A04	6.94	5.87	-1.07
10 YR 1 HR	N-ADA-A05	6.94	5.88	-1.06
10 YR 1 HR	N-ADA-B02	6.57	5.59	-0.98
10 YR 1 HR	N-ADA-B03	6.57	5.6	-0.97
10 YR 1 HR	N-ADA-B03x	6.57	5.6	-0.97

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Area A Long Range Alternatives Existing Condition Tailwater Selected Alternative (1A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADA-B04	7.22	5.6	-1.62
10 YR 1 HR	N-ADB-08	7.07	7.06	-0.01
10 YR 1 HR	N-ADB-A01	7.3	5.63	-1.67
10 YR 1 HR	N-ADB-A02	7.48	5.68	-1.8
10 YR 1 HR	N-ADB-A03	8.47	5.7	-2.77
10 YR 1 HR	N-ADB-A04	8.84	5.7	-3.14
10 YR 1 HR	N-ADB-A04x	8.76	5.7	-3.06
10 YR 1 HR	N-ADB-B03	7.49	5.84	-1.65
10 YR 1 HR	N-ADB-B04	8.83	6.34	-2.49
10 YR 1 HR	N-ADB-B05	8.86	7.98	-0.88
10 YR 1 HR	N-ADB-B06	9.16	9.09	-0.07
10 YR 1 HR	N-ADB-B07	9.7	9.53	-0.17
10 YR 1 HR	N-ADB-B07x	9.66	9.51	-0.15
10 YR 1 HR	N-ADC-A01	7.96	5.52	-2.44
10 YR 1 HR	N-ADC-A02	7.97	5.52	-2.45
10 YR 1 HR	N-ADD-A01	7.8	6.87	-0.93
10 YR 1 HR	N-ADD-A02	7.93	7.1	-0.83
10 YR 1 HR	N-ADD-A03	10.93	8.57	-2.36
10 YR 1 HR	N-ADD-A04	10.93	8.98	-1.95
10 YR 1 HR	N-ADD-A04x	10.93	8.57	-2.36
10 YR 1 HR	N-ADD-A05	10.98	9.62	-1.36
10 YR 1 HR	N-ADD-A06	10.99	10.25	-0.74
10 YR 1 HR	N-ADD-A07	12.51	11.17	-1.34
10 YR 1 HR	N-ADD-A08	12.53	11.51	-1.02
10 YR 1 HR	N-ADD-A09	12.59	11.77	-0.82
10 YR 1 HR	N-ADD-A10	12.59	12.02	-0.57
10 YR 1 HR	N-ADD-A11	12.64	12.32	-0.32
10 YR 1 HR	N-ADD-A12	13.08	12.63	-0.45
10 YR 1 HR	N-ADD-A13	13.36	13.03	-0.33
10 YR 1 HR	N-ADD-A14	13.37	13.04	-0.33
10 YR 1 HR	N-ADD-A15	13.35	13.02	-0.33
10 YR 1 HR	N-ADD-A16	13.25	13.02	-0.23
10 YR 1 HR	N-ADD-B03	7.95	7.14	-0.81
10 YR 1 HR	N-ADD-B05	11.67	11.67	0
10 YR 1 HR	N-ADD-C04	10.94	10.66	-0.28
10 YR 1 HR	N-ADD-C05	11.24	11.24	0
10 YR 1 HR	N-ADD-D08	12.01	11.55	-0.46
10 YR 1 HR	N-ADD-D09	11.87	11.71	-0.16
10 YR 1 HR	N-ADD-H04	10.93	10.42	-0.51
10 YR 1 HR	N-ADD-N13	12.88	12.64	-0.24
10 YR 1 HR	N-ADD-N14	13.15	12.73	-0.42
10 YR 1 HR	N-ADD-N15	12.55	12.69	0.14
10 YR 1 HR	N-ADE-A01	6.96	5.95	-1.01
10 YR 1 HR	N-ADE-A02	8.4	6.45	-1.95

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Area A Long Range Alternatives Existing Condition Tailwater Selected Alternative (1A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADE-A03	8.68	6.78	-1.9
10 YR 1 HR	N-ADE-A04	9.1	8.17	-0.93
10 YR 1 HR	N-ADE-A04x	8.7	6.78	-1.92
10 YR 1 HR	N-ADE-A05	10.84	10.84	0
10 YR 1 HR	N-ADE-A05x	9.1	8.19	-0.91
10 YR 1 HR	N-ADE-A06	11.2	11.2	0
10 YR 1 HR	N-ADE-B02	7.01	6	-1.01
10 YR 1 HR	N-ADE-B03	7.02	6.01	-1.01
10 YR 1 HR	N-ADE-C02	7.52	6.03	-1.49
10 YR 1 HR	N-ADE-C03	7.54	6.14	-1.4
10 YR 1 HR	N-ADE-D03	7	6.02	-0.98
10 YR 1 HR	N-ADS-A01	5.67	5.63	-0.04
10 YR 1 HR	N-ADS-A02	5.99	5.69	-0.3
10 YR 1 HR	N-ASA-A01	5.41	5.45	0.04
10 YR 1 HR	N-ASA-A02	5.41	5.45	0.04
10 YR 1 HR	N-ASA-A03	5.61	5.45	-0.16
10 YR 1 HR	N-ASA-A04	5.72	5.45	-0.27
10 YR 1 HR	N-ASA-A05	5.89	5.46	-0.43
10 YR 1 HR	N-ASA-A06	6.09	5.46	-0.63
10 YR 1 HR	N-ASA-A07	6.12	5.46	-0.66
10 YR 1 HR	N-ASB-A01	5.55	5.45	-0.1
10 YR 1 HR	N-ASB-A02	5.55	5.45	-0.1
10 YR 1 HR	N-ASB-B02	5.8	5.47	-0.33
10 YR 1 HR	N-ASC-A01	5.32	5.53	0.21
10 YR 1 HR	N-ASC-A02	5.99	5.68	-0.31
10 YR 1 HR	N-ASC-A03	6.24	5.7	-0.54
10 YR 1 HR	N-ASC-A04	6.5	5.71	-0.79
10 YR 1 HR	N-ASC-B02	5.61	5.53	-0.08
10 YR 1 HR	N-ASC-B03	5.65	5.53	-0.12
10 YR 1 HR	N-ASD-A01a	5.82	6.03	0.21
10 YR 1 HR	N-ASD-A02	8.07	8.12	0.05
10 YR 1 HR	N-ASD-A03	8.89	8.91	0.02
10 YR 1 HR	N-ASD-A04	9.95	9.96	0.01
10 YR 1 HR	N-ASD-A05	10.3	10.3	0
10 YR 1 HR	N-ASD-A06	10.99	10.99	0
10 YR 1 HR	N-ASD-A07	11.55	11.55	0
10 YR 1 HR	N-ASD-A08	12.21	12.21	0
10 YR 1 HR	N-ASD-A09	13.04	13.04	0
10 YR 1 HR	N-ASD-A11	14.02	14.02	0
10 YR 1 HR	N-ASD-A12	14.91	14.91	0
10 YR 1 HR	N-ASD-A13	15.49	15.49	0
10 YR 1 HR	N-ASD-A14	15.82	15.82	0
10 YR 1 HR	N-ASD-A15	16.4	16.4	0
10 YR 1 HR	N-ASD-A16	14.3	14.3	0

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Area A Long Range Alternatives Existing Condition Tailwater Selected Alternative (1A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASD-A17	16.61	16.61	0
10 YR 1 HR	N-ASD-A18	15.58	15.58	0
10 YR 1 HR	N-ASD-A19	14.92	14.92	0
10 YR 1 HR	N-ASD-B02	5.9	6.08	0.18
10 YR 1 HR	N-ASD-B03	7.08	7.13	0.05
10 YR 1 HR	N-ASD-B04	7.52	7.55	0.03
10 YR 1 HR	N-ASD-B05	8.63	8.64	0.01
10 YR 1 HR	N-ASD-C03	6.06	6.15	0.09
10 YR 1 HR	N-ASD-C04	6.08	6.12	0.04
10 YR 1 HR	N-ASD-D04	7.85	7.87	0.02
10 YR 1 HR	N-ASD-D05	8.43	8.43	0
10 YR 1 HR	N-ASD-D06	8.14	8.14	0
10 YR 1 HR	N-ASD-D07	8.49	8.49	0
10 YR 1 HR	N-ASD-E04	9.39	9.4	0.01
10 YR 1 HR	N-ASD-E05	10.23	10.24	0.01
10 YR 1 HR	N-ASD-E06	10.4	10.4	0
10 YR 1 HR	N-ASD-E09	14.14	14.13	-0.01
10 YR 1 HR	N-ASD-E10	13.84	13.84	0
10 YR 1 HR	N-ASD-F03	8.62	8.18	-0.44
10 YR 1 HR	N-ASD-F04	9.24	9.18	-0.06
10 YR 1 HR	N-ASD-F05	9.67	9.58	-0.09
10 YR 1 HR	N-ASD-G04	8.9	8.92	0.02
10 YR 1 HR	N-ASD-H07	9.29	9.29	0
10 YR 1 HR	N-ASD-H08	9.42	9.42	0
10 YR 1 HR	N-ASD-I09	10.85	10.85	0
10 YR 1 HR	N-ASD-J10	12.51	12.51	0
10 YR 1 HR	N-ASD-K10	13.86	13.86	0
10 YR 1 HR	N-ASD-L07	10.46	10.46	0
10 YR 1 HR	N-ASD-Q06	10.32	10.32	0
10 YR 1 HR	N-ASD-Q08	11.23	11.23	0
10 YR 1 HR	N-ASD-Q09	12.64	12.64	0
10 YR 1 HR	N-ASD-R13	14.22	14.22	0
10 YR 1 HR	N-ASD-S13	14.84	14.84	0
10 YR 1 HR	N-ASD-T15	16.56	16.56	0
10 YR 1 HR	N-ASD-U06	10.26	10.26	0
10 YR 1 HR	N-ASE-A01	5.62	5.81	0.19
10 YR 1 HR	N-ASE-A02	5.82	6.01	0.19
10 YR 1 HR	N-ASE-A03	7.99	6.27	-1.72
10 YR 1 HR	N-ASE-A04	7.99	6.32	-1.67
10 YR 1 HR	N-ASE-A05	11.37	11.37	0
10 YR 1 HR	N-ASE-B02	5.67	5.81	0.14
10 YR 1 HR	N-ASE-C03	6.14	6.78	0.64
10 YR 1 HR	N-ASE-D03	6.79	7.93	1.14
10 YR 1 HR	N-ASF-A01	6.28	5.46	-0.82

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Area A Long Range Alternatives Existing Condition Tailwater Selected Alternative (1A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASF-A02	6.28	5.47	-0.81
10 YR 1 HR	N-ASG-A01	5.69	5.5	-0.19
10 YR 1 HR	N-ASG-A02	6.03	5.54	-0.49
10 YR 1 HR	N-ASG-A03	6.51	5.55	-0.96
10 YR 1 HR	N-ASG-A04	7.03	5.57	-1.46
10 YR 1 HR	N-ASG-A05	7.03	5.58	-1.45
10 YR 1 HR	N-ASG-A06	7.11	7.11	0
10 YR 1 HR	N-ASG-B02	5.72	5.51	-0.21
10 YR 1 HR	N-ASG-B03x	5.72	5.51	-0.21
10 YR 1 HR	N-ASG-C04	6.42	5.56	-0.86
10 YR 1 HR	N-ASG-C05	6.4	5.57	-0.83
10 YR 1 HR	N-ASH-A01	5.56	5.48	-0.08
10 YR 1 HR	N-ASH-A02	5.65	5.65	0
10 YR 1 HR	N-ASI-A01	5.43	5.44	0.01
10 YR 1 HR	N-ASJ	1.59	1.59	0
10 YR 1 HR	N-ASJ-A01	5.69	5.69	0
10 YR 1 HR	N-ASK-A01	5.42	5.48	0.06
10 YR 1 HR	P-ABB-A01-DSJ	#N/A	-1.98	#N/A
10 YR 1 HR	P-ABD-A01-DSJ	#N/A	-0.8	#N/A
10 YR 1 HR	P-ABK-A01-DSJ	#N/A	3.95	#N/A
10 YR 1 HR	P-ABO-A01-DSJ	#N/A	3.5	#N/A

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Area A Long Range Alternatives Existing Conditions Tailwater Selected Alternatives (1A)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 Hr FC	Added-8-DSJ	#N/A	-0.99	#N/A
25 YR 72 Hr FC	Added-Junction-1	#N/A	6.76	#N/A
25 YR 72 Hr FC	N-ABA	1.59	1.59	0
25 YR 72 Hr FC	N-ABA-A01	4.85	1.87	-2.98
25 YR 72 Hr FC	N-ABA-A02	4.85	1.86	-2.99
25 YR 72 Hr FC	N-ABB	1.59	1.59	0
25 YR 72 Hr FC	N-ABB-A01	4.04	0.38	-3.66
25 YR 72 Hr FC	N-ABB-A02	4.87	0.83	-4.04
25 YR 72 Hr FC	N-ABB-A03	4.88	1.07	-3.81
25 YR 72 Hr FC	N-ABB-A04	4.88	1.15	-3.73
25 YR 72 Hr FC	N-ABB-B02	4.87	1.81	-3.06
25 YR 72 Hr FC	N-ABB-B03	4.87	3.98	-0.89
25 YR 72 Hr FC	N-ABB-B03x	4.87	1.82	-3.05
25 YR 72 Hr FC	N-ABB-B04	4.87	3.99	-0.88
25 YR 72 Hr FC	N-ABC	1.59	1.59	0
25 YR 72 Hr FC	N-ABC-A01	4.89	4.12	-0.77
25 YR 72 Hr FC	N-ABC-A02	4.89	4.13	-0.76
25 YR 72 Hr FC	N-ABC-B02	4.89	4.13	-0.76
25 YR 72 Hr FC	N-ABD	1.59	1.59	0
25 YR 72 Hr FC	N-ABD-A01	4.91	3.98	-0.93
25 YR 72 Hr FC	N-ABD-A02	4.92	4.17	-0.75
25 YR 72 Hr FC	N-ABD-A02x	4.92	4	-0.92
25 YR 72 Hr FC	N-ABD-A03	5.22	4.69	-0.53
25 YR 72 Hr FC	N-ABD-A03x	4.93	4.18	-0.75
25 YR 72 Hr FC	N-ABD-A04	5.6	4.71	-0.89
25 YR 72 Hr FC	N-ABD-A05	5.66	4.77	-0.89
25 YR 72 Hr FC	N-ABD-A06	5.28	4.2	-1.08
25 YR 72 Hr FC	N-ABD-A07	5.28	4.22	-1.06
25 YR 72 Hr FC	N-ABD-B04	5.73	5.12	-0.61
25 YR 72 Hr FC	N-ABD-B05	5.74	5.3	-0.44
25 YR 72 Hr FC	N-ABD-B05x	5.72	5.13	-0.59
25 YR 72 Hr FC	N-ABD-B06	5.74	5.32	-0.42
25 YR 72 Hr FC	N-ABD-B07	6.82	6.47	-0.35
25 YR 72 Hr FC	N-ABD-B08	7.49	7.49	0
25 YR 72 Hr FC	N-ABE	1.59	1.59	0
25 YR 72 Hr FC	N-ABE-A01	4.89	4.12	-0.77
25 YR 72 Hr FC	N-ABE-A02	4.89	4.13	-0.76
25 YR 72 Hr FC	N-ABF	1.59	1.59	0
25 YR 72 Hr FC	N-ABF-A01	4.88	4.26	-0.62
25 YR 72 Hr FC	N-ABF-A02	4.89	4.26	-0.63
25 YR 72 Hr FC	N-ABG	1.59	1.59	0
25 YR 72 Hr FC	N-ABG-A01	5.04	4.07	-0.97
25 YR 72 Hr FC	N-ABG-A02	5.04	4.06	-0.98
25 YR 72 Hr FC	N-ABG-A03	5.05	3.97	-1.08

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Area A Long Range Alternatives Existing Conditions Tailwater Selected Alternatives (1A)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 Hr FC	N-ABH	1.59	1.59	0
25 YR 72 Hr FC	N-ABH-A01	4.6	2.91	-1.69
25 YR 72 Hr FC	N-ABH-A02	5.53	2.32	-3.21
25 YR 72 Hr FC	N-ABH-A03	5.53	3.44	-2.09
25 YR 72 Hr FC	N-ABH-A03x	5.53	3.33	-2.2
25 YR 72 Hr FC	N-ABH-B02	5.57	3.45	-2.12
25 YR 72 Hr FC	N-ABH-B03	5.58	3.72	-1.86
25 YR 72 Hr FC	N-ABH-B03x	5.59	4.65	-0.94
25 YR 72 Hr FC	N-ABH-B04	5.59	3.74	-1.85
25 YR 72 Hr FC	N-ABI	1.59	1.59	0
25 YR 72 Hr FC	N-ABI-A01	5.52	3.84	-1.68
25 YR 72 Hr FC	N-ABI-A02	5.52	2.63	-2.89
25 YR 72 Hr FC	N-ABJ	1.59	1.59	0
25 YR 72 Hr FC	N-ABJ-A01	5.52	3.5	-2.02
25 YR 72 Hr FC	N-ABJ-A02	5.52	2.57	-2.95
25 YR 72 Hr FC	N-ABK	1.59	1.59	0
25 YR 72 Hr FC	N-ABK-A01	4.39	3.93	-0.46
25 YR 72 Hr FC	N-ABK-A02x1	6.85	6.57	-0.28
25 YR 72 Hr FC	N-ABK-A02x2	6.86	6.6	-0.26
25 YR 72 Hr FC	N-ABK-B02	5.47	3.94	-1.53
25 YR 72 Hr FC	N-ABK-B03	5.47	3.96	-1.51
25 YR 72 Hr FC	N-ABK-B04	7.51	6.54	-0.97
25 YR 72 Hr FC	N-ABL	1.59	1.59	0
25 YR 72 Hr FC	N-ABL-A01	5.23	4.26	-0.97
25 YR 72 Hr FC	N-ABL-A02	5.22	4.41	-0.81
25 YR 72 Hr FC	N-ABM	1.59	1.59	0
25 YR 72 Hr FC	N-ABM-A01	5.22	4.4	-0.82
25 YR 72 Hr FC	N-ABM-A02	5.22	4.44	-0.78
25 YR 72 Hr FC	N-ABN	1.59	1.59	0
25 YR 72 Hr FC	N-ABN-A01	9.84	9.67	-0.17
25 YR 72 Hr FC	N-ABO	1.59	1.59	0
25 YR 72 Hr FC	N-ABO-A01	4.42	3.5	-0.92
25 YR 72 Hr FC	N-ABO-A02	5.48	6.12	0.64
25 YR 72 Hr FC	N-ABP	1.59	1.59	0
25 YR 72 Hr FC	N-ABQ	1.59	1.59	0
25 YR 72 Hr FC	N-ADA-A01	6.84	6.58	-0.26
25 YR 72 Hr FC	N-ADA-A02	7.42	6.68	-0.74
25 YR 72 Hr FC	N-ADA-A03	7.42	6.69	-0.73
25 YR 72 Hr FC	N-ADA-A03x	7.41	6.69	-0.72
25 YR 72 Hr FC	N-ADA-A04	7.44	6.71	-0.73
25 YR 72 Hr FC	N-ADA-A05	7.44	6.71	-0.73
25 YR 72 Hr FC	N-ADA-B02	7.08	6.52	-0.56
25 YR 72 Hr FC	N-ADA-B03	7.07	6.51	-0.56
25 YR 72 Hr FC	N-ADA-B03x	7.07	6.51	-0.56

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Area A Long Range Alternatives Existing Conditions Tailwater Selected Alternatives (1A)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 Hr FC	N-ADA-B04	7.24	6.54	-0.7
25 YR 72 Hr FC	N-ADB-08	7.46	7.12	-0.34
25 YR 72 Hr FC	N-ADB-A01	7.6	6.87	-0.73
25 YR 72 Hr FC	N-ADB-A02	7.61	6.97	-0.64
25 YR 72 Hr FC	N-ADB-A03	8.59	7.04	-1.55
25 YR 72 Hr FC	N-ADB-A04	8.88	7.05	-1.83
25 YR 72 Hr FC	N-ADB-A04x	8.83	7.04	-1.79
25 YR 72 Hr FC	N-ADB-B03	7.62	7.33	-0.29
25 YR 72 Hr FC	N-ADB-B04	8.94	8.65	-0.29
25 YR 72 Hr FC	N-ADB-B05	8.97	8.75	-0.22
25 YR 72 Hr FC	N-ADB-B06	9.25	9.21	-0.04
25 YR 72 Hr FC	N-ADB-B07	9.87	9.71	-0.16
25 YR 72 Hr FC	N-ADB-B07x	9.8	9.65	-0.15
25 YR 72 Hr FC	N-ADC-A01	8.23	6.6	-1.63
25 YR 72 Hr FC	N-ADC-A02	8.23	6.61	-1.62
25 YR 72 Hr FC	N-ADD-A01	8.55	7.3	-1.25
25 YR 72 Hr FC	N-ADD-A02	8.75	7.63	-1.12
25 YR 72 Hr FC	N-ADD-A03	10.99	9.4	-1.59
25 YR 72 Hr FC	N-ADD-A04	10.99	9.84	-1.15
25 YR 72 Hr FC	N-ADD-A04x	10.99	9.4	-1.59
25 YR 72 Hr FC	N-ADD-A05	11.03	10.49	-0.54
25 YR 72 Hr FC	N-ADD-A06	11.04	10.74	-0.3
25 YR 72 Hr FC	N-ADD-A07	12.55	11.54	-1.01
25 YR 72 Hr FC	N-ADD-A08	12.57	11.87	-0.7
25 YR 72 Hr FC	N-ADD-A09	12.63	12.08	-0.55
25 YR 72 Hr FC	N-ADD-A10	12.63	12.25	-0.38
25 YR 72 Hr FC	N-ADD-A11	12.67	12.49	-0.18
25 YR 72 Hr FC	N-ADD-A12	13.12	12.74	-0.38
25 YR 72 Hr FC	N-ADD-A13	13.39	13.17	-0.22
25 YR 72 Hr FC	N-ADD-A14	13.38	13.18	-0.2
25 YR 72 Hr FC	N-ADD-A15	13.36	13.16	-0.2
25 YR 72 Hr FC	N-ADD-A16	13.26	13.14	-0.12
25 YR 72 Hr FC	N-ADD-B03	8.8	7.7	-1.1
25 YR 72 Hr FC	N-ADD-B05	11.74	11.74	0
25 YR 72 Hr FC	N-ADD-C04	11	10.69	-0.31
25 YR 72 Hr FC	N-ADD-C05	11.27	11.27	0
25 YR 72 Hr FC	N-ADD-D08	12.02	11.72	-0.3
25 YR 72 Hr FC	N-ADD-D09	11.9	11.79	-0.11
25 YR 72 Hr FC	N-ADD-H04	10.99	10.68	-0.31
25 YR 72 Hr FC	N-ADD-N13	12.9	12.74	-0.16
25 YR 72 Hr FC	N-ADD-N14	13.17	12.82	-0.35
25 YR 72 Hr FC	N-ADD-N15	12.56	12.74	0.18
25 YR 72 Hr FC	N-ADE-A01	7.76	6.86	-0.9
25 YR 72 Hr FC	N-ADE-A02	8.62	7.18	-1.44

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 Hr FC	N-ADE-A03	8.76	7.49	-1.27
25 YR 72 Hr FC	N-ADE-A04	9.15	8.68	-0.47
25 YR 72 Hr FC	N-ADE-A04x	8.78	7.5	-1.28
25 YR 72 Hr FC	N-ADE-A05	10.89	10.89	0
25 YR 72 Hr FC	N-ADE-A05x	9.15	8.68	-0.47
25 YR 72 Hr FC	N-ADE-A06	11.25	11.25	0
25 YR 72 Hr FC	N-ADE-B02	7.3	6.87	-0.43
25 YR 72 Hr FC	N-ADE-B03	7.3	6.87	-0.43
25 YR 72 Hr FC	N-ADE-C02	7.77	6.89	-0.88
25 YR 72 Hr FC	N-ADE-C03	7.78	6.95	-0.83
25 YR 72 Hr FC	N-ADE-D03	7.28	6.87	-0.41
25 YR 72 Hr FC	N-ADS-A01	6.41	6.41	0
25 YR 72 Hr FC	N-ADS-A02	6.41	6.41	0
25 YR 72 Hr FC	N-ASA-A01	5.51	5.99	0.48
25 YR 72 Hr FC	N-ASA-A02	5.51	5.99	0.48
25 YR 72 Hr FC	N-ASA-A03	5.78	5.99	0.21
25 YR 72 Hr FC	N-ASA-A04	5.92	6	0.08
25 YR 72 Hr FC	N-ASA-A05	6.09	6.01	-0.08
25 YR 72 Hr FC	N-ASA-A06	6.17	6.02	-0.15
25 YR 72 Hr FC	N-ASA-A07	6.19	6.02	-0.17
25 YR 72 Hr FC	N-ASB-A01	5.59	6.01	0.42
25 YR 72 Hr FC	N-ASB-A02	5.59	6.01	0.42
25 YR 72 Hr FC	N-ASB-B02	5.83	6.01	0.18
25 YR 72 Hr FC	N-ASC-A01	5.68	6.43	0.75
25 YR 72 Hr FC	N-ASC-A02	6.83	6.97	0.14
25 YR 72 Hr FC	N-ASC-A03	7.11	7.02	-0.09
25 YR 72 Hr FC	N-ASC-A04	7.12	7.03	-0.09
25 YR 72 Hr FC	N-ASC-B02	6.17	6.43	0.26
25 YR 72 Hr FC	N-ASC-B03	6.26	6.44	0.18
25 YR 72 Hr FC	N-ASD-A01a	6.3	7.04	0.74
25 YR 72 Hr FC	N-ASD-A02	8.51	9.01	0.5
25 YR 72 Hr FC	N-ASD-A03	9.34	9.7	0.36
25 YR 72 Hr FC	N-ASD-A04	10.42	10.59	0.17
25 YR 72 Hr FC	N-ASD-A05	10.77	10.91	0.14
25 YR 72 Hr FC	N-ASD-A06	11.44	11.54	0.1
25 YR 72 Hr FC	N-ASD-A07	11.89	11.97	0.08
25 YR 72 Hr FC	N-ASD-A08	12.44	12.49	0.05
25 YR 72 Hr FC	N-ASD-A09	13.17	13.19	0.02
25 YR 72 Hr FC	N-ASD-A11	14.09	14.1	0.01
25 YR 72 Hr FC	N-ASD-A12	15.03	15.03	0
25 YR 72 Hr FC	N-ASD-A13	15.62	15.62	0
25 YR 72 Hr FC	N-ASD-A14	15.92	15.92	0
25 YR 72 Hr FC	N-ASD-A15	16.41	16.41	0
25 YR 72 Hr FC	N-ASD-A16	14.31	14.31	0

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Area A Long Range Alternatives Existing Conditions Tailwater Selected Alternatives (1A)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 Hr FC	N-ASD-A17	16.62	16.62	0
25 YR 72 Hr FC	N-ASD-A18	15.58	15.58	0
25 YR 72 Hr FC	N-ASD-A19	14.93	14.93	0
25 YR 72 Hr FC	N-ASD-B02	6.43	7.19	0.76
25 YR 72 Hr FC	N-ASD-B03	7.84	8.34	0.5
25 YR 72 Hr FC	N-ASD-B04	8.09	8.47	0.38
25 YR 72 Hr FC	N-ASD-B05	8.8	8.89	0.09
25 YR 72 Hr FC	N-ASD-C03	8.95	9.05	0.1
25 YR 72 Hr FC	N-ASD-C04	7.11	7.33	0.22
25 YR 72 Hr FC	N-ASD-D04	8.96	9.05	0.09
25 YR 72 Hr FC	N-ASD-D05	9	9.06	0.06
25 YR 72 Hr FC	N-ASD-D06	8.77	8.79	0.02
25 YR 72 Hr FC	N-ASD-D07	9.07	9.11	0.04
25 YR 72 Hr FC	N-ASD-E04	9.84	10.14	0.3
25 YR 72 Hr FC	N-ASD-E05	10.78	10.92	0.14
25 YR 72 Hr FC	N-ASD-E06	10.98	11.11	0.13
25 YR 72 Hr FC	N-ASD-E09	14.21	14.22	0.01
25 YR 72 Hr FC	N-ASD-E10	13.9	13.91	0.01
25 YR 72 Hr FC	N-ASD-F03	9	9.1	0.1
25 YR 72 Hr FC	N-ASD-F04	9.28	9.29	0.01
25 YR 72 Hr FC	N-ASD-F05	9.69	9.69	0
25 YR 72 Hr FC	N-ASD-G04	9.35	9.71	0.36
25 YR 72 Hr FC	N-ASD-H07	9.55	9.55	0
25 YR 72 Hr FC	N-ASD-H08	9.55	9.55	0
25 YR 72 Hr FC	N-ASD-I09	10.9	10.9	0
25 YR 72 Hr FC	N-ASD-J10	12.54	12.54	0
25 YR 72 Hr FC	N-ASD-K10	13.9	13.9	0
25 YR 72 Hr FC	N-ASD-L07	11.3	11.31	0.01
25 YR 72 Hr FC	N-ASD-Q06	10.93	11.07	0.14
25 YR 72 Hr FC	N-ASD-Q08	11.7	11.77	0.07
25 YR 72 Hr FC	N-ASD-Q09	12.78	12.8	0.02
25 YR 72 Hr FC	N-ASD-R13	14.25	14.25	0
25 YR 72 Hr FC	N-ASD-S13	14.85	14.85	0
25 YR 72 Hr FC	N-ASD-T15	16.56	16.56	0
25 YR 72 Hr FC	N-ASD-U06	10.79	10.93	0.14
25 YR 72 Hr FC	N-ASE-A01	6.11	6.78	0.67
25 YR 72 Hr FC	N-ASE-A02	6.38	7.32	0.94
25 YR 72 Hr FC	N-ASE-A03	9.1	7.99	-1.11
25 YR 72 Hr FC	N-ASE-A04	9.11	7.99	-1.12
25 YR 72 Hr FC	N-ASE-A05	11.45	11.45	0
25 YR 72 Hr FC	N-ASE-B02	6.14	6.78	0.64
25 YR 72 Hr FC	N-ASE-C03	7.04	8.14	1.1
25 YR 72 Hr FC	N-ASE-D03	7.87	8.15	0.28
25 YR 72 Hr FC	N-ASF-A01	6.47	6.24	-0.23

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Area A Long Range Alternatives Existing Conditions Tailwater Selected Alternatives (1A)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 Hr FC	N-ASF-A02	6.47	6.24	-0.23
25 YR 72 Hr FC	N-ASG-A01	5.93	6.16	0.23
25 YR 72 Hr FC	N-ASG-A02	6.27	6.26	-0.01
25 YR 72 Hr FC	N-ASG-A03	6.8	6.3	-0.5
25 YR 72 Hr FC	N-ASG-A04	7.46	6.39	-1.07
25 YR 72 Hr FC	N-ASG-A05	7.46	6.42	-1.04
25 YR 72 Hr FC	N-ASG-A06	7.13	7.13	0
25 YR 72 Hr FC	N-ASG-B02	5.94	6.14	0.2
25 YR 72 Hr FC	N-ASG-B03x	5.94	6.15	0.21
25 YR 72 Hr FC	N-ASG-C04	6.54	6.31	-0.23
25 YR 72 Hr FC	N-ASG-C05	6.45	6.32	-0.13
25 YR 72 Hr FC	N-ASH-A01	5.94	6.15	0.21
25 YR 72 Hr FC	N-ASH-A02	5.94	6.15	0.21
25 YR 72 Hr FC	N-ASI-A01	5.47	5.61	0.14
25 YR 72 Hr FC	N-ASJ	1.59	1.59	0
25 YR 72 Hr FC	N-ASJ-A01	5.71	6.12	0.41
25 YR 72 Hr FC	N-ASK-A01	5.55	6.14	0.59
25 YR 72 Hr FC	P-ABB-A01-DSJ	#N/A	-1.97	#N/A
25 YR 72 Hr FC	P-ABD-A01-DSJ	#N/A	-0.8	#N/A
25 YR 72 Hr FC	P-ABK-A01-DSJ	#N/A	3.9	#N/A
25 YR 72 Hr FC	P-ABO-A01-DSJ	#N/A	3.5	#N/A

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Area A Long Range Alternatives Existing Condition Tailwater
Unselected Alternative (2A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	J-ABK-A02	#N/A	-1.02	#N/A
10 YR 1 HR	Junction-1	#N/A	4.4	#N/A
10 YR 1 HR	Junction-2	#N/A	4.4	#N/A
10 YR 1 HR	Junction-3	#N/A	4.4	#N/A
10 YR 1 HR	Junction-4	#N/A	4.4	#N/A
10 YR 1 HR	Junction-5	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-01	#N/A	-1.69	#N/A
10 YR 1 HR	Junction-Add-02	#N/A	-2.54	#N/A
10 YR 1 HR	Junction-Add-03	#N/A	-1.02	#N/A
10 YR 1 HR	Junction-Add-04	#N/A	-2.14	#N/A
10 YR 1 HR	Junction-Add-05	#N/A	-1.81	#N/A
10 YR 1 HR	Junction-Add-06	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-07	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-08	#N/A	-1.5	#N/A
10 YR 1 HR	Junction-Add-09	#N/A	-0.49	#N/A
10 YR 1 HR	Junction-Add-10	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-11	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-12	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-13	#N/A	-5	#N/A
10 YR 1 HR	Junction-Add-14	#N/A	-4.94	#N/A
10 YR 1 HR	N-ABA	1.59	4.4	2.81
10 YR 1 HR	N-ABA-A01	3.66	-5	-8.66
10 YR 1 HR	N-ABA-A02	3.83	-5	-8.83
10 YR 1 HR	N-ABB	1.59	4.4	2.81
10 YR 1 HR	N-ABB-A01	3.57	-5	-8.57
10 YR 1 HR	N-ABB-A02	4.23	-5	-9.23
10 YR 1 HR	N-ABB-A03	4.23	-5	-9.23
10 YR 1 HR	N-ABB-A04	4.23	-5	-9.23
10 YR 1 HR	N-ABB-B02	4.25	-5	-9.25
10 YR 1 HR	N-ABB-B03	4.27	-5	-9.27
10 YR 1 HR	N-ABB-B03x	4.28	-5	-9.28
10 YR 1 HR	N-ABB-B04	4.28	-5	-9.28
10 YR 1 HR	N-ABC	1.59	4.4	2.81
10 YR 1 HR	N-ABC-A01	4.21	-5	-9.21
10 YR 1 HR	N-ABC-A02	4.22	-5	-9.22
10 YR 1 HR	N-ABC-B02	4.21	-5	-9.21
10 YR 1 HR	N-ABD	1.59	4.4	2.81
10 YR 1 HR	N-ABD-A01	3.33	-5	-8.33
10 YR 1 HR	N-ABD-A02	4.06	-5	-9.06
10 YR 1 HR	N-ABD-A02x	3.76	-5	-8.76
10 YR 1 HR	N-ABD-A03	4.64	-5	-9.64
10 YR 1 HR	N-ABD-A03x	4.11	-5	-9.11
10 YR 1 HR	N-ABD-A04	4.95	-5	-9.95
10 YR 1 HR	N-ABD-A05	5.18	-5	-10.18

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ABD-A06	5.19	-5	-10.19
10 YR 1 HR	N-ABD-A07	5.19	-5	-10.19
10 YR 1 HR	N-ABD-B04	5.43	-5	-10.43
10 YR 1 HR	N-ABD-B05	5.52	-5	-10.52
10 YR 1 HR	N-ABD-B05x	5.43	-5	-10.43
10 YR 1 HR	N-ABD-B06	5.53	-5	-10.53
10 YR 1 HR	N-ABD-B07	6.17	-5	-11.17
10 YR 1 HR	N-ABD-B08	7.41	-5	-12.41
10 YR 1 HR	N-ABE	1.59	4.4	2.81
10 YR 1 HR	N-ABE-A01	2.05	-0.49	-2.54
10 YR 1 HR	N-ABE-A02	2.68	-0.49	-3.17
10 YR 1 HR	N-ABF	1.59	4.4	2.81
10 YR 1 HR	N-ABF-A01	4.11	-1.5	-5.61
10 YR 1 HR	N-ABF-A02	4.11	-1.5	-5.61
10 YR 1 HR	N-ABG	1.59	4.4	2.81
10 YR 1 HR	N-ABG-A01	4.53	-5	-9.53
10 YR 1 HR	N-ABG-A02	4.76	-5	-9.76
10 YR 1 HR	N-ABG-A03	4.79	-5	-9.79
10 YR 1 HR	N-ABH	1.59	4.4	2.81
10 YR 1 HR	N-ABH-A01	4.07	-5	-9.07
10 YR 1 HR	N-ABH-A02	4.98	-5	-9.98
10 YR 1 HR	N-ABH-A03	4.98	-5	-9.98
10 YR 1 HR	N-ABH-A03x	4.98	-5	-9.98
10 YR 1 HR	N-ABH-B02	5.02	-5	-10.02
10 YR 1 HR	N-ABH-B03	5.03	-5	-10.03
10 YR 1 HR	N-ABH-B03x	5.03	-5	-10.03
10 YR 1 HR	N-ABH-B04	5.04	-5	-10.04
10 YR 1 HR	N-ABI	1.59	4.4	2.81
10 YR 1 HR	N-ABI-A01	4.93	-1.81	-6.74
10 YR 1 HR	N-ABI-A02	4.93	-1.81	-6.74
10 YR 1 HR	N-ABJ	1.59	4.4	2.81
10 YR 1 HR	N-ABJ-A01	4.95	-2.14	-7.09
10 YR 1 HR	N-ABJ-A02	4.95	-2.14	-7.09
10 YR 1 HR	N-ABK	1.59	4.4	2.81
10 YR 1 HR	N-ABK-A01	3.71	-1.02	-4.73
10 YR 1 HR	N-ABK-A02x1	5.66	-1.02	-6.68
10 YR 1 HR	N-ABK-A02x2	5.67	4.35	-1.32
10 YR 1 HR	N-ABK-B02	4.99	-1.02	-6.01
10 YR 1 HR	N-ABK-B03	4.99	-1.02	-6.01
10 YR 1 HR	N-ABK-B04	7.48	-1.02	-8.5
10 YR 1 HR	N-ABL	1.59	4.4	2.81
10 YR 1 HR	N-ABL-A01	3.41	-2.54	-5.95
10 YR 1 HR	N-ABL-A02	4.33	-2.54	-6.87
10 YR 1 HR	N-ABM	1.59	4.4	2.81

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Area A Long Range Alternatives Existing Condition Tailwater
Unselected Alternative (2A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ABM-A01	4.74	-1.69	-6.43
10 YR 1 HR	N-ABM-A02	4.74	-1.69	-6.43
10 YR 1 HR	N-ABN	1.59	4.4	2.81
10 YR 1 HR	N-ABN-A01	9.68	-5	-14.68
10 YR 1 HR	N-ABO	1.59	4.4	2.81
10 YR 1 HR	N-ABO-A01	3.81	-4.94	-8.75
10 YR 1 HR	N-ABO-A02	5.2	4.4	-0.8
10 YR 1 HR	N-ABP	1.59	4.4	2.81
10 YR 1 HR	N-ABQ	1.59	4.4	2.81
10 YR 1 HR	N-ADA-A01	6.1	-1.02	-7.12
10 YR 1 HR	N-ADA-A02	6.92	-1.02	-7.94
10 YR 1 HR	N-ADA-A03	6.93	-1.02	-7.95
10 YR 1 HR	N-ADA-A03x	6.92	-1.02	-7.94
10 YR 1 HR	N-ADA-A04	6.94	-1.02	-7.96
10 YR 1 HR	N-ADA-A05	6.94	-1.02	-7.96
10 YR 1 HR	N-ADA-B02	6.57	-1.02	-7.59
10 YR 1 HR	N-ADA-B03	6.57	-1.02	-7.59
10 YR 1 HR	N-ADA-B03x	6.57	-1.02	-7.59
10 YR 1 HR	N-ADA-B04	7.22	-1.02	-8.24
10 YR 1 HR	N-ADB-08	7.07	4.7	-2.37
10 YR 1 HR	N-ADB-A01	7.3	-1.02	-8.32
10 YR 1 HR	N-ADB-A02	7.48	-1.02	-8.5
10 YR 1 HR	N-ADB-A03	8.47	-1.02	-9.49
10 YR 1 HR	N-ADB-A04	8.84	-1.02	-9.86
10 YR 1 HR	N-ADB-A04x	8.76	-1.02	-9.78
10 YR 1 HR	N-ADB-B03	7.49	-1.02	-8.51
10 YR 1 HR	N-ADB-B04	8.83	-1.02	-9.85
10 YR 1 HR	N-ADB-B05	8.86	-1.02	-9.88
10 YR 1 HR	N-ADB-B06	9.16	-5	-14.16
10 YR 1 HR	N-ADB-B07	9.7	-5	-14.7
10 YR 1 HR	N-ADB-B07x	9.66	-5	-14.66
10 YR 1 HR	N-ADC-A01	7.96	-1.02	-8.98
10 YR 1 HR	N-ADC-A02	7.97	-1.02	-8.99
10 YR 1 HR	N-ADD-A01	7.8	4.35	-3.45
10 YR 1 HR	N-ADD-A02	7.93	4.35	-3.58
10 YR 1 HR	N-ADD-A03	10.93	4.35	-6.58
10 YR 1 HR	N-ADD-A04	10.93	4.35	-6.58
10 YR 1 HR	N-ADD-A04x	10.93	4.35	-6.58
10 YR 1 HR	N-ADD-A05	10.98	4.35	-6.63
10 YR 1 HR	N-ADD-A06	10.99	4.35	-6.64
10 YR 1 HR	N-ADD-A07	12.51	4.69	-7.82
10 YR 1 HR	N-ADD-A08	12.53	5.18	-7.35
10 YR 1 HR	N-ADD-A09	12.59	6.64	-5.95
10 YR 1 HR	N-ADD-A10	12.59	6.68	-5.91

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Area A Long Range Alternatives Existing Condition Tailwater
Unselected Alternative (2A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ADD-A11	12.64	6.87	-5.77
10 YR 1 HR	N-ADD-A12	13.08	7.76	-5.32
10 YR 1 HR	N-ADD-A13	13.36	7.74	-5.62
10 YR 1 HR	N-ADD-A14	13.37	7.73	-5.64
10 YR 1 HR	N-ADD-A15	13.35	8.16	-5.19
10 YR 1 HR	N-ADD-A16	13.25	7.86	-5.39
10 YR 1 HR	N-ADD-B03	7.95	4.35	-3.6
10 YR 1 HR	N-ADD-B05	11.67	10.6	-1.07
10 YR 1 HR	N-ADD-C04	10.94	4.4	-6.54
10 YR 1 HR	N-ADD-C05	11.24	10.2	-1.04
10 YR 1 HR	N-ADD-D08	12.01	7.2	-4.81
10 YR 1 HR	N-ADD-D09	11.87	7.46	-4.41
10 YR 1 HR	N-ADD-H04	10.93	6.7	-4.23
10 YR 1 HR	N-ADD-N13	12.88	7.63	-5.25
10 YR 1 HR	N-ADD-N14	13.15	7.4	-5.75
10 YR 1 HR	N-ADD-N15	12.55	7.1	-5.45
10 YR 1 HR	N-ADE-A01	6.96	-5	-11.96
10 YR 1 HR	N-ADE-A02	8.4	-5	-13.4
10 YR 1 HR	N-ADE-A03	8.68	-5	-13.68
10 YR 1 HR	N-ADE-A04	9.1	-5	-14.1
10 YR 1 HR	N-ADE-A04x	8.7	-5	-13.7
10 YR 1 HR	N-ADE-A05	10.84	-5	-15.84
10 YR 1 HR	N-ADE-A05x	9.1	-5	-14.1
10 YR 1 HR	N-ADE-A06	11.2	10.6	-0.6
10 YR 1 HR	N-ADE-B02	7.01	-5	-12.01
10 YR 1 HR	N-ADE-B03	7.02	-5	-12.02
10 YR 1 HR	N-ADE-C02	7.52	-5	-12.52
10 YR 1 HR	N-ADE-C03	7.54	-5	-12.54
10 YR 1 HR	N-ADE-D03	7	-5	-12
10 YR 1 HR	N-ADS-A01	5.67	-1.02	-6.69
10 YR 1 HR	N-ADS-A02	5.99	-1.02	-7.01
10 YR 1 HR	N-ASA-A01	5.41	-5	-10.41
10 YR 1 HR	N-ASA-A02	5.41	-5	-10.41
10 YR 1 HR	N-ASA-A03	5.61	-5	-10.61
10 YR 1 HR	N-ASA-A04	5.72	-5	-10.72
10 YR 1 HR	N-ASA-A05	5.89	-5	-10.89
10 YR 1 HR	N-ASA-A06	6.09	-5	-11.09
10 YR 1 HR	N-ASA-A07	6.12	-5	-11.12
10 YR 1 HR	N-ASB-A01	5.55	-5	-10.55
10 YR 1 HR	N-ASB-A02	5.55	-5	-10.55
10 YR 1 HR	N-ASB-B02	5.8	-5	-10.8
10 YR 1 HR	N-ASC-A01	5.32	-5	-10.32
10 YR 1 HR	N-ASC-A02	5.99	-5	-10.99
10 YR 1 HR	N-ASC-A03	6.24	-5	-11.24

Area A Long Range Alternatives Existing Condition Tailwater
Unselected Alternative (2A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASC-A04	6.5	-5	-11.5
10 YR 1 HR	N-ASC-B02	5.61	-5	-10.61
10 YR 1 HR	N-ASC-B03	5.65	-5	-10.65
10 YR 1 HR	N-ASD-A01a	5.82	4.4	-1.42
10 YR 1 HR	N-ASD-A02	8.07	4.4	-3.67
10 YR 1 HR	N-ASD-A03	8.89	4.4	-4.49
10 YR 1 HR	N-ASD-A04	9.95	4.4	-5.55
10 YR 1 HR	N-ASD-A05	10.3	5.3	-5
10 YR 1 HR	N-ASD-A06	10.99	7.2	-3.79
10 YR 1 HR	N-ASD-A07	11.55	7.8	-3.75
10 YR 1 HR	N-ASD-A08	12.21	9	-3.21
10 YR 1 HR	N-ASD-A09	13.04	10	-3.04
10 YR 1 HR	N-ASD-A11	14.02	10.6	-3.42
10 YR 1 HR	N-ASD-A12	14.91	12.4	-2.51
10 YR 1 HR	N-ASD-A13	15.49	12.7	-2.79
10 YR 1 HR	N-ASD-A14	15.82	13.6	-2.22
10 YR 1 HR	N-ASD-A15	16.4	14.4	-2
10 YR 1 HR	N-ASD-A16	14.3	12.2	-2.1
10 YR 1 HR	N-ASD-A17	16.61	15.2	-1.41
10 YR 1 HR	N-ASD-A18	15.58	14.6	-0.98
10 YR 1 HR	N-ASD-A19	14.92	13.8	-1.12
10 YR 1 HR	N-ASD-B02	5.9	4.4	-1.5
10 YR 1 HR	N-ASD-B03	7.08	4.4	-2.68
10 YR 1 HR	N-ASD-B04	7.52	4.4	-3.12
10 YR 1 HR	N-ASD-B05	8.63	4.4	-4.23
10 YR 1 HR	N-ASD-C03	6.06	4.4	-1.66
10 YR 1 HR	N-ASD-C04	6.08	4.4	-1.68
10 YR 1 HR	N-ASD-D04	7.85	4.4	-3.45
10 YR 1 HR	N-ASD-D05	8.43	6.7	-1.73
10 YR 1 HR	N-ASD-D06	8.14	3.72	-4.42
10 YR 1 HR	N-ASD-D07	8.49	5.36	-3.13
10 YR 1 HR	N-ASD-E04	9.39	5.4	-3.99
10 YR 1 HR	N-ASD-E05	10.23	5.9	-4.33
10 YR 1 HR	N-ASD-E06	10.4	6.1	-4.3
10 YR 1 HR	N-ASD-E09	14.14	9.8	-4.34
10 YR 1 HR	N-ASD-E10	13.84	10.6	-3.24
10 YR 1 HR	N-ASD-F03	8.62	4.4	-4.22
10 YR 1 HR	N-ASD-F04	9.24	4.4	-4.84
10 YR 1 HR	N-ASD-F05	9.67	-0.9	-10.57
10 YR 1 HR	N-ASD-G04	8.9	7.5	-1.4
10 YR 1 HR	N-ASD-H07	9.29	6.1	-3.19
10 YR 1 HR	N-ASD-H08	9.42	8.8	-0.62
10 YR 1 HR	N-ASD-I09	10.85	9.3	-1.55
10 YR 1 HR	N-ASD-J10	12.51	10	-2.51

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Area A Long Range Alternatives Existing Condition Tailwater
Unselected Alternative (2A)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 YR 1 HR	N-ASD-K10	13.86	10.6	-3.26
10 YR 1 HR	N-ASD-L07	10.46	6.5	-3.96
10 YR 1 HR	N-ASD-Q06	10.32	6.5	-3.82
10 YR 1 HR	N-ASD-Q08	11.23	7.4	-3.83
10 YR 1 HR	N-ASD-Q09	12.64	7.4	-5.24
10 YR 1 HR	N-ASD-R13	14.22	10.6	-3.62
10 YR 1 HR	N-ASD-S13	14.84	12.8	-2.04
10 YR 1 HR	N-ASD-T15	16.56	13.6	-2.96
10 YR 1 HR	N-ASD-U06	10.26	7.2	-3.06
10 YR 1 HR	N-ASE-A01	5.62	4.4	-1.22
10 YR 1 HR	N-ASE-A02	5.82	4.4	-1.42
10 YR 1 HR	N-ASE-A03	7.99	4.4	-3.59
10 YR 1 HR	N-ASE-A04	7.99	4.4	-3.59
10 YR 1 HR	N-ASE-A05	11.37	10.3	-1.07
10 YR 1 HR	N-ASE-B02	5.67	4.4	-1.27
10 YR 1 HR	N-ASE-C03	6.14	4.4	-1.74
10 YR 1 HR	N-ASE-D03	6.79	4.4	-2.39
10 YR 1 HR	N-ASF-A01	6.28	4.4	-1.88
10 YR 1 HR	N-ASF-A02	6.28	4.4	-1.88
10 YR 1 HR	N-ASG-A01	5.69	4.4	-1.29
10 YR 1 HR	N-ASG-A02	6.03	4.4	-1.63
10 YR 1 HR	N-ASG-A03	6.51	4.4	-2.11
10 YR 1 HR	N-ASG-A04	7.03	4.4	-2.63
10 YR 1 HR	N-ASG-A05	7.03	4.4	-2.63
10 YR 1 HR	N-ASG-A06	7.11	6.5	-0.61
10 YR 1 HR	N-ASG-B02	5.72	4.4	-1.32
10 YR 1 HR	N-ASG-B03x	5.72	4.4	-1.32
10 YR 1 HR	N-ASG-C04	6.42	4.4	-2.02
10 YR 1 HR	N-ASG-C05	6.4	4.4	-2
10 YR 1 HR	N-ASH-A01	5.56	4.4	-1.16
10 YR 1 HR	N-ASH-A02	5.65	5.4	-0.25
10 YR 1 HR	N-ASI-A01	5.43	4.4	-1.03
10 YR 1 HR	N-ASJ	1.59	4.4	2.81
10 YR 1 HR	N-ASJ-A01	5.69	0	-5.69
10 YR 1 HR	N-ASK-A01	5.42	0	-5.42

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Area A Long Range Alternatives Existing Condition Tailwater
Unselected Alternative (2A) 25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	J-ABK-A02	#N/A	6.17	#N/A
25 YR 72 HR	Junction-1	#N/A	6.18	#N/A
25 YR 72 HR	Junction-2	#N/A	6.36	#N/A
25 YR 72 HR	Junction-3	#N/A	6.16	#N/A
25 YR 72 HR	Junction-4	#N/A	6.36	#N/A
25 YR 72 HR	Junction-5	#N/A	4.21	#N/A
25 YR 72 HR	Junction-Add-01	#N/A	1.31	#N/A
25 YR 72 HR	Junction-Add-02	#N/A	0.46	#N/A
25 YR 72 HR	Junction-Add-03	#N/A	2.84	#N/A
25 YR 72 HR	Junction-Add-04	#N/A	0.86	#N/A
25 YR 72 HR	Junction-Add-05	#N/A	1.19	#N/A
25 YR 72 HR	Junction-Add-06	#N/A	-2	#N/A
25 YR 72 HR	Junction-Add-07	#N/A	-2	#N/A
25 YR 72 HR	Junction-Add-08	#N/A	1.5	#N/A
25 YR 72 HR	Junction-Add-09	#N/A	2.51	#N/A
25 YR 72 HR	Junction-Add-10	#N/A	1.16	#N/A
25 YR 72 HR	Junction-Add-11	#N/A	-1.98	#N/A
25 YR 72 HR	Junction-Add-12	#N/A	1.13	#N/A
25 YR 72 HR	Junction-Add-13	#N/A	-1.99	#N/A
25 YR 72 HR	Junction-Add-14	#N/A	-1.94	#N/A
25 YR 72 HR	N-ABA	1.59	1.59	0
25 YR 72 HR	N-ABA-A01	4.85	2.75	-2.1
25 YR 72 HR	N-ABA-A02	4.85	2.66	-2.19
25 YR 72 HR	N-ABB	1.59	1.59	0
25 YR 72 HR	N-ABB-A01	4.04	3.08	-0.96
25 YR 72 HR	N-ABB-A02	4.87	3.12	-1.75
25 YR 72 HR	N-ABB-A03	4.88	3.14	-1.74
25 YR 72 HR	N-ABB-A04	4.88	3.21	-1.67
25 YR 72 HR	N-ABB-B02	4.87	3.11	-1.76
25 YR 72 HR	N-ABB-B03	4.87	3.25	-1.62
25 YR 72 HR	N-ABB-B03x	4.87	3	-1.87
25 YR 72 HR	N-ABB-B04	4.87	3.13	-1.74
25 YR 72 HR	N-ABC	1.59	1.59	0
25 YR 72 HR	N-ABC-A01	4.89	3.16	-1.73
25 YR 72 HR	N-ABC-A02	4.89	3.37	-1.52
25 YR 72 HR	N-ABC-B02	4.89	3.22	-1.67
25 YR 72 HR	N-ABD	1.59	1.59	0
25 YR 72 HR	N-ABD-A01	4.91	3.26	-1.65
25 YR 72 HR	N-ABD-A02	4.92	3.44	-1.48
25 YR 72 HR	N-ABD-A02x	4.92	3.3	-1.62
25 YR 72 HR	N-ABD-A03	5.22	3.64	-1.58
25 YR 72 HR	N-ABD-A03x	4.93	3.73	-1.2
25 YR 72 HR	N-ABD-A04	5.6	3.68	-1.92
25 YR 72 HR	N-ABD-A05	5.66	3.79	-1.87

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Area A Long Range Alternatives Existing Condition Tailwater
Unselected Alternative (2A) 25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ABD-A06	5.28	3.49	-1.79
25 YR 72 HR	N-ABD-A07	5.28	3.51	-1.77
25 YR 72 HR	N-ABD-B04	5.73	4.11	-1.62
25 YR 72 HR	N-ABD-B05	5.74	4.35	-1.39
25 YR 72 HR	N-ABD-B05x	5.72	4.13	-1.59
25 YR 72 HR	N-ABD-B06	5.74	4.41	-1.33
25 YR 72 HR	N-ABD-B07	6.82	5.48	-1.34
25 YR 72 HR	N-ABD-B08	7.49	7.49	0
25 YR 72 HR	N-ABE	1.59	1.59	0
25 YR 72 HR	N-ABE-A01	4.89	2.68	-2.21
25 YR 72 HR	N-ABE-A02	4.89	3.34	-1.55
25 YR 72 HR	N-ABF	1.59	1.59	0
25 YR 72 HR	N-ABF-A01	4.88	1.73	-3.15
25 YR 72 HR	N-ABF-A02	4.89	1.76	-3.13
25 YR 72 HR	N-ABG	1.59	1.59	0
25 YR 72 HR	N-ABG-A01	5.04	0.7	-4.34
25 YR 72 HR	N-ABG-A02	5.04	3.38	-1.66
25 YR 72 HR	N-ABG-A03	5.05	3.4	-1.65
25 YR 72 HR	N-ABH	1.59	1.59	0
25 YR 72 HR	N-ABH-A01	4.6	-1.64	-6.24
25 YR 72 HR	N-ABH-A02	5.53	4.13	-1.4
25 YR 72 HR	N-ABH-A03	5.53	4.17	-1.36
25 YR 72 HR	N-ABH-A03x	5.53	4.15	-1.38
25 YR 72 HR	N-ABH-B02	5.57	3.64	-1.93
25 YR 72 HR	N-ABH-B03	5.58	3.42	-2.16
25 YR 72 HR	N-ABH-B03x	5.59	4.66	-0.93
25 YR 72 HR	N-ABH-B04	5.59	3.43	-2.16
25 YR 72 HR	N-ABI	1.59	1.59	0
25 YR 72 HR	N-ABI-A01	5.52	1.4	-4.12
25 YR 72 HR	N-ABI-A02	5.52	3.68	-1.84
25 YR 72 HR	N-ABJ	1.59	1.59	0
25 YR 72 HR	N-ABJ-A01	5.52	1.35	-4.17
25 YR 72 HR	N-ABJ-A02	5.52	3.28	-2.24
25 YR 72 HR	N-ABK	1.59	1.59	0
25 YR 72 HR	N-ABK-A01	4.39	4.21	-0.18
25 YR 72 HR	N-ABK-A02x1	6.85	6.71	-0.14
25 YR 72 HR	N-ABK-A02x2	6.86	6.72	-0.14
25 YR 72 HR	N-ABK-B02	5.47	4.28	-1.19
25 YR 72 HR	N-ABK-B03	5.47	4.33	-1.14
25 YR 72 HR	N-ABK-B04	7.51	6.61	-0.9
25 YR 72 HR	N-ABL	1.59	1.59	0
25 YR 72 HR	N-ABL-A01	5.23	2	-3.23
25 YR 72 HR	N-ABL-A02	5.22	4.41	-0.81
25 YR 72 HR	N-ABM	1.59	1.59	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ABM-A01	5.22	2.07	-3.15
25 YR 72 HR	N-ABM-A02	5.22	4.08	-1.14
25 YR 72 HR	N-ABN	1.59	1.59	0
25 YR 72 HR	N-ABN-A01	9.84	9.67	-0.17
25 YR 72 HR	N-ABO	1.59	1.59	0
25 YR 72 HR	N-ABO-A01	4.42	1.45	-2.97
25 YR 72 HR	N-ABO-A02	5.48	5.67	0.19
25 YR 72 HR	N-ABP	1.59	1.59	0
25 YR 72 HR	N-ABQ	1.59	1.59	0
25 YR 72 HR	N-ADA-A01	6.84	6.67	-0.17
25 YR 72 HR	N-ADA-A02	7.42	6.83	-0.59
25 YR 72 HR	N-ADA-A03	7.42	6.83	-0.59
25 YR 72 HR	N-ADA-A03x	7.41	6.83	-0.58
25 YR 72 HR	N-ADA-A04	7.44	6.86	-0.58
25 YR 72 HR	N-ADA-A05	7.44	6.86	-0.58
25 YR 72 HR	N-ADA-B02	7.08	6.5	-0.58
25 YR 72 HR	N-ADA-B03	7.07	6.49	-0.58
25 YR 72 HR	N-ADA-B03x	7.07	6.49	-0.58
25 YR 72 HR	N-ADA-B04	7.24	6.57	-0.67
25 YR 72 HR	N-ADB-08	7.46	7.12	-0.34
25 YR 72 HR	N-ADB-A01	7.6	6.83	-0.77
25 YR 72 HR	N-ADB-A02	7.61	6.91	-0.7
25 YR 72 HR	N-ADB-A03	8.59	6.93	-1.66
25 YR 72 HR	N-ADB-A04	8.88	6.93	-1.95
25 YR 72 HR	N-ADB-A04x	8.83	6.93	-1.9
25 YR 72 HR	N-ADB-B03	7.62	7.25	-0.37
25 YR 72 HR	N-ADB-B04	8.94	8.33	-0.61
25 YR 72 HR	N-ADB-B05	8.97	8.64	-0.33
25 YR 72 HR	N-ADB-B06	9.25	9.21	-0.04
25 YR 72 HR	N-ADB-B07	9.87	9.7	-0.17
25 YR 72 HR	N-ADB-B07x	9.8	9.65	-0.15
25 YR 72 HR	N-ADC-A01	8.23	6.72	-1.51
25 YR 72 HR	N-ADC-A02	8.23	6.72	-1.51
25 YR 72 HR	N-ADD-A01	8.55	6.74	-1.81
25 YR 72 HR	N-ADD-A02	8.75	6.9	-1.85
25 YR 72 HR	N-ADD-A03	10.99	7.45	-3.54
25 YR 72 HR	N-ADD-A04	10.99	8.06	-2.93
25 YR 72 HR	N-ADD-A04x	10.99	7.45	-3.54
25 YR 72 HR	N-ADD-A05	11.03	8.99	-2.04
25 YR 72 HR	N-ADD-A06	11.04	9.35	-1.69
25 YR 72 HR	N-ADD-A07	12.55	10.69	-1.86
25 YR 72 HR	N-ADD-A08	12.57	11.2	-1.37
25 YR 72 HR	N-ADD-A09	12.63	11.58	-1.05
25 YR 72 HR	N-ADD-A10	12.63	11.98	-0.65

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Area A Long Range Alternatives Existing Condition Tailwater
Unselected Alternative (2A) 25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ADD-A11	12.67	12.33	-0.34
25 YR 72 HR	N-ADD-A12	13.12	12.68	-0.44
25 YR 72 HR	N-ADD-A13	13.39	13.14	-0.25
25 YR 72 HR	N-ADD-A14	13.38	13.15	-0.23
25 YR 72 HR	N-ADD-A15	13.36	13.13	-0.23
25 YR 72 HR	N-ADD-A16	13.26	13.12	-0.14
25 YR 72 HR	N-ADD-B03	8.8	6.98	-1.82
25 YR 72 HR	N-ADD-B05	11.74	11.74	0
25 YR 72 HR	N-ADD-C04	11	10.69	-0.31
25 YR 72 HR	N-ADD-C05	11.27	11.27	0
25 YR 72 HR	N-ADD-D08	12.02	11.51	-0.51
25 YR 72 HR	N-ADD-D09	11.9	11.71	-0.19
25 YR 72 HR	N-ADD-H04	10.99	10.66	-0.33
25 YR 72 HR	N-ADD-N13	12.9	12.68	-0.22
25 YR 72 HR	N-ADD-N14	13.17	12.78	-0.39
25 YR 72 HR	N-ADD-N15	12.56	12.72	0.16
25 YR 72 HR	N-ADE-A01	7.76	6.05	-1.71
25 YR 72 HR	N-ADE-A02	8.62	7.03	-1.59
25 YR 72 HR	N-ADE-A03	8.76	7.52	-1.24
25 YR 72 HR	N-ADE-A04	9.15	8.85	-0.3
25 YR 72 HR	N-ADE-A04x	8.78	7.53	-1.25
25 YR 72 HR	N-ADE-A05	10.89	10.89	0
25 YR 72 HR	N-ADE-A05x	9.15	8.86	-0.29
25 YR 72 HR	N-ADE-A06	11.25	11.25	0
25 YR 72 HR	N-ADE-B02	7.3	6.12	-1.18
25 YR 72 HR	N-ADE-B03	7.3	6.13	-1.17
25 YR 72 HR	N-ADE-C02	7.77	5.87	-1.9
25 YR 72 HR	N-ADE-C03	7.78	6.05	-1.73
25 YR 72 HR	N-ADE-D03	7.28	6.15	-1.13
25 YR 72 HR	N-ADS-A01	6.41	6.39	-0.02
25 YR 72 HR	N-ADS-A02	6.41	6.39	-0.02
25 YR 72 HR	N-ASA-A01	5.51	3.64	-1.87
25 YR 72 HR	N-ASA-A02	5.51	3.63	-1.88
25 YR 72 HR	N-ASA-A03	5.78	3.7	-2.08
25 YR 72 HR	N-ASA-A04	5.92	3.75	-2.17
25 YR 72 HR	N-ASA-A05	6.09	3.84	-2.25
25 YR 72 HR	N-ASA-A06	6.17	3.92	-2.25
25 YR 72 HR	N-ASA-A07	6.19	3.93	-2.26
25 YR 72 HR	N-ASB-A01	5.59	3.89	-1.7
25 YR 72 HR	N-ASB-A02	5.59	3.82	-1.77
25 YR 72 HR	N-ASB-B02	5.83	3.9	-1.93
25 YR 72 HR	N-ASC-A01	5.68	4.14	-1.54
25 YR 72 HR	N-ASC-A02	6.83	5.26	-1.57
25 YR 72 HR	N-ASC-A03	7.11	5.33	-1.78

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Area A Long Range Alternatives Existing Condition Tailwater
Unselected Alternative (2A) 25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASC-A04	7.12	5.38	-1.74
25 YR 72 HR	N-ASC-B02	6.17	4.07	-2.1
25 YR 72 HR	N-ASC-B03	6.26	4.11	-2.15
25 YR 72 HR	N-ASD-A01a	6.3	6.84	0.54
25 YR 72 HR	N-ASD-A02	8.51	8.83	0.32
25 YR 72 HR	N-ASD-A03	9.34	9.58	0.24
25 YR 72 HR	N-ASD-A04	10.42	10.54	0.12
25 YR 72 HR	N-ASD-A05	10.77	10.87	0.1
25 YR 72 HR	N-ASD-A06	11.44	11.51	0.07
25 YR 72 HR	N-ASD-A07	11.89	11.95	0.06
25 YR 72 HR	N-ASD-A08	12.44	12.48	0.04
25 YR 72 HR	N-ASD-A09	13.17	13.18	0.01
25 YR 72 HR	N-ASD-A11	14.09	14.1	0.01
25 YR 72 HR	N-ASD-A12	15.03	15.03	0
25 YR 72 HR	N-ASD-A13	15.62	15.62	0
25 YR 72 HR	N-ASD-A14	15.92	15.92	0
25 YR 72 HR	N-ASD-A15	16.41	16.41	0
25 YR 72 HR	N-ASD-A16	14.31	14.31	0
25 YR 72 HR	N-ASD-A17	16.62	16.62	0
25 YR 72 HR	N-ASD-A18	15.58	15.58	0
25 YR 72 HR	N-ASD-A19	14.93	14.93	0
25 YR 72 HR	N-ASD-B02	6.43	6.94	0.51
25 YR 72 HR	N-ASD-B03	7.84	7.64	-0.2
25 YR 72 HR	N-ASD-B04	8.09	8.05	-0.04
25 YR 72 HR	N-ASD-B05	8.8	8.48	-0.32
25 YR 72 HR	N-ASD-C03	8.95	8.96	0.01
25 YR 72 HR	N-ASD-C04	7.11	7.2	0.09
25 YR 72 HR	N-ASD-D04	8.96	8.93	-0.03
25 YR 72 HR	N-ASD-D05	9	9	0
25 YR 72 HR	N-ASD-D06	8.77	8.77	0
25 YR 72 HR	N-ASD-D07	9.07	9.07	0
25 YR 72 HR	N-ASD-E04	9.84	10.03	0.19
25 YR 72 HR	N-ASD-E05	10.78	10.89	0.11
25 YR 72 HR	N-ASD-E06	10.98	11.08	0.1
25 YR 72 HR	N-ASD-E09	14.21	14.21	0
25 YR 72 HR	N-ASD-E10	13.9	13.91	0.01
25 YR 72 HR	N-ASD-F03	9	8.88	-0.12
25 YR 72 HR	N-ASD-F04	9.28	9.16	-0.12
25 YR 72 HR	N-ASD-F05	9.69	9.64	-0.05
25 YR 72 HR	N-ASD-G04	9.35	9.58	0.23
25 YR 72 HR	N-ASD-H07	9.55	9.55	0
25 YR 72 HR	N-ASD-H08	9.55	9.55	0
25 YR 72 HR	N-ASD-I09	10.9	10.9	0
25 YR 72 HR	N-ASD-J10	12.54	12.54	0

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Area A Long Range Alternatives Existing Condition Tailwater
Unselected Alternative (2A) 25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 YR 72 HR	N-ASD-K10	13.9	13.9	0
25 YR 72 HR	N-ASD-L07	11.3	11.3	0
25 YR 72 HR	N-ASD-Q06	10.93	11.03	0.1
25 YR 72 HR	N-ASD-Q08	11.7	11.76	0.06
25 YR 72 HR	N-ASD-Q09	12.78	12.8	0.02
25 YR 72 HR	N-ASD-R13	14.25	14.25	0
25 YR 72 HR	N-ASD-S13	14.85	14.85	0
25 YR 72 HR	N-ASD-T15	16.56	16.56	0
25 YR 72 HR	N-ASD-U06	10.79	10.9	0.11
25 YR 72 HR	N-ASE-A01	6.11	6.36	0.25
25 YR 72 HR	N-ASE-A02	6.38	6.88	0.5
25 YR 72 HR	N-ASE-A03	9.1	7.57	-1.53
25 YR 72 HR	N-ASE-A04	9.11	7.59	-1.52
25 YR 72 HR	N-ASE-A05	11.45	11.45	0
25 YR 72 HR	N-ASE-B02	6.14	6.36	0.22
25 YR 72 HR	N-ASE-C03	7.04	8.12	1.08
25 YR 72 HR	N-ASE-D03	7.87	8.13	0.26
25 YR 72 HR	N-ASF-A01	6.47	5.68	-0.79
25 YR 72 HR	N-ASF-A02	6.47	5.69	-0.78
25 YR 72 HR	N-ASG-A01	5.93	5.74	-0.19
25 YR 72 HR	N-ASG-A02	6.27	5.79	-0.48
25 YR 72 HR	N-ASG-A03	6.8	5.81	-0.99
25 YR 72 HR	N-ASG-A04	7.46	5.85	-1.61
25 YR 72 HR	N-ASG-A05	7.46	5.86	-1.6
25 YR 72 HR	N-ASG-A06	7.13	7.13	0
25 YR 72 HR	N-ASG-B02	5.94	5.74	-0.2
25 YR 72 HR	N-ASG-B03x	5.94	5.74	-0.2
25 YR 72 HR	N-ASG-C04	6.54	5.83	-0.71
25 YR 72 HR	N-ASG-C05	6.45	5.84	-0.61
25 YR 72 HR	N-ASH-A01	5.94	5.72	-0.22
25 YR 72 HR	N-ASH-A02	5.94	5.73	-0.21
25 YR 72 HR	N-ASI-A01	5.47	5.54	0.07
25 YR 72 HR	N-ASJ	1.59	1.59	0
25 YR 72 HR	N-ASJ-A01	5.71	5.71	0
25 YR 72 HR	N-ASK-A01	5.55	5.7	0.15

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	9thSt-Node	#N/A	-1.23	#N/A
10 yr 1 hr	AltAdd-04-DSJ	#N/A	0.3	#N/A
10 yr 1 hr	B-Pump Node	#N/A	-6	#N/A
10 yr 1 hr	B-Pump Node 2	#N/A	-2.3	#N/A
10 yr 1 hr	N-BA	1.59	1.59	0
10 yr 1 hr	N-BA-A01	3.33	-1.77	-5.1
10 yr 1 hr	N-BA-A02	3.37	-0.61	-3.98
10 yr 1 hr	N-BA-A03	3.4	-0.23	-3.63
10 yr 1 hr	N-BA-A03x	3.37	0.77	-2.6
10 yr 1 hr	N-BA-A04	3.46	0.01	-3.45
10 yr 1 hr	N-BA-A04x	3.4	1.11	-2.29
10 yr 1 hr	N-BA-A05	3.46	0.12	-3.34
10 yr 1 hr	N-BA-A06	3.58	0.26	-3.32
10 yr 1 hr	N-BA-A07	3.65	0.51	-3.14
10 yr 1 hr	N-BA-A07x	3.61	0.72	-2.89
10 yr 1 hr	N-BA-A08	3.76	0.59	-3.17
10 yr 1 hr	N-BA-A08x	3.65	0.53	-3.12
10 yr 1 hr	N-BA-A09	3.91	3.81	-0.1
10 yr 1 hr	N-BA-B02	3.26	0.9	-2.36
10 yr 1 hr	N-BA-B03	3.26	1.08	-2.18
10 yr 1 hr	N-BA-B04	3.25	1.14	-2.11
10 yr 1 hr	N-BA-C03	3.33	1.4	-1.93
10 yr 1 hr	N-BA-C04	3.32	-2.3	-5.62
10 yr 1 hr	N-BA-D05	3.48	0.01	-3.47
10 yr 1 hr	N-BA-D06	3.49	0.91	-2.58
10 yr 1 hr	N-BA-D07	3.65	1.16	-2.49
10 yr 1 hr	N-BA-D08	3.72	1.17	-2.55
10 yr 1 hr	N-BA-E09	3.76	0.76	-3
10 yr 1 hr	N-BA-F09	3.87	2.18	-1.69
10 yr 1 hr	N-BA-K04	3.39	1.88	-1.51
10 yr 1 hr	N-BA-K05	3.41	2.5	-0.91
10 yr 1 hr	N-BA-K06	3.6	2.87	-0.73
10 yr 1 hr	N-BA-K08	5.06	5.04	-0.02
10 yr 1 hr	N-BA-L06	3.54	2.16	-1.38
10 yr 1 hr	N-BA-Q05	3.38	-1.27	-4.65
10 yr 1 hr	N-BA-Q06	3.38	-1.27	-4.65
10 yr 1 hr	N-BA-Q06x	3.38	-1.28	-4.66
10 yr 1 hr	N-BA-Q07	3.38	-1.27	-4.65
10 yr 1 hr	N-BA-Q07x	3.37	-1.24	-4.61
10 yr 1 hr	N-BA-Q08	3.39	-0.3	-3.69
10 yr 1 hr	N-BA-R06	3.39	-1.26	-4.65
10 yr 1 hr	N-BA-R07	3.38	-1.26	-4.64
10 yr 1 hr	N-BA-R07x	3.4	-0.06	-3.46
10 yr 1 hr	N-BA-R08	3.38	-1.28	-4.66

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA-R08x	3.39	-1.12	-4.51
10 yr 1 hr	N-BA-R09	3.38	-1.23	-4.61
10 yr 1 hr	N-BA-R10	3.38	-0.2	-3.58
10 yr 1 hr	N-BA-R11	3.37	-0.19	-3.56
10 yr 1 hr	N-BA-S06a	3.68	2.57	-1.11
10 yr 1 hr	N-BA-T07	3.69	0.64	-3.05
10 yr 1 hr	N-BA-T08	3.68	0.62	-3.06
10 yr 1 hr	N-BA-T08x	3.69	0.68	-3.01
10 yr 1 hr	N-BA-T09	3.4	0.62	-2.78
10 yr 1 hr	N-BA-T09x	3.68	0.63	-3.05
10 yr 1 hr	N-BA-T10	3.4	0.62	-2.78
10 yr 1 hr	N-BA-U02	3.32	0.02	-3.3
10 yr 1 hr	N-BA-U03	3.33	0.03	-3.3
10 yr 1 hr	N-BA-V07	3.75	3.71	-0.04
10 yr 1 hr	N-BA-W08	4.19	3.43	-0.76
10 yr 1 hr	N-BA-W09A	4.2	3.34	-0.86
10 yr 1 hr	N-BA-W09B	4.17	3.2	-0.97
10 yr 1 hr	N-BB	1.59	1.59	0
10 yr 1 hr	N-BB-A01	3.32	-0.86	-4.18
10 yr 1 hr	N-BB-A02	3.33	-0.88	-4.21
10 yr 1 hr	N-BB-A03	3.31	-0.35	-3.66
10 yr 1 hr	N-BB-A04	3.32	-0.34	-3.66
10 yr 1 hr	N-BC	1.59	1.59	0
10 yr 1 hr	N-BC-A01	2.39	2.19	-0.2
10 yr 1 hr	N-BC-A02	4.78	2.64	-2.14
10 yr 1 hr	N-BD	1.59	1.59	0
10 yr 1 hr	N-BD-A01	3.33	-2.86	-6.19
10 yr 1 hr	N-BD-A02	3.36	-1.37	-4.73
10 yr 1 hr	N-BD-A02x	3.37	-0.51	-3.88
10 yr 1 hr	N-BD-A03	3.37	-1.31	-4.68
10 yr 1 hr	N-BD-A05	3.37	-1.25	-4.62
10 yr 1 hr	N-BD-B02	3.33	-1.9	-5.23
10 yr 1 hr	N-BD-B03	3.32	-1.36	-4.68
10 yr 1 hr	N-BD-B04	3.32	2.41	-0.91
10 yr 1 hr	N-BD-B04x	3.32	-1.22	-4.54
10 yr 1 hr	N-BE	1.59	1.59	0
10 yr 1 hr	N-BE-A01	3.31	3.03	-0.28
10 yr 1 hr	N-BE-A03	3.39	-1.24	-4.63
10 yr 1 hr	N-BE-A04	3.4	0.68	-2.72
10 yr 1 hr	N-BF	1.59	1.59	0
10 yr 1 hr	N-BF-A01	3.9	3.76	-0.14
10 yr 1 hr	N-BG	#N/A	1.59	#N/A
10 yr 1 hr	N-CA	1.59	1.59	0
10 yr 1 hr	N-CA-A01c	5.81	5.09	-0.72

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Area BCDE Long Range Alternative Selected Alternative with Existing Conditions Tailwater(2BC,3D,1E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-A01d	3.23	-4.07	-7.3
10 yr 1 hr	N-CA-A02	3.35	-2.95	-6.3
10 yr 1 hr	N-CA-A03	3.37	-2.1	-5.47
10 yr 1 hr	N-CA-A04	3.4	-0.08	-3.48
10 yr 1 hr	N-CA-A05	3.41	1.44	-1.97
10 yr 1 hr	N-CA-A07	4.72	4.8	0.08
10 yr 1 hr	N-CA-B03	3.36	1.44	-1.92
10 yr 1 hr	N-CA-B04	3.38	1.44	-1.94
10 yr 1 hr	N-CA-B07	4.35	3.61	-0.74
10 yr 1 hr	N-CA-C03	3.13	-1.72	-4.85
10 yr 1 hr	N-CA-C04	3.11	-1.72	-4.83
10 yr 1 hr	N-CA-C05	3.14	2.65	-0.49
10 yr 1 hr	N-CA-D06	3.62	3.56	-0.06
10 yr 1 hr	N-CA-D07	3.62	1.52	-2.1
10 yr 1 hr	N-CA-D07x	3.79	3.79	0
10 yr 1 hr	N-CA-D08	3.13	-0.51	-3.64
10 yr 1 hr	N-CA-D08x	3.64	1.55	-2.09
10 yr 1 hr	N-CA-D09x	3.13	-0.43	-3.56
10 yr 1 hr	N-CA-E07	4.42	3.74	-0.68
10 yr 1 hr	N-CA-E08	4.43	3.75	-0.68
10 yr 1 hr	N-CA-E09x	4.57	3.77	-0.8
10 yr 1 hr	N-CA-F04	3.37	-3	-6.37
10 yr 1 hr	N-CA-F05	3.09	-1.01	-4.1
10 yr 1 hr	N-CA-F05x	3.19	-3.01	-6.2
10 yr 1 hr	N-CA-F06	3.08	-2.16	-5.24
10 yr 1 hr	N-CA-F06x	3.07	-0.99	-4.06
10 yr 1 hr	N-CA-F07	3.08	-2.2	-5.28
10 yr 1 hr	N-CA-F07x	3.07	-1.46	-4.53
10 yr 1 hr	N-CA-F08	3.09	-1.69	-4.78
10 yr 1 hr	N-CA-F09	3.09	-0.56	-3.65
10 yr 1 hr	N-CA-F09x	3.09	-1.28	-4.37
10 yr 1 hr	N-CA-F10	3.1	-0.28	-3.38
10 yr 1 hr	N-CA-F11	3.1	-0.21	-3.31
10 yr 1 hr	N-CA-F11x	3.09	-0.22	-3.31
10 yr 1 hr	N-CA-F12	3.1	-0.21	-3.31
10 yr 1 hr	N-CA-F12x	3.1	0.99	-2.11
10 yr 1 hr	N-CA-G08	3.1	-0.69	-3.79
10 yr 1 hr	N-CA-G09	3.1	-0.65	-3.75
10 yr 1 hr	N-CA-G10	3.39	-0.63	-4.02
10 yr 1 hr	N-CA-G11x	3.37	0.11	-3.26
10 yr 1 hr	N-CA-H09	3.1	-1.1	-4.2
10 yr 1 hr	N-CA-H10	3.1	-0.9	-4
10 yr 1 hr	N-CA-H10x	3.1	-0.3	-3.4
10 yr 1 hr	N-CA-H11	3.12	-0.55	-3.67

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Area BCDE Long Range Alternative Selected Alternative with Existing Conditions Tailwater(2BC,3D,1E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-H11x	3.1	-0.67	-3.77
10 yr 1 hr	N-CA-H12	3.12	-0.53	-3.65
10 yr 1 hr	N-CA-H13	3.24	1.03	-2.21
10 yr 1 hr	N-CA-H14	3.32	1.08	-2.24
10 yr 1 hr	N-CA-I12	3.12	0.66	-2.46
10 yr 1 hr	N-CA-I13	3.12	1.03	-2.09
10 yr 1 hr	N-CA-I14	3.12	1.54	-1.58
10 yr 1 hr	N-CA-J14	3.26	1.92	-1.34
10 yr 1 hr	N-CA-J15x	3.3	1.96	-1.34
10 yr 1 hr	N-CA-K03	3.36	0.6	-2.76
10 yr 1 hr	N-CA-L04	3.38	0.8	-2.58
10 yr 1 hr	N-CA-L05	3.52	1.21	-2.31
10 yr 1 hr	N-CA-M06	3.55	0.89	-2.66
10 yr 1 hr	N-CA-N05	3.57	2.45	-1.12
10 yr 1 hr	N-CA-O08	4.93	4.81	-0.12
10 yr 1 hr	N-CA-S05	3.23	0.01	-3.22
10 yr 1 hr	N-CA-T08	3.06	-1.24	-4.3
10 yr 1 hr	N-CA-T09	3.06	-1.23	-4.29
10 yr 1 hr	N-CB	1.59	1.59	0
10 yr 1 hr	N-CB-A01	3	-4.32	-7.32
10 yr 1 hr	N-CB-A02	#N/A	-3.66	#N/A
10 yr 1 hr	N-CB-Added	#N/A	-5.32	#N/A
10 yr 1 hr	N-CC	1.59	1.59	0
10 yr 1 hr	N-CC-A01	2.81	-1.77	-4.58
10 yr 1 hr	N-CC-A02	2.84	-1.77	-4.61
10 yr 1 hr	N-CC-A03	3.06	-1.82	-4.88
10 yr 1 hr	N-CE	1.59	1.59	0
10 yr 1 hr	N-CE-A01	3.1	2.3	-0.8
10 yr 1 hr	N-CE-A02	3.1	2.28	-0.82
10 yr 1 hr	N-CE-A03	3.1	2.26	-0.84
10 yr 1 hr	N-CF	1.59	1.59	0
10 yr 1 hr	N-CF-A01	3.12	1.89	-1.23
10 yr 1 hr	N-CF-A02	3.12	1.88	-1.24
10 yr 1 hr	N-CF-A03x	3.12	1.91	-1.21
10 yr 1 hr	N-CG	1.59	1.59	0
10 yr 1 hr	N-CG-A01	3.12	1.91	-1.21
10 yr 1 hr	N-CG-A02x	3.12	1.91	-1.21
10 yr 1 hr	N-CG-A03x	3.26	2.09	-1.17
10 yr 1 hr	N-CH	1.59	1.59	0
10 yr 1 hr	N-CH-A01b	1.81	-1.8	-3.61
10 yr 1 hr	N-CH-A02	2.23	-1.6	-3.83
10 yr 1 hr	N-CH-A03	3.64	-0.68	-4.32
10 yr 1 hr	N-CH-A04	3.76	-0.63	-4.39
10 yr 1 hr	N-CH-Added	#N/A	-1.82	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CH-B02	2.87	-0.21	-3.08
10 yr 1 hr	N-CH-B03	3.84	1.95	-1.89
10 yr 1 hr	N-CH-B03x	2.89	-0.19	-3.08
10 yr 1 hr	N-CH-B04	3.91	2.75	-1.16
10 yr 1 hr	N-CH-B04x	4.04	2.18	-1.86
10 yr 1 hr	N-CH-B05	4.72	3.15	-1.57
10 yr 1 hr	N-CH-B05x	3.99	2.78	-1.21
10 yr 1 hr	N-CH-B06	4.88	4.73	-0.15
10 yr 1 hr	N-CH-B06x	4.82	3.54	-1.28
10 yr 1 hr	N-CH-B07	5.89	5.84	-0.05
10 yr 1 hr	N-CH-C04	3.75	-0.15	-3.9
10 yr 1 hr	N-CH-C05	3.77	0.04	-3.73
10 yr 1 hr	N-CH-C05x1	3.77	-0.11	-3.88
10 yr 1 hr	N-CH-C05x2	3.77	-0.15	-3.92
10 yr 1 hr	N-CH-C05x3	3.77	-0.14	-3.91
10 yr 1 hr	N-CH-C06	3.78	0.09	-3.69
10 yr 1 hr	N-CH-C06x	3.77	0.05	-3.72
10 yr 1 hr	N-CH-C07x	3.77	0.15	-3.62
10 yr 1 hr	N-CH-D05	3.77	-0.09	-3.86
10 yr 1 hr	N-CH-D06	3.77	0.12	-3.65
10 yr 1 hr	N-CH-D08x	3.77	0.35	-3.42
10 yr 1 hr	N-CH-E06	3.78	0.13	-3.65
10 yr 1 hr	N-CH-E07	3.78	0.14	-3.64
10 yr 1 hr	N-CH-F07	3.78	0.2	-3.58
10 yr 1 hr	N-CH-F08	3.78	0.22	-3.56
10 yr 1 hr	N-CH-G07	3.77	0.2	-3.57
10 yr 1 hr	N-CH-G08	3.77	0.34	-3.43
10 yr 1 hr	N-CH-G09	3.77	0.37	-3.4
10 yr 1 hr	N-CH-G10	3.77	0.45	-3.32
10 yr 1 hr	N-CH-G11	3.77	0.46	-3.31
10 yr 1 hr	N-CH-I04	3.73	0.35	-3.38
10 yr 1 hr	N-CH-I05x1	3.76	0.37	-3.39
10 yr 1 hr	N-CH-I05x2	3.76	0.94	-2.82
10 yr 1 hr	N-CH-I05x3	3.76	1.05	-2.71
10 yr 1 hr	N-CH-I05x4	3.76	0.36	-3.4
10 yr 1 hr	N-CI	1.59	1.59	0
10 yr 1 hr	N-D10	3.77	0.37	-3.4
10 yr 1 hr	N-D16	2.53	3.38	0.85
10 yr 1 hr	N-D19	4.78	4.67	-0.11
10 yr 1 hr	N-D20	4.77	4.44	-0.33
10 yr 1 hr	N-D22	4.79	4.75	-0.04
10 yr 1 hr	N-D30	4.76	4.23	-0.53
10 yr 1 hr	N-DA	1.59	1.59	0
10 yr 1 hr	N-DA-A01	3.36	-0.76	-4.12

Area BCDE Long Range Alternative Selected Alternative with Existing Conditions Tailwater(2BC,3D,1E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DB	1.59	1.59	0
10 yr 1 hr	N-DC	1.59	1.59	0
10 yr 1 hr	N-DI-A01	3.51	-1.38	-4.89
10 yr 1 hr	N-DI-A02	3.52	-0.69	-4.21
10 yr 1 hr	N-DI-B04	4.27	0.71	-3.56
10 yr 1 hr	N-DI-B05	4.03	0.84	-3.19
10 yr 1 hr	N-DI-B05x	4.71	0.71	-4
10 yr 1 hr	N-DI-B06	4.04	0.97	-3.07
10 yr 1 hr	N-DI-B07	4.72	1.09	-3.63
10 yr 1 hr	N-DI-B08	4.72	1.47	-3.25
10 yr 1 hr	N-DI-B09	4.73	1.78	-2.95
10 yr 1 hr	N-DI-B10	4.75	2.61	-2.14
10 yr 1 hr	N-DI-B10x	4.73	1.83	-2.9
10 yr 1 hr	N-DI-B11	4.74	2.62	-2.12
10 yr 1 hr	N-DI-C03	3.55	-0.11	-3.66
10 yr 1 hr	N-DI-C04	4.78	4.51	-0.27
10 yr 1 hr	N-DI-C05	4.52	2.97	-1.55
10 yr 1 hr	N-DP	4.17	0.72	-3.45
10 yr 1 hr	N-DP-A01	4.32	1.2	-3.12
10 yr 1 hr	N-DP-A02	4.36	1.58	-2.78
10 yr 1 hr	N-DP-A04	4.39	3.1	-1.29
10 yr 1 hr	N-DP-A07	4.77	3.04	-1.73
10 yr 1 hr	N-DP-A08	4.77	3.04	-1.73
10 yr 1 hr	N-DP-A09	4.77	2.81	-1.96
10 yr 1 hr	N-DP-A09x	4.77	3.05	-1.72
10 yr 1 hr	N-DP-A10	4.76	2.86	-1.9
10 yr 1 hr	N-DP-A11x	4.76	2.87	-1.89
10 yr 1 hr	N-DP-B2	4.35	1.42	-2.93
10 yr 1 hr	N-DP-C02	4.37	1.89	-2.48
10 yr 1 hr	N-DP-C03	3.36	1.06	-2.3
10 yr 1 hr	N-DP-C03x	4.37	1.9	-2.47
10 yr 1 hr	N-DP-D02	4.43	2.63	-1.8
10 yr 1 hr	N-DP-D03x	4.82	4.72	-0.1
10 yr 1 hr	N-DP-D04	4.59	3.2	-1.39
10 yr 1 hr	N-DP-D05x	4.64	3.48	-1.16
10 yr 1 hr	N-DP-D06x	4.71	3.68	-1.03
10 yr 1 hr	N-DP-D07x	4.81	3.94	-0.87
10 yr 1 hr	N-DP-D08x	4.89	4.1	-0.79
10 yr 1 hr	N-DP-D09	5.01	4.34	-0.67
10 yr 1 hr	N-DP-D10	5.4	5.34	-0.06
10 yr 1 hr	N-DP-E05	4.74	4.11	-0.63
10 yr 1 hr	N-DP-E06	4.86	4.85	-0.01
10 yr 1 hr	N-DP-E08	4.78	4.65	-0.13
10 yr 1 hr	N-DP-F07	5.1	5.01	-0.09

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DP-F08	4.94	4.62	-0.32
10 yr 1 hr	N-DP-F09	4.96	4.95	-0.01
10 yr 1 hr	N-DP-G05	4.36	3.4	-0.96
10 yr 1 hr	N-DP-G06	4.36	-0.5	-4.86
10 yr 1 hr	N-DP-G07	4.36	-0.05	-4.41
10 yr 1 hr	N-DP-G07x	4.35	-0.5	-4.85
10 yr 1 hr	N-DP-G08	4.39	0.83	-3.56
10 yr 1 hr	N-DP-G08x	4.36	-0.05	-4.41
10 yr 1 hr	N-DP-H04	4.36	1.6	-2.76
10 yr 1 hr	N-DP-H05	4.36	1.63	-2.73
10 yr 1 hr	N-DP-H05x	4.36	3.79	-0.57
10 yr 1 hr	N-DP-H06	4.35	-0.63	-4.98
10 yr 1 hr	N-DP-H06x	4.36	4.05	-0.31
10 yr 1 hr	N-DP-K07	4.36	-0.44	-4.8
10 yr 1 hr	N-DP-M10	5.11	1.8	-3.31
10 yr 1 hr	N-DP-M11	5.2	1.73	-3.47
10 yr 1 hr	N-DP-M12	5.25	5.13	-0.12
10 yr 1 hr	N-DP-N10	4.89	4.17	-0.72
10 yr 1 hr	N-DP-O10	4.77	2.98	-1.79
10 yr 1 hr	N-DP-O11	4.88	3.18	-1.7
10 yr 1 hr	N-DP-P06	4.6	4.32	-0.28
10 yr 1 hr	N-DP-Y03	5.11	5.11	0
10 yr 1 hr	N-DP-Z12	4.26	4.09	-0.17
10 yr 1 hr	N-DQ-A01	4.33	-1.83	-6.16
10 yr 1 hr	N-DQ-A01x	#N/A	-1.61	#N/A
10 yr 1 hr	N-DQ-A02	4.34	3.11	-1.23
10 yr 1 hr	N-DQ-A03	4.33	-2.11	-6.44
10 yr 1 hr	N-DQ-A03x	2.94	-2.76	-5.7
10 yr 1 hr	N-DQ-A04	5.32	5.32	0
10 yr 1 hr	N-DQ-A05	4.03	-2.59	-6.62
10 yr 1 hr	N-DQ-A06	4.33	3.36	-0.97
10 yr 1 hr	N-DQ-A07	4.33	3.4	-0.93
10 yr 1 hr	N-DQ-A08	4.33	3.45	-0.88
10 yr 1 hr	N-E01	2.9	2.89	-0.01
10 yr 1 hr	N-E02	3.35	3.36	0.01
10 yr 1 hr	N-E03	4	4	0
10 yr 1 hr	N-E07	4.49	4.49	0
10 yr 1 hr	N-E08	3.78	3.78	0
10 yr 1 hr	N-E10	3.71	3.71	0
10 yr 1 hr	N-E11	1.83	2.18	0.35
10 yr 1 hr	N-EA	1.59	1.59	0
10 yr 1 hr	N-EA-A01	3.81	1.07	-2.74
10 yr 1 hr	N-EA-A02	3.81	1.89	-1.92
10 yr 1 hr	N-EB	1.59	1.59	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-EB-A01	2.52	2	-0.52
10 yr 1 hr	N-EC	1.59	1.59	0
10 yr 1 hr	N-EC-A01	2.69	2.14	-0.55
10 yr 1 hr	N-ED	1.59	1.59	0
10 yr 1 hr	N-ED-A01	3.24	1.4	-1.84
10 yr 1 hr	N-ED-A02	3.41	1.16	-2.25
10 yr 1 hr	N-ED-A03	3.51	1.49	-2.02
10 yr 1 hr	N-EE	1.59	1.59	0
10 yr 1 hr	N-EE-A01	3.66	1.21	-2.45
10 yr 1 hr	N-EF	1.59	1.59	0
10 yr 1 hr	N-EF-A01	3.11	2.99	-0.12
10 yr 1 hr	N-EG	1.59	1.59	0
10 yr 1 hr	N-EG-A01	3.43	2.05	-1.38
10 yr 1 hr	N-EG-A02	3.62	1.1	-2.52
10 yr 1 hr	N-EH	1.59	1.59	0
10 yr 1 hr	N-EH-A01	1.77	0.79	-0.98
10 yr 1 hr	N-EI	1.59	1.59	0
10 yr 1 hr	N-EJ	1.59	1.59	0
10 yr 1 hr	N-EJ-A01	1.61	1.61	0
10 yr 1 hr	N-EK	1.59	1.59	0
10 yr 1 hr	N-EK-A01	3.68	3.68	0
10 yr 1 hr	N-EL	1.59	1.59	0
10 yr 1 hr	N-EL-A01	3.01	2.99	-0.02
10 yr 1 hr	N-EM	1.59	1.59	0
10 yr 1 hr	N-EM-A01	2.63	2.95	0.32
10 yr 1 hr	N-EM-A02	2.61	2.92	0.31
10 yr 1 hr	N-EM-A03	2	2.02	0.02
10 yr 1 hr	N-EN	1.59	1.59	0
10 yr 1 hr	N-EN-A01	2.83	2.54	-0.29
10 yr 1 hr	N-EO	1.59	1.59	0
10 yr 1 hr	N-EO-A01	2.22	2.77	0.55
10 yr 1 hr	N-EP	1.59	1.59	0
10 yr 1 hr	N-EP-A01	1.98	2.01	0.03
10 yr 1 hr	N-EQ	1.59	1.59	0
10 yr 1 hr	N-EQ-A01	1.65	1.65	0
10 yr 1 hr	N-ER	1.59	1.59	0
10 yr 1 hr	N-ES	1.59	1.59	0
10 yr 1 hr	N-ET	1.59	1.59	0
10 yr 1 hr	N-ET-A01	1.59	3.37	1.78
10 yr 1 hr	N-P-B-A01-DSJ	#N/A	-9.99	#N/A

Kimley»Horn

Area BCDE Long Range Alternative Selected Alternative with Existing Conditions Tailwater(2BC,3D,1E)10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-P-BE-A02-DSJ	#N/A	-2.3	#N/A
10 yr 1 hr	N-Pump-C3	#N/A	-1.22	#N/A
10 yr 1 hr	NAltAdd_01	#N/A	0.93	#N/A
10 yr 1 hr	P-CG-A01-DSJ	#N/A	1.91	#N/A
10 yr 1 hr	P-DA-A01-DSJ	#N/A	-2.08	#N/A
10 yr 1 hr	P-DI-A01-DSJ	#N/A	-2.08	#N/A
10 yr 1 hr	P-DQ-A01 DSJ	#N/A	-4.57	#N/A
10 yr 1 hr	P-EA-A01-DSJ	#N/A	0.3	#N/A
10 yr 1 hr	P-EL-A01-DSJ	#N/A	1.5	#N/A
10 yr 1 hr	P-EM-A01-DSJ	#N/A	2.95	#N/A
10 yr 1 hr	P-EN-A01-DSJ	#N/A	1.8	#N/A
10 yr 1 hr	P-EO-A01-DSJ	#N/A	2	#N/A
10 yr 1 hr	P-EP-A01-DSJ	#N/A	2	#N/A
10 yr 1 hr	Trunkline-Junction-1	#N/A	0.42	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	9thSt-Node	#N/A	1.17	#N/A
25 yr 72 hr	AltAdd-04-DSJ	#N/A	0.3	#N/A
25 yr 72 hr	B-Pump Node	#N/A	-6	#N/A
25 yr 72 hr	B-Pump Node 2	#N/A	0.58	#N/A
25 yr 72 hr	N-BA	1.59	1.59	0
25 yr 72 hr	N-BA-A01	3.55	1.11	-2.44
25 yr 72 hr	N-BA-A02	3.6	1.67	-1.93
25 yr 72 hr	N-BA-A03	3.64	2.08	-1.56
25 yr 72 hr	N-BA-A03x	3.6	1.67	-1.93
25 yr 72 hr	N-BA-A04	3.71	2.46	-1.25
25 yr 72 hr	N-BA-A04x	3.63	2.08	-1.55
25 yr 72 hr	N-BA-A05	3.72	2.67	-1.05
25 yr 72 hr	N-BA-A06	3.78	2.82	-0.96
25 yr 72 hr	N-BA-A07	3.82	2.99	-0.83
25 yr 72 hr	N-BA-A07x	3.81	2.82	-0.99
25 yr 72 hr	N-BA-A08	3.83	3.01	-0.82
25 yr 72 hr	N-BA-A08x	3.82	3.19	-0.63
25 yr 72 hr	N-BA-A09	4.01	4.3	0.29
25 yr 72 hr	N-BA-B02	3.41	1.26	-2.15
25 yr 72 hr	N-BA-B03	3.41	1.29	-2.12
25 yr 72 hr	N-BA-B04	3.39	1.33	-2.06
25 yr 72 hr	N-BA-C03	3.57	1.56	-2.01
25 yr 72 hr	N-BA-C04	3.57	-2.3	-5.87
25 yr 72 hr	N-BA-D05	3.73	2.5	-1.23
25 yr 72 hr	N-BA-D06	3.75	2.91	-0.84
25 yr 72 hr	N-BA-D07	3.85	3.36	-0.49
25 yr 72 hr	N-BA-D08	3.89	3.38	-0.51
25 yr 72 hr	N-BA-E09	3.83	3.09	-0.74
25 yr 72 hr	N-BA-F09	3.88	3.04	-0.84
25 yr 72 hr	N-BA-K04	3.69	3.02	-0.67
25 yr 72 hr	N-BA-K05	3.72	3.44	-0.28
25 yr 72 hr	N-BA-K06	3.78	3.73	-0.05
25 yr 72 hr	N-BA-K08	5.08	5.08	0
25 yr 72 hr	N-BA-L06	3.76	3.63	-0.13
25 yr 72 hr	N-BA-Q05	3.67	1.31	-2.36
25 yr 72 hr	N-BA-Q06	3.66	1.38	-2.28
25 yr 72 hr	N-BA-Q06x	3.67	1.18	-2.49
25 yr 72 hr	N-BA-Q07	3.68	1.49	-2.19
25 yr 72 hr	N-BA-Q07x	3.66	1.39	-2.27
25 yr 72 hr	N-BA-Q08	3.68	1.49	-2.19
25 yr 72 hr	N-BA-R06	3.69	2.75	-0.94
25 yr 72 hr	N-BA-R07	3.68	1.59	-2.09
25 yr 72 hr	N-BA-R07x	3.7	3.15	-0.55
25 yr 72 hr	N-BA-R08	3.66	0.77	-2.89

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA-R08x	3.68	1.6	-2.08
25 yr 72 hr	N-BA-R09	3.67	0.8	-2.87
25 yr 72 hr	N-BA-R10	3.67	0.81	-2.86
25 yr 72 hr	N-BA-R11	3.65	0.81	-2.84
25 yr 72 hr	N-BA-S06a	3.94	3.82	-0.12
25 yr 72 hr	N-BA-T07	3.73	3.02	-0.71
25 yr 72 hr	N-BA-T08	3.72	3.02	-0.7
25 yr 72 hr	N-BA-T08x	3.73	3.02	-0.71
25 yr 72 hr	N-BA-T09	3.69	3.02	-0.67
25 yr 72 hr	N-BA-T09x	3.71	3.02	-0.69
25 yr 72 hr	N-BA-T10	3.69	3.02	-0.67
25 yr 72 hr	N-BA-U02	3.55	1.56	-1.99
25 yr 72 hr	N-BA-U03	3.56	1.66	-1.9
25 yr 72 hr	N-BA-V07	3.8	3.78	-0.02
25 yr 72 hr	N-BA-W08	4.54	4.5	-0.04
25 yr 72 hr	N-BA-W09A	4.55	4.51	-0.04
25 yr 72 hr	N-BA-W09B	4.51	4.47	-0.04
25 yr 72 hr	N-BB	1.59	1.59	0
25 yr 72 hr	N-BB-A01	3.6	0.62	-2.98
25 yr 72 hr	N-BB-A02	3.59	0.73	-2.86
25 yr 72 hr	N-BB-A03	3.57	0.75	-2.82
25 yr 72 hr	N-BB-A04	3.58	0.75	-2.83
25 yr 72 hr	N-BC	1.59	1.59	0
25 yr 72 hr	N-BC-A01	2.54	2.25	-0.29
25 yr 72 hr	N-BC-A02	4.82	2.77	-2.05
25 yr 72 hr	N-BD	1.59	1.59	0
25 yr 72 hr	N-BD-A01	3.59	-0.75	-4.34
25 yr 72 hr	N-BD-A02	3.64	0.69	-2.95
25 yr 72 hr	N-BD-A02x	3.65	0.7	-2.95
25 yr 72 hr	N-BD-A03	3.65	0.86	-2.79
25 yr 72 hr	N-BD-A05	3.64	1.18	-2.46
25 yr 72 hr	N-BD-B02	3.59	-0.72	-4.31
25 yr 72 hr	N-BD-B03	3.57	-0.37	-3.94
25 yr 72 hr	N-BD-B04	3.64	2.61	-1.03
25 yr 72 hr	N-BD-B04x	3.57	1.16	-2.41
25 yr 72 hr	N-BE	1.59	1.59	0
25 yr 72 hr	N-BE-A01	3.56	3.03	-0.53
25 yr 72 hr	N-BE-A03	3.68	-1.19	-4.87
25 yr 72 hr	N-BE-A04	3.68	0.73	-2.95
25 yr 72 hr	N-BF	1.59	1.59	0
25 yr 72 hr	N-BF-A01	4.06	3.93	-0.13
25 yr 72 hr	N-BG	#N/A	1.59	#N/A
25 yr 72 hr	N-CA	1.59	1.59	0
25 yr 72 hr	N-CA-A01c	5.81	5.09	-0.72

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-A01d	3.45	1.53	-1.92
25 yr 72 hr	N-CA-A02	3.58	2.65	-0.93
25 yr 72 hr	N-CA-A03	3.59	2.78	-0.81
25 yr 72 hr	N-CA-A04	3.6	3.08	-0.52
25 yr 72 hr	N-CA-A05	3.6	3.29	-0.31
25 yr 72 hr	N-CA-A07	5.04	5.17	0.13
25 yr 72 hr	N-CA-B03	3.59	2.89	-0.7
25 yr 72 hr	N-CA-B04	3.6	3.11	-0.49
25 yr 72 hr	N-CA-B07	4.7	4.55	-0.15
25 yr 72 hr	N-CA-C03	3.38	-0.08	-3.46
25 yr 72 hr	N-CA-C04	3.35	-0.08	-3.43
25 yr 72 hr	N-CA-C05	3.39	2.67	-0.72
25 yr 72 hr	N-CA-D06	3.64	3.59	-0.05
25 yr 72 hr	N-CA-D07	3.65	2.66	-0.99
25 yr 72 hr	N-CA-D07x	3.81	3.81	0
25 yr 72 hr	N-CA-D08	3.4	2.19	-1.21
25 yr 72 hr	N-CA-D08x	3.66	2.69	-0.97
25 yr 72 hr	N-CA-D09x	3.4	2.21	-1.19
25 yr 72 hr	N-CA-E07	4.8	4.57	-0.23
25 yr 72 hr	N-CA-E08	4.82	4.57	-0.25
25 yr 72 hr	N-CA-E09x	5.03	4.57	-0.46
25 yr 72 hr	N-CA-F04	3.56	0.51	-3.05
25 yr 72 hr	N-CA-F05	3.36	0.56	-2.8
25 yr 72 hr	N-CA-F05x	3.43	0.5	-2.93
25 yr 72 hr	N-CA-F06	3.35	0.51	-2.84
25 yr 72 hr	N-CA-F06x	3.33	0.58	-2.75
25 yr 72 hr	N-CA-F07	3.34	1.15	-2.19
25 yr 72 hr	N-CA-F07x	3.33	0.54	-2.79
25 yr 72 hr	N-CA-F08	3.36	1.52	-1.84
25 yr 72 hr	N-CA-F09	3.36	1.67	-1.69
25 yr 72 hr	N-CA-F09x	3.36	1.52	-1.84
25 yr 72 hr	N-CA-F10	3.37	1.85	-1.52
25 yr 72 hr	N-CA-F11	3.37	1.92	-1.45
25 yr 72 hr	N-CA-F11x	3.37	1.89	-1.48
25 yr 72 hr	N-CA-F12	3.37	1.93	-1.44
25 yr 72 hr	N-CA-F12x	3.37	1.95	-1.42
25 yr 72 hr	N-CA-G08	3.37	1.54	-1.83
25 yr 72 hr	N-CA-G09	3.38	1.6	-1.78
25 yr 72 hr	N-CA-G10	3.58	1.62	-1.96
25 yr 72 hr	N-CA-G11x	3.56	1.63	-1.93
25 yr 72 hr	N-CA-H09	3.38	1.86	-1.52
25 yr 72 hr	N-CA-H10	3.38	1.96	-1.42
25 yr 72 hr	N-CA-H10x	3.37	1.94	-1.43
25 yr 72 hr	N-CA-H11	3.39	2.12	-1.27

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-H11x	3.38	2.11	-1.27
25 yr 72 hr	N-CA-H12	3.39	2.13	-1.26
25 yr 72 hr	N-CA-H13	3.4	2.18	-1.22
25 yr 72 hr	N-CA-H14	3.41	2.23	-1.18
25 yr 72 hr	N-CA-I12	3.39	2.14	-1.25
25 yr 72 hr	N-CA-I13	3.39	2.15	-1.24
25 yr 72 hr	N-CA-I14	3.39	2.15	-1.24
25 yr 72 hr	N-CA-J14	3.4	2.19	-1.21
25 yr 72 hr	N-CA-J15x	3.4	2.23	-1.17
25 yr 72 hr	N-CA-K03	3.62	2.71	-0.91
25 yr 72 hr	N-CA-L04	3.6	3.13	-0.47
25 yr 72 hr	N-CA-L05	3.73	3.59	-0.14
25 yr 72 hr	N-CA-M06	3.77	3.58	-0.19
25 yr 72 hr	N-CA-N05	3.66	3.54	-0.12
25 yr 72 hr	N-CA-O08	4.98	5.01	0.03
25 yr 72 hr	N-CA-S05	3.41	0.53	-2.88
25 yr 72 hr	N-CA-T08	3.32	1.18	-2.14
25 yr 72 hr	N-CA-T09	3.32	1.18	-2.14
25 yr 72 hr	N-CB	1.59	1.59	0
25 yr 72 hr	N-CB-A01	3.19	-0.73	-3.92
25 yr 72 hr	N-CB-A02	#N/A	-0.09	#N/A
25 yr 72 hr	N-CB-Added	#N/A	-1.17	#N/A
25 yr 72 hr	N-CC	1.59	1.59	0
25 yr 72 hr	N-CC-A01	3.15	-0.07	-3.22
25 yr 72 hr	N-CC-A02	3.18	-0.08	-3.26
25 yr 72 hr	N-CC-A03	3.31	-0.08	-3.39
25 yr 72 hr	N-CE	1.59	1.59	0
25 yr 72 hr	N-CE-A01	3.37	2.39	-0.98
25 yr 72 hr	N-CE-A02	3.37	2.36	-1.01
25 yr 72 hr	N-CE-A03	3.37	2.36	-1.01
25 yr 72 hr	N-CF	1.59	1.59	0
25 yr 72 hr	N-CF-A01	3.38	2.15	-1.23
25 yr 72 hr	N-CF-A02	3.38	2.15	-1.23
25 yr 72 hr	N-CF-A03x	3.38	2.17	-1.21
25 yr 72 hr	N-CG	1.59	1.59	0
25 yr 72 hr	N-CG-A01	3.38	2.02	-1.36
25 yr 72 hr	N-CG-A02x	3.39	2.09	-1.3
25 yr 72 hr	N-CG-A03x	3.39	2.23	-1.16
25 yr 72 hr	N-CH	1.59	1.59	0
25 yr 72 hr	N-CH-A01b	1.88	-0.09	-1.97
25 yr 72 hr	N-CH-A02	2.75	0.1	-2.65
25 yr 72 hr	N-CH-A03	3.93	0.56	-3.37
25 yr 72 hr	N-CH-A04	4.03	0.57	-3.46
25 yr 72 hr	N-CH-Added	#N/A	-0.22	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CH-B02	2.96	0.59	-2.37
25 yr 72 hr	N-CH-B03	3.9	2.03	-1.87
25 yr 72 hr	N-CH-B03x	3.08	0.6	-2.48
25 yr 72 hr	N-CH-B04	3.94	2.81	-1.13
25 yr 72 hr	N-CH-B04x	4.12	2.28	-1.84
25 yr 72 hr	N-CH-B05	4.75	3.22	-1.53
25 yr 72 hr	N-CH-B05x	4.05	2.84	-1.21
25 yr 72 hr	N-CH-B06	4.88	4.75	-0.13
25 yr 72 hr	N-CH-B06x	4.83	3.62	-1.21
25 yr 72 hr	N-CH-B07	5.93	5.89	-0.04
25 yr 72 hr	N-CH-C04	4.02	0.81	-3.21
25 yr 72 hr	N-CH-C05	4.04	1.02	-3.02
25 yr 72 hr	N-CH-C05x1	4.03	0.83	-3.2
25 yr 72 hr	N-CH-C05x2	4.03	0.81	-3.22
25 yr 72 hr	N-CH-C05x3	4.03	0.81	-3.22
25 yr 72 hr	N-CH-C06	4.04	1.06	-2.98
25 yr 72 hr	N-CH-C06x	4.04	1.02	-3.02
25 yr 72 hr	N-CH-C07x	4.04	1.12	-2.92
25 yr 72 hr	N-CH-D05	4.03	0.87	-3.16
25 yr 72 hr	N-CH-D06	4.03	1.14	-2.89
25 yr 72 hr	N-CH-D08x	4.04	1.5	-2.54
25 yr 72 hr	N-CH-E06	4.04	1.18	-2.86
25 yr 72 hr	N-CH-E07	4.04	1.19	-2.85
25 yr 72 hr	N-CH-F07	4.05	1.27	-2.78
25 yr 72 hr	N-CH-F08	4.05	1.31	-2.74
25 yr 72 hr	N-CH-G07	4.03	1.19	-2.84
25 yr 72 hr	N-CH-G08	4.03	1.27	-2.76
25 yr 72 hr	N-CH-G09	4.02	1.29	-2.73
25 yr 72 hr	N-CH-G10	4.02	1.42	-2.6
25 yr 72 hr	N-CH-G11	4.03	1.44	-2.59
25 yr 72 hr	N-CH-I04	3.99	1.19	-2.8
25 yr 72 hr	N-CH-I05x1	4.02	1.2	-2.82
25 yr 72 hr	N-CH-I05x2	4.01	1.35	-2.66
25 yr 72 hr	N-CH-I05x3	4.01	1.43	-2.58
25 yr 72 hr	N-CH-I05x4	4.02	1.2	-2.82
25 yr 72 hr	N-CI	1.59	1.59	0
25 yr 72 hr	N-D10	4.03	1.54	-2.49
25 yr 72 hr	N-D16	2.55	3.67	1.12
25 yr 72 hr	N-D19	4.89	4.7	-0.19
25 yr 72 hr	N-D20	4.89	4.5	-0.39
25 yr 72 hr	N-D22	4.86	4.76	-0.1
25 yr 72 hr	N-D30	4.87	4.25	-0.62
25 yr 72 hr	N-DA	1.59	1.59	0
25 yr 72 hr	N-DA-A01	3.76	-0.46	-4.22

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Area BCDE Long Range Alternatives Selected Alternative with Existing Conditions Tailwater (2BC,3D,1E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DB	1.59	1.59	0
25 yr 72 hr	N-DC	1.59	1.59	0
25 yr 72 hr	N-DI-A01	3.98	-1.11	-5.09
25 yr 72 hr	N-DI-A02	4.02	-0.38	-4.4
25 yr 72 hr	N-DI-B04	4.51	1.1	-3.41
25 yr 72 hr	N-DI-B05	4.32	1.25	-3.07
25 yr 72 hr	N-DI-B05x	4.83	1.1	-3.73
25 yr 72 hr	N-DI-B06	4.33	1.4	-2.93
25 yr 72 hr	N-DI-B07	4.83	1.55	-3.28
25 yr 72 hr	N-DI-B08	4.83	1.87	-2.96
25 yr 72 hr	N-DI-B09	4.85	2.22	-2.63
25 yr 72 hr	N-DI-B10	4.87	2.99	-1.88
25 yr 72 hr	N-DI-B10x	4.85	2.23	-2.62
25 yr 72 hr	N-DI-B11	4.86	2.99	-1.87
25 yr 72 hr	N-DI-C03	4.09	0.23	-3.86
25 yr 72 hr	N-DI-C04	4.86	4.72	-0.14
25 yr 72 hr	N-DI-C05	4.76	3.61	-1.15
25 yr 72 hr	N-DP	4.39	1.38	-3.01
25 yr 72 hr	N-DP-A01	4.54	1.86	-2.68
25 yr 72 hr	N-DP-A02	4.59	2.23	-2.36
25 yr 72 hr	N-DP-A04	4.62	3.55	-1.07
25 yr 72 hr	N-DP-A07	4.89	3.61	-1.28
25 yr 72 hr	N-DP-A08	4.89	3.6	-1.29
25 yr 72 hr	N-DP-A09	4.88	3.26	-1.62
25 yr 72 hr	N-DP-A09x	4.89	3.64	-1.25
25 yr 72 hr	N-DP-A10	4.88	3.35	-1.53
25 yr 72 hr	N-DP-A11x	4.88	3.36	-1.52
25 yr 72 hr	N-DP-B2	4.57	2.09	-2.48
25 yr 72 hr	N-DP-C02	4.59	2.55	-2.04
25 yr 72 hr	N-DP-C03	3.76	1.07	-2.69
25 yr 72 hr	N-DP-C03x	4.59	2.57	-2.02
25 yr 72 hr	N-DP-D02	4.64	3.28	-1.36
25 yr 72 hr	N-DP-D03x	4.87	4.81	-0.06
25 yr 72 hr	N-DP-D04	4.85	3.83	-1.02
25 yr 72 hr	N-DP-D05x	4.88	4.12	-0.76
25 yr 72 hr	N-DP-D06x	4.94	4.36	-0.58
25 yr 72 hr	N-DP-D07x	5.03	4.48	-0.55
25 yr 72 hr	N-DP-D08x	5.1	4.55	-0.55
25 yr 72 hr	N-DP-D09	5.19	4.69	-0.5
25 yr 72 hr	N-DP-D10	5.55	5.51	-0.04
25 yr 72 hr	N-DP-E05	4.89	4.18	-0.71
25 yr 72 hr	N-DP-E06	4.92	4.9	-0.02
25 yr 72 hr	N-DP-E08	4.89	4.69	-0.2
25 yr 72 hr	N-DP-F07	5.89	5.72	-0.17

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Area BCDE Long Range Alternatives Selected Alternative with Existing Conditions Tailwater (2BC,3D,1E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DP-F08	5.13	4.68	-0.45
25 yr 72 hr	N-DP-F09	5.37	5.11	-0.26
25 yr 72 hr	N-DP-G05	4.58	3.66	-0.92
25 yr 72 hr	N-DP-G06	4.58	0.89	-3.69
25 yr 72 hr	N-DP-G07	4.58	1.94	-2.64
25 yr 72 hr	N-DP-G07x	4.57	0.89	-3.68
25 yr 72 hr	N-DP-G08	4.62	3.2	-1.42
25 yr 72 hr	N-DP-G08x	4.58	1.95	-2.63
25 yr 72 hr	N-DP-H04	4.58	2.24	-2.34
25 yr 72 hr	N-DP-H05	4.58	2.26	-2.32
25 yr 72 hr	N-DP-H05x	4.58	3.8	-0.78
25 yr 72 hr	N-DP-H06	4.57	0.57	-4
25 yr 72 hr	N-DP-H06x	4.58	4.06	-0.52
25 yr 72 hr	N-DP-K07	4.58	0.6	-3.98
25 yr 72 hr	N-DP-M10	5.26	4.77	-0.49
25 yr 72 hr	N-DP-M11	5.31	4.55	-0.76
25 yr 72 hr	N-DP-M12	5.38	5.28	-0.1
25 yr 72 hr	N-DP-N10	5.12	4.59	-0.53
25 yr 72 hr	N-DP-O10	4.88	3.34	-1.54
25 yr 72 hr	N-DP-O11	4.89	3.49	-1.4
25 yr 72 hr	N-DP-P06	4.64	4.55	-0.09
25 yr 72 hr	N-DP-Y03	5.12	5.12	0
25 yr 72 hr	N-DP-Z12	4.4	4.12	-0.28
25 yr 72 hr	N-DQ-A01	4.55	-0.34	-4.89
25 yr 72 hr	N-DQ-A01x	#N/A	0.05	#N/A
25 yr 72 hr	N-DQ-A02	4.56	3.13	-1.43
25 yr 72 hr	N-DQ-A03	4.55	-0.69	-5.24
25 yr 72 hr	N-DQ-A03x	3.13	-1.92	-5.05
25 yr 72 hr	N-DQ-A04	5.57	5.57	0
25 yr 72 hr	N-DQ-A05	4.36	-1.47	-5.83
25 yr 72 hr	N-DQ-A06	4.55	3.38	-1.17
25 yr 72 hr	N-DQ-A07	4.55	3.43	-1.12
25 yr 72 hr	N-DQ-A08	4.55	3.47	-1.08
25 yr 72 hr	N-E01	2.93	2.92	-0.01
25 yr 72 hr	N-E02	3.39	3.4	0.01
25 yr 72 hr	N-E03	4.02	4.02	0
25 yr 72 hr	N-E07	4.54	4.54	0
25 yr 72 hr	N-E08	3.82	3.82	0
25 yr 72 hr	N-E10	3.74	3.74	0
25 yr 72 hr	N-E11	2.57	2.78	0.21
25 yr 72 hr	N-EA	1.59	1.59	0
25 yr 72 hr	N-EA-A01	3.86	2.15	-1.71
25 yr 72 hr	N-EA-A02	3.86	2.21	-1.65
25 yr 72 hr	N-EB	1.59	1.59	0

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-EB-A01	3.03	3.16	0.13
25 yr 72 hr	N-EC	1.59	1.59	0
25 yr 72 hr	N-EC-A01	3.11	3.25	0.14
25 yr 72 hr	N-ED	1.59	1.59	0
25 yr 72 hr	N-ED-A01	3.63	2.16	-1.47
25 yr 72 hr	N-ED-A02	3.64	2.14	-1.5
25 yr 72 hr	N-ED-A03	3.64	2.42	-1.22
25 yr 72 hr	N-EE	1.59	1.59	0
25 yr 72 hr	N-EE-A01	3.71	2.08	-1.63
25 yr 72 hr	N-EF	1.59	1.59	0
25 yr 72 hr	N-EF-A01	3.71	3.22	-0.49
25 yr 72 hr	N-EG	1.59	1.59	0
25 yr 72 hr	N-EG-A01	3.46	2.18	-1.28
25 yr 72 hr	N-EG-A02	3.66	1.99	-1.67
25 yr 72 hr	N-EH	1.59	1.59	0
25 yr 72 hr	N-EH-A01	2.02	1.43	-0.59
25 yr 72 hr	N-EI	1.59	1.59	0
25 yr 72 hr	N-EJ	1.59	1.59	0
25 yr 72 hr	N-EJ-A01	1.65	1.65	0
25 yr 72 hr	N-EK	1.59	1.59	0
25 yr 72 hr	N-EK-A01	3.76	3.76	0
25 yr 72 hr	N-EL	1.59	1.59	0
25 yr 72 hr	N-EL-A01	3.04	3.02	-0.02
25 yr 72 hr	N-EM	1.59	1.59	0
25 yr 72 hr	N-EM-A01	2.83	2.97	0.14
25 yr 72 hr	N-EM-A02	2.74	2.95	0.21
25 yr 72 hr	N-EM-A03	2.57	2.79	0.22
25 yr 72 hr	N-EN	1.59	1.59	0
25 yr 72 hr	N-EN-A01	2.92	2.73	-0.19
25 yr 72 hr	N-EO	1.59	1.59	0
25 yr 72 hr	N-EO-A01	2.46	2.77	0.31
25 yr 72 hr	N-EP	1.59	1.59	0
25 yr 72 hr	N-EP-A01	2.56	2.78	0.22
25 yr 72 hr	N-EQ	1.59	1.59	0
25 yr 72 hr	N-EQ-A01	1.67	1.67	0
25 yr 72 hr	N-ER	1.59	1.59	0
25 yr 72 hr	N-ES	1.59	1.59	0
25 yr 72 hr	N-ET	1.59	1.59	0
25 yr 72 hr	N-ET-A01	1.6	3.41	1.81
25 yr 72 hr	N-P-B-A01-DSJ	#N/A	-1.85	#N/A
25 yr 72 hr	N-P-BE-A02-DSJ	#N/A	-2.3	#N/A
25 yr 72 hr	N-Pump-C3	#N/A	1.17	#N/A
25 yr 72 hr	NAltAdd_01	#N/A	1.73	#N/A
25 yr 72 hr	P-CG-A01-DSJ	#N/A	1.91	#N/A

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Area BCDE Long Range Alternatives Selected Alternative with Existing Conditions Tailwater (2BC,3D,1E)25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	P-DA-A01-DSJ	#N/A	-2.08	#N/A
25 yr 72 hr	P-DI-A01-DSJ	#N/A	-1.99	#N/A
25 yr 72 hr	P-DQ-A01 DSJ	#N/A	-5.65	#N/A
25 yr 72 hr	P-EA-A01-DSJ	#N/A	2.07	#N/A
25 yr 72 hr	P-EL-A01-DSJ	#N/A	1.5	#N/A
25 yr 72 hr	P-EM-A01-DSJ	#N/A	2.97	#N/A
25 yr 72 hr	P-EN-A01-DSJ	#N/A	1.8	#N/A
25 yr 72 hr	P-EO-A01-DSJ	#N/A	2	#N/A
25 yr 72 hr	P-EP-A01-DSJ	#N/A	2.01	#N/A
25 yr 72 hr	Trunkline-Junction-1	#N/A	2.63	#N/A

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	9thSt-Node	#N/A	-2.67	#N/A
10 yr 1 hr	AltAdd-04-DSJ	#N/A	2.3	#N/A
10 yr 1 hr	N-BA	1.59	4.4	2.81
10 yr 1 hr	N-BA-A01	3.33	2.33	-1
10 yr 1 hr	N-BA-A02	3.37	2.41	-0.96
10 yr 1 hr	N-BA-A03	3.4	2.51	-0.89
10 yr 1 hr	N-BA-A03x	3.37	2.41	-0.96
10 yr 1 hr	N-BA-A04	3.46	2.58	-0.88
10 yr 1 hr	N-BA-A04x	3.4	2.61	-0.79
10 yr 1 hr	N-BA-A05	3.46	2.6	-0.86
10 yr 1 hr	N-BA-A06	3.58	2.68	-0.9
10 yr 1 hr	N-BA-A07	3.65	2.76	-0.89
10 yr 1 hr	N-BA-A07x	3.61	2.68	-0.93
10 yr 1 hr	N-BA-A08	3.76	2.77	-0.99
10 yr 1 hr	N-BA-A08x	3.65	3.06	-0.59
10 yr 1 hr	N-BA-A09	3.91	4.13	0.22
10 yr 1 hr	N-BA-B02	3.26	2.32	-0.94
10 yr 1 hr	N-BA-B03	3.26	2.14	-1.12
10 yr 1 hr	N-BA-B04	3.25	2.08	-1.17
10 yr 1 hr	N-BA-C03	3.33	2.4	-0.93
10 yr 1 hr	N-BA-C04	3.32	2.4	-0.92
10 yr 1 hr	N-BA-D05	3.48	2.63	-0.85
10 yr 1 hr	N-BA-D06	3.49	2.81	-0.68
10 yr 1 hr	N-BA-D07	3.65	3.21	-0.44
10 yr 1 hr	N-BA-D08	3.72	3.21	-0.51
10 yr 1 hr	N-BA-E09	3.76	2.81	-0.95
10 yr 1 hr	N-BA-F09	3.87	2.77	-1.1
10 yr 1 hr	N-BA-K04	3.39	3.04	-0.35
10 yr 1 hr	N-BA-K05	3.41	3.14	-0.27
10 yr 1 hr	N-BA-K06	3.6	3.43	-0.17
10 yr 1 hr	N-BA-K08	5.06	5.05	-0.01
10 yr 1 hr	N-BA-L06	3.54	3.11	-0.43
10 yr 1 hr	N-BA-Q05	3.38	-1.71	-5.09
10 yr 1 hr	N-BA-Q06	3.38	-1.71	-5.09
10 yr 1 hr	N-BA-Q06x	3.38	-1.74	-5.12
10 yr 1 hr	N-BA-Q07	3.38	-0.47	-3.85
10 yr 1 hr	N-BA-Q07x	3.37	-1.49	-4.86
10 yr 1 hr	N-BA-Q08	3.39	-0.3	-3.69
10 yr 1 hr	N-BA-R06	3.39	-1.67	-5.06
10 yr 1 hr	N-BA-R07	3.38	-1.68	-5.06
10 yr 1 hr	N-BA-R07x	3.4	-1.29	-4.69
10 yr 1 hr	N-BA-R08	3.38	-1.68	-5.06
10 yr 1 hr	N-BA-R08x	3.39	-1.67	-5.06
10 yr 1 hr	N-BA-R09	3.38	-1.69	-5.07

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Area BCDE Long Range Alternatives Existing Conditions Tailwater Unselected Alternative (3BC,2DE) 10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-BA-R10	3.38	-1.88	-5.26
10 yr 1 hr	N-BA-R11	3.37	-2.33	-5.7
10 yr 1 hr	N-BA-S06a	3.68	3.15	-0.53
10 yr 1 hr	N-BA-T07	3.69	2.51	-1.18
10 yr 1 hr	N-BA-T08	3.68	2.5	-1.18
10 yr 1 hr	N-BA-T08x	3.69	2.52	-1.17
10 yr 1 hr	N-BA-T09	3.4	2.49	-0.91
10 yr 1 hr	N-BA-T09x	3.68	2.51	-1.17
10 yr 1 hr	N-BA-T10	3.4	2.49	-0.91
10 yr 1 hr	N-BA-U02	3.32	2.41	-0.91
10 yr 1 hr	N-BA-U03	3.33	2.55	-0.78
10 yr 1 hr	N-BA-V07	3.75	3.73	-0.02
10 yr 1 hr	N-BA-W08	4.19	3.56	-0.63
10 yr 1 hr	N-BA-W09A	4.2	3.51	-0.69
10 yr 1 hr	N-BA-W09B	4.17	3.4	-0.77
10 yr 1 hr	N-BB	1.59	4.4	2.81
10 yr 1 hr	N-BB-A01	3.32	-2.43	-5.75
10 yr 1 hr	N-BB-A02	3.33	-2.34	-5.67
10 yr 1 hr	N-BB-A03	3.31	-0.47	-3.78
10 yr 1 hr	N-BB-A04	3.32	-0.46	-3.78
10 yr 1 hr	N-BC	1.59	4.4	2.81
10 yr 1 hr	N-BC-A01	2.39	2.55	0.16
10 yr 1 hr	N-BC-A02	4.78	3.04	-1.74
10 yr 1 hr	N-BD	1.59	4.4	2.81
10 yr 1 hr	N-BD-A01	3.33	-3.2	-6.53
10 yr 1 hr	N-BD-A02	3.36	-2.56	-5.92
10 yr 1 hr	N-BD-A02x	3.37	-2.54	-5.91
10 yr 1 hr	N-BD-A03	3.37	-1.81	-5.18
10 yr 1 hr	N-BD-A05	3.37	-1.92	-5.29
10 yr 1 hr	N-BD-B02	3.33	-3.19	-6.52
10 yr 1 hr	N-BD-B03	3.32	-1.36	-4.68
10 yr 1 hr	N-BD-B04	3.32	2.41	-0.91
10 yr 1 hr	N-BD-B04x	3.32	-2.64	-5.96
10 yr 1 hr	N-BE	1.59	4.4	2.81
10 yr 1 hr	N-BE-A01	3.31	2.38	-0.93
10 yr 1 hr	N-BE-A03	3.39	2.49	-0.9
10 yr 1 hr	N-BE-A04	3.4	2.52	-0.88
10 yr 1 hr	N-BF	1.59	4.4	2.81
10 yr 1 hr	N-BF-A01	3.9	3.92	0.02
10 yr 1 hr	N-CA	1.59	4.4	2.81
10 yr 1 hr	N-CA-A01c	5.81	4.47	-1.34
10 yr 1 hr	N-CA-A01d	3.23	2.94	-0.29
10 yr 1 hr	N-CA-A02	3.35	3.07	-0.28
10 yr 1 hr	N-CA-A03	3.37	3.12	-0.25

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-A04	3.4	3.24	-0.16
10 yr 1 hr	N-CA-A05	3.41	3.32	-0.09
10 yr 1 hr	N-CA-A07	4.72	4.89	0.17
10 yr 1 hr	N-CA-B03	3.36	3.09	-0.27
10 yr 1 hr	N-CA-B04	3.38	3.13	-0.25
10 yr 1 hr	N-CA-B07	4.35	4.36	0.01
10 yr 1 hr	N-CA-C03	3.13	-0.91	-4.04
10 yr 1 hr	N-CA-C04	3.11	-0.91	-4.02
10 yr 1 hr	N-CA-C05	3.14	2.79	-0.35
10 yr 1 hr	N-CA-D06	3.62	3.63	0.01
10 yr 1 hr	N-CA-D07	3.62	3.64	0.02
10 yr 1 hr	N-CA-D07x	3.79	3.8	0.01
10 yr 1 hr	N-CA-D08	3.13	1.89	-1.24
10 yr 1 hr	N-CA-D08x	3.64	3.65	0.01
10 yr 1 hr	N-CA-D09x	3.13	2.56	-0.57
10 yr 1 hr	N-CA-E07	4.42	4.41	-0.01
10 yr 1 hr	N-CA-E08	4.43	4.41	-0.02
10 yr 1 hr	N-CA-E09x	4.57	4.41	-0.16
10 yr 1 hr	N-CA-F04	3.37	-0.89	-4.26
10 yr 1 hr	N-CA-F05	3.09	-0.87	-3.96
10 yr 1 hr	N-CA-F05x	3.19	-0.9	-4.09
10 yr 1 hr	N-CA-F06	3.08	-0.89	-3.97
10 yr 1 hr	N-CA-F06x	3.07	-0.85	-3.92
10 yr 1 hr	N-CA-F07	3.08	-0.88	-3.96
10 yr 1 hr	N-CA-F07x	3.07	-0.87	-3.94
10 yr 1 hr	N-CA-F08	3.09	-0.62	-3.71
10 yr 1 hr	N-CA-F09	3.09	-0.68	-3.77
10 yr 1 hr	N-CA-F09x	3.09	-0.61	-3.7
10 yr 1 hr	N-CA-F10	3.1	-0.82	-3.92
10 yr 1 hr	N-CA-F11	3.1	-0.89	-3.99
10 yr 1 hr	N-CA-F11x	3.09	-0.5	-3.59
10 yr 1 hr	N-CA-F12	3.1	-2.3	-5.4
10 yr 1 hr	N-CA-F12x	3.1	0.99	-2.11
10 yr 1 hr	N-CA-G08	3.1	-0.14	-3.24
10 yr 1 hr	N-CA-G09	3.1	1.26	-1.84
10 yr 1 hr	N-CA-G10	3.39	2.81	-0.58
10 yr 1 hr	N-CA-G11x	3.37	2.83	-0.54
10 yr 1 hr	N-CA-H09	3.1	-0.55	-3.65
10 yr 1 hr	N-CA-H10	3.1	-0.54	-3.64
10 yr 1 hr	N-CA-H10x	3.1	-0.54	-3.64
10 yr 1 hr	N-CA-H11	3.12	-0.42	-3.54
10 yr 1 hr	N-CA-H11x	3.1	-0.57	-3.67
10 yr 1 hr	N-CA-H12	3.12	-0.38	-3.5
10 yr 1 hr	N-CA-H13	3.24	1.18	-2.06

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Area BCDE Long Range Alternatives Existing Conditions Tailwater Unselected Alternative (3BC,2DE) 10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CA-H14	3.32	1.27	-2.05
10 yr 1 hr	N-CA-I12	3.12	-0.43	-3.55
10 yr 1 hr	N-CA-I13	3.12	-0.45	-3.57
10 yr 1 hr	N-CA-I14	3.12	-0.48	-3.6
10 yr 1 hr	N-CA-J14	3.26	2.18	-1.08
10 yr 1 hr	N-CA-J15x	3.3	2.23	-1.07
10 yr 1 hr	N-CA-K03	3.36	3.04	-0.32
10 yr 1 hr	N-CA-L04	3.38	3.09	-0.29
10 yr 1 hr	N-CA-L05	3.52	3.1	-0.42
10 yr 1 hr	N-CA-M06	3.55	3.15	-0.4
10 yr 1 hr	N-CA-N05	3.57	3.54	-0.03
10 yr 1 hr	N-CA-O08	4.93	4.89	-0.04
10 yr 1 hr	N-CA-S05	3.23	0.01	-3.22
10 yr 1 hr	N-CA-T08	3.06	-0.9	-3.96
10 yr 1 hr	N-CA-T09	3.06	-0.9	-3.96
10 yr 1 hr	N-CB	1.59	4.4	2.81
10 yr 1 hr	N-CB-A01	3	-0.93	-3.93
10 yr 1 hr	N-CB-Added	#N/A	-0.93	#N/A
10 yr 1 hr	N-CC	1.59	4.4	2.81
10 yr 1 hr	N-CC-A01	2.81	-0.93	-3.74
10 yr 1 hr	N-CC-A02	2.84	0.96	-1.88
10 yr 1 hr	N-CC-A03	3.06	1.09	-1.97
10 yr 1 hr	N-CE	1.59	4.4	2.81
10 yr 1 hr	N-CE-A01	3.1	-2.71	-5.81
10 yr 1 hr	N-CE-A02	3.1	-0.65	-3.75
10 yr 1 hr	N-CE-A03	3.1	0.38	-2.72
10 yr 1 hr	N-CF	1.59	4.4	2.81
10 yr 1 hr	N-CF-A01	3.12	-2.71	-5.83
10 yr 1 hr	N-CF-A02	3.12	-0.66	-3.78
10 yr 1 hr	N-CF-A03x	3.12	-0.66	-3.78
10 yr 1 hr	N-CG	1.59	4.4	2.81
10 yr 1 hr	N-CG-A01	3.12	2.65	-0.47
10 yr 1 hr	N-CG-A02x	3.12	2.84	-0.28
10 yr 1 hr	N-CG-A03x	3.26	3	-0.26
10 yr 1 hr	N-CH	1.59	4.4	2.81
10 yr 1 hr	N-CH-A01b	1.81	2.5	0.69
10 yr 1 hr	N-CH-A02	2.23	2.53	0.3
10 yr 1 hr	N-CH-A03	3.64	2.59	-1.05
10 yr 1 hr	N-CH-A04	3.76	2.56	-1.2
10 yr 1 hr	N-CH-Added	#N/A	2.49	#N/A
10 yr 1 hr	N-CH-B02	2.87	2.61	-0.26
10 yr 1 hr	N-CH-B03	3.84	2.78	-1.06
10 yr 1 hr	N-CH-B03x	2.89	2.62	-0.27
10 yr 1 hr	N-CH-B04	3.91	3.81	-0.1

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Area BCDE Long Range Alternatives Existing Conditions Tailwater Unselected Alternative (3BC,2DE) 10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-CH-B04x	4.04	2.88	-1.16
10 yr 1 hr	N-CH-B05	4.72	4.48	-0.24
10 yr 1 hr	N-CH-B05x	3.99	3.85	-0.14
10 yr 1 hr	N-CH-B06	4.88	4.86	-0.02
10 yr 1 hr	N-CH-B06x	4.82	4.78	-0.04
10 yr 1 hr	N-CH-B07	5.89	5.88	-0.01
10 yr 1 hr	N-CH-C04	3.75	2.68	-1.07
10 yr 1 hr	N-CH-C05	3.77	2.87	-0.9
10 yr 1 hr	N-CH-C05x1	3.77	2.69	-1.08
10 yr 1 hr	N-CH-C05x2	3.77	2.68	-1.09
10 yr 1 hr	N-CH-C05x3	3.77	2.68	-1.09
10 yr 1 hr	N-CH-C06	3.78	2.89	-0.89
10 yr 1 hr	N-CH-C06x	3.77	2.87	-0.9
10 yr 1 hr	N-CH-C07x	3.77	2.9	-0.87
10 yr 1 hr	N-CH-D05	3.77	2.7	-1.07
10 yr 1 hr	N-CH-D06	3.77	2.74	-1.03
10 yr 1 hr	N-CH-D08x	3.77	2.75	-1.02
10 yr 1 hr	N-CH-E06	3.78	2.88	-0.9
10 yr 1 hr	N-CH-E07	3.78	2.89	-0.89
10 yr 1 hr	N-CH-F07	3.78	2.89	-0.89
10 yr 1 hr	N-CH-F08	3.78	2.89	-0.89
10 yr 1 hr	N-CH-G07	3.77	2.74	-1.03
10 yr 1 hr	N-CH-G08	3.77	2.75	-1.02
10 yr 1 hr	N-CH-G09	3.77	2.74	-1.03
10 yr 1 hr	N-CH-G10	3.77	2.76	-1.01
10 yr 1 hr	N-CH-G11	3.77	2.75	-1.02
10 yr 1 hr	N-CH-I04	3.73	2.7	-1.03
10 yr 1 hr	N-CH-I05x1	3.76	2.71	-1.05
10 yr 1 hr	N-CH-I05x2	3.76	2.74	-1.02
10 yr 1 hr	N-CH-I05x3	3.76	2.8	-0.96
10 yr 1 hr	N-CH-I05x4	3.76	2.71	-1.05
10 yr 1 hr	N-CI	1.59	4.4	2.81
10 yr 1 hr	N-D10	3.77	2.75	-1.02
10 yr 1 hr	N-D16	2.53	3.64	1.11
10 yr 1 hr	N-D19	4.78	4.67	-0.11
10 yr 1 hr	N-D20	4.77	4.44	-0.33
10 yr 1 hr	N-D22	4.79	4.75	-0.04
10 yr 1 hr	N-D30	4.76	4.23	-0.53
10 yr 1 hr	N-DA	1.59	4.4	2.81
10 yr 1 hr	N-DA-A01	3.36	0.03	-3.33
10 yr 1 hr	N-DB	1.59	4.4	2.81
10 yr 1 hr	N-DC	1.59	4.4	2.81
10 yr 1 hr	N-DI-A01	3.51	-0.82	-4.33
10 yr 1 hr	N-DI-A02	3.52	0.03	-3.49

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DI-B04	4.27	0.85	-3.42
10 yr 1 hr	N-DI-B05	4.03	0.97	-3.06
10 yr 1 hr	N-DI-B05x	4.71	0.85	-3.86
10 yr 1 hr	N-DI-B06	4.04	1.09	-2.95
10 yr 1 hr	N-DI-B07	4.72	1.21	-3.51
10 yr 1 hr	N-DI-B08	4.72	1.47	-3.25
10 yr 1 hr	N-DI-B09	4.73	1.78	-2.95
10 yr 1 hr	N-DI-B10	4.75	2.61	-2.14
10 yr 1 hr	N-DI-B10x	4.73	1.83	-2.9
10 yr 1 hr	N-DI-B11	4.74	2.62	-2.12
10 yr 1 hr	N-DI-C03	3.55	0.3	-3.25
10 yr 1 hr	N-DI-C04	4.78	2.81	-1.97
10 yr 1 hr	N-DI-C05	4.52	-0.48	-5
10 yr 1 hr	N-DP	4.17	-3.6	-7.77
10 yr 1 hr	N-DP-A01	4.32	-2.82	-7.14
10 yr 1 hr	N-DP-A02	4.36	-2.32	-6.68
10 yr 1 hr	N-DP-A04	4.39	-0.32	-4.71
10 yr 1 hr	N-DP-A07	4.77	3.04	-1.73
10 yr 1 hr	N-DP-A08	4.77	3.04	-1.73
10 yr 1 hr	N-DP-A09	4.77	2.81	-1.96
10 yr 1 hr	N-DP-A09x	4.77	3.05	-1.72
10 yr 1 hr	N-DP-A10	4.76	2.86	-1.9
10 yr 1 hr	N-DP-A11x	4.76	2.87	-1.89
10 yr 1 hr	N-DP-B2	4.35	-2.51	-6.86
10 yr 1 hr	N-DP-C02	4.37	-1.48	-5.85
10 yr 1 hr	N-DP-C03	3.36	1.06	-2.3
10 yr 1 hr	N-DP-C03x	4.37	0.87	-3.5
10 yr 1 hr	N-DP-D02	4.43	-0.77	-5.2
10 yr 1 hr	N-DP-D03x	4.82	4.63	-0.19
10 yr 1 hr	N-DP-D04	4.59	-0.3	-4.89
10 yr 1 hr	N-DP-D05x	4.64	-0.09	-4.73
10 yr 1 hr	N-DP-D06x	4.71	0.11	-4.6
10 yr 1 hr	N-DP-D07x	4.81	0.37	-4.44
10 yr 1 hr	N-DP-D08x	4.89	0.57	-4.32
10 yr 1 hr	N-DP-D09	5.01	1.44	-3.57
10 yr 1 hr	N-DP-D10	5.4	5.32	-0.08
10 yr 1 hr	N-DP-E05	4.74	4.11	-0.63
10 yr 1 hr	N-DP-E06	4.86	4.85	-0.01
10 yr 1 hr	N-DP-E08	4.78	4.65	-0.13
10 yr 1 hr	N-DP-F07	5.1	5.01	-0.09
10 yr 1 hr	N-DP-F08	4.94	4.62	-0.32
10 yr 1 hr	N-DP-F09	4.96	4.95	-0.01
10 yr 1 hr	N-DP-G05	4.36	0.05	-4.31
10 yr 1 hr	N-DP-G06	4.36	0.41	-3.95

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-DP-G07	4.36	0.57	-3.79
10 yr 1 hr	N-DP-G07x	4.35	0.41	-3.94
10 yr 1 hr	N-DP-G08	4.39	0.66	-3.73
10 yr 1 hr	N-DP-G08x	4.36	0.55	-3.81
10 yr 1 hr	N-DP-H04	4.36	-0.76	-5.12
10 yr 1 hr	N-DP-H05	4.36	0.1	-4.26
10 yr 1 hr	N-DP-H05x	4.36	3.79	-0.57
10 yr 1 hr	N-DP-H06	4.35	0.31	-4.04
10 yr 1 hr	N-DP-H06x	4.36	4.05	-0.31
10 yr 1 hr	N-DP-K07	4.36	0.31	-4.05
10 yr 1 hr	N-DP-M10	5.11	1.38	-3.73
10 yr 1 hr	N-DP-M11	5.2	0.79	-4.41
10 yr 1 hr	N-DP-M12	5.25	5.12	-0.13
10 yr 1 hr	N-DP-N10	4.89	0.01	-4.88
10 yr 1 hr	N-DP-O10	4.77	2.98	-1.79
10 yr 1 hr	N-DP-O11	4.88	3.18	-1.7
10 yr 1 hr	N-DP-P06	4.6	2.6	-2
10 yr 1 hr	N-DP-Y03	5.11	5.11	0
10 yr 1 hr	N-DP-Z12	4.26	4.09	-0.17
10 yr 1 hr	N-DQ-A01	4.33	-0.14	-4.47
10 yr 1 hr	N-DQ-A01x	#N/A	0.26	#N/A
10 yr 1 hr	N-DQ-A02	4.34	3.11	-1.23
10 yr 1 hr	N-DQ-A03	4.33	-0.51	-4.84
10 yr 1 hr	N-DQ-A03x	2.94	-4.19	-7.13
10 yr 1 hr	N-DQ-A04	5.32	5.6	0.28
10 yr 1 hr	N-DQ-A05	4.03	-2.57	-6.6
10 yr 1 hr	N-DQ-A06	4.33	3.36	-0.97
10 yr 1 hr	N-DQ-A07	4.33	3.4	-0.93
10 yr 1 hr	N-DQ-A08	4.33	3.45	-0.88
10 yr 1 hr	N-E01	2.9	4.4	1.5
10 yr 1 hr	N-E03	4	4.4	0.4
10 yr 1 hr	N-E07	4.49	4.53	0.04
10 yr 1 hr	N-E08	3.78	4.4	0.62
10 yr 1 hr	N-E10	3.71	4.4	0.69
10 yr 1 hr	N-E11	1.83	1.83	0
10 yr 1 hr	N-EA	1.59	4.4	2.81
10 yr 1 hr	N-EA-A01	3.81	3.76	-0.05
10 yr 1 hr	N-EA-A02	3.81	3.76	-0.05
10 yr 1 hr	N-EB	1.59	4.4	2.81
10 yr 1 hr	N-EB-A01	2.52	3.74	1.22
10 yr 1 hr	N-EC	1.59	4.4	2.81
10 yr 1 hr	N-EC-A01	2.69	3.74	1.05
10 yr 1 hr	N-ED	1.59	4.4	2.81
10 yr 1 hr	N-ED-A01	3.24	3.3	0.06

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Area BCDE Long Range Alternatives Existing Conditions Tailwater Unselected Alternative (3BC,2DE) 10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	N-ED-A02	3.41	3.48	0.07
10 yr 1 hr	N-ED-A03	3.51	3.59	0.08
10 yr 1 hr	N-EE	1.59	4.4	2.81
10 yr 1 hr	N-EE-A01	3.66	3.8	0.14
10 yr 1 hr	N-EF	1.59	4.4	2.81
10 yr 1 hr	N-EF-A01	3.11	3.8	0.69
10 yr 1 hr	N-EG	1.59	4.4	2.81
10 yr 1 hr	N-EG-A01	3.43	3.49	0.06
10 yr 1 hr	N-EG-A02	3.62	3.48	-0.14
10 yr 1 hr	N-EH	1.59	4.4	2.81
10 yr 1 hr	N-EH-A01	1.77	2.89	1.12
10 yr 1 hr	N-EI	1.59	4.4	2.81
10 yr 1 hr	N-EJ	1.59	4.4	2.81
10 yr 1 hr	N-EJ-A01	1.61	4.4	2.79
10 yr 1 hr	N-EK	1.59	4.4	2.81
10 yr 1 hr	N-EK-A01	3.68	4.4	0.72
10 yr 1 hr	N-EL	1.59	4.4	2.81
10 yr 1 hr	N-EL-A01	3.01	2.99	-0.02
10 yr 1 hr	N-EM	1.59	4.4	2.81
10 yr 1 hr	N-EM-A01	2.63	2.88	0.25
10 yr 1 hr	N-EM-A02	2.61	2.86	0.25
10 yr 1 hr	N-EM-A03	2	1.98	-0.02
10 yr 1 hr	N-EN	1.59	4.4	2.81
10 yr 1 hr	N-EN-A01	2.83	2.46	-0.37
10 yr 1 hr	N-EO	1.59	4.4	2.81
10 yr 1 hr	N-EO-A01	2.22	2.21	-0.01
10 yr 1 hr	N-EP	1.59	4.4	2.81
10 yr 1 hr	N-EP-A01	1.98	1.98	0
10 yr 1 hr	N-EQ	1.59	4.4	2.81
10 yr 1 hr	N-EQ-A01	1.65	4.44	2.79
10 yr 1 hr	N-ER	1.59	4.4	2.81
10 yr 1 hr	N-ES	1.59	4.4	2.81
10 yr 1 hr	N-ET	1.59	4.4	2.81
10 yr 1 hr	N-ET-A01	1.59	1.65	0.06
10 yr 1 hr	NAltAdd_01	#N/A	3.43	#N/A
10 yr 1 hr	NZA-0110	#N/A	2.56	#N/A
10 yr 1 hr	NZA-0120	#N/A	2.4	#N/A
10 yr 1 hr	NZA-0130	#N/A	1.83	#N/A
10 yr 1 hr	NZA-0150	#N/A	2.85	#N/A
10 yr 1 hr	NZA-0160	#N/A	2.04	#N/A
10 yr 1 hr	P-Added-7-DSJ	#N/A	-2.8	#N/A
10 yr 1 hr	P-Added-9-DSJ	#N/A	-3.2	#N/A
10 yr 1 hr	P-BA-A01-DSJ	#N/A	2.27	#N/A
10 yr 1 hr	P-BA-D08-Added-6-DSJ	#N/A	-2.5	#N/A

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Area BCDE Long Range Alternatives Existing Conditions Tailwater Unselected Alternative (3BC,2DE) 10-Year, 1-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
10 yr 1 hr	P-BB-A01-DSJ	#N/A	-3.2	#N/A
10 yr 1 hr	P-BC-A01-DSJ	#N/A	1.5	#N/A
10 yr 1 hr	P-BD-A02-DSJ	#N/A	-3.2	#N/A
10 yr 1 hr	P-BE-A01-Added-1-DSJ	#N/A	2.28	#N/A
10 yr 1 hr	P-BE-A01-DSJ	#N/A	2.32	#N/A
10 yr 1 hr	P-CC-A01-DSJ	#N/A	-0.93	#N/A
10 yr 1 hr	P-CE-A01-DSJ	#N/A	-2.8	#N/A
10 yr 1 hr	P-CF-A01-DSJ	#N/A	-2.8	#N/A
10 yr 1 hr	P-CG-A01-DSJ	#N/A	2	#N/A
10 yr 1 hr	P-ED-A01-DSJ	#N/A	2.3	#N/A
10 yr 1 hr	P-EL-A01-DSJ	#N/A	1.5	#N/A
10 yr 1 hr	P-EM-A01-DSJ	#N/A	2.88	#N/A
10 yr 1 hr	P-EN-A01-DSJ	#N/A	1.8	#N/A
10 yr 1 hr	P-EO-A01-DSJ	#N/A	2	#N/A
10 yr 1 hr	P-EP-A01-DSJ	#N/A	1.98	#N/A
10 yr 1 hr	oposed-Trunkline-1-D	#N/A	2.71	#N/A
10 yr 1 hr	Pump D2 Node	#N/A	-2.08	#N/A
10 yr 1 hr	Trunkline-Junction-1	#N/A	3.01	#N/A

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Area BCDE Long Range Alternatives Existing Condition Tailwater Unselected Alternative (3BC,2DE) 25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	9thSt-Node	#N/A	1.93	#N/A
25 yr 72 hr	AltAdd-04-DSJ	#N/A	2.3	#N/A
25 yr 72 hr	N-BA	1.59	4.4	2.81
25 yr 72 hr	N-BA-A01	3.55	3.11	-0.44
25 yr 72 hr	N-BA-A02	3.6	3.16	-0.44
25 yr 72 hr	N-BA-A03	3.64	3.22	-0.42
25 yr 72 hr	N-BA-A03x	3.6	3.16	-0.44
25 yr 72 hr	N-BA-A04	3.71	3.29	-0.42
25 yr 72 hr	N-BA-A04x	3.63	3.21	-0.42
25 yr 72 hr	N-BA-A05	3.72	3.3	-0.42
25 yr 72 hr	N-BA-A06	3.78	3.49	-0.29
25 yr 72 hr	N-BA-A07	3.82	3.6	-0.22
25 yr 72 hr	N-BA-A07x	3.81	3.54	-0.27
25 yr 72 hr	N-BA-A08	3.83	3.62	-0.21
25 yr 72 hr	N-BA-A08x	3.82	3.6	-0.22
25 yr 72 hr	N-BA-A09	4.01	4.29	0.28
25 yr 72 hr	N-BA-B02	3.41	3.09	-0.32
25 yr 72 hr	N-BA-B03	3.41	3.09	-0.32
25 yr 72 hr	N-BA-B04	3.39	3.08	-0.31
25 yr 72 hr	N-BA-C03	3.57	3.12	-0.45
25 yr 72 hr	N-BA-C04	3.57	3.09	-0.48
25 yr 72 hr	N-BA-D05	3.73	3.31	-0.42
25 yr 72 hr	N-BA-D06	3.75	3.34	-0.41
25 yr 72 hr	N-BA-D07	3.85	3.6	-0.25
25 yr 72 hr	N-BA-D08	3.89	3.61	-0.28
25 yr 72 hr	N-BA-E09	3.83	3.62	-0.21
25 yr 72 hr	N-BA-F09	3.88	3.62	-0.26
25 yr 72 hr	N-BA-K04	3.69	3.23	-0.46
25 yr 72 hr	N-BA-K05	3.72	3.44	-0.28
25 yr 72 hr	N-BA-K06	3.78	3.69	-0.09
25 yr 72 hr	N-BA-K08	5.08	5.08	0
25 yr 72 hr	N-BA-L06	3.76	3.54	-0.22
25 yr 72 hr	N-BA-Q05	3.67	2.56	-1.11
25 yr 72 hr	N-BA-Q06	3.66	2.56	-1.1
25 yr 72 hr	N-BA-Q06x	3.67	2.54	-1.13
25 yr 72 hr	N-BA-Q07	3.68	2.76	-0.92
25 yr 72 hr	N-BA-Q07x	3.66	2.55	-1.11
25 yr 72 hr	N-BA-Q08	3.68	2.91	-0.77
25 yr 72 hr	N-BA-R06	3.69	3.04	-0.65
25 yr 72 hr	N-BA-R07	3.68	2.82	-0.86
25 yr 72 hr	N-BA-R07x	3.7	3.13	-0.57
25 yr 72 hr	N-BA-R08	3.66	2.77	-0.89
25 yr 72 hr	N-BA-R08x	3.68	2.82	-0.86
25 yr 72 hr	N-BA-R09	3.67	2.77	-0.9

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Area BCDE Long Range Alternatives Existing Condition Tailwater Unselected Alternative (3BC,2DE) 25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-BA-R10	3.67	2.77	-0.9
25 yr 72 hr	N-BA-R11	3.65	2.75	-0.9
25 yr 72 hr	N-BA-S06a	3.94	3.56	-0.38
25 yr 72 hr	N-BA-T07	3.73	3.22	-0.51
25 yr 72 hr	N-BA-T08	3.72	3.18	-0.54
25 yr 72 hr	N-BA-T08x	3.73	3.22	-0.51
25 yr 72 hr	N-BA-T09	3.69	3.13	-0.56
25 yr 72 hr	N-BA-T09x	3.71	3.18	-0.53
25 yr 72 hr	N-BA-T10	3.69	3.13	-0.56
25 yr 72 hr	N-BA-U02	3.55	3.11	-0.44
25 yr 72 hr	N-BA-U03	3.56	3.12	-0.44
25 yr 72 hr	N-BA-V07	3.8	3.78	-0.02
25 yr 72 hr	N-BA-W08	4.54	4.49	-0.05
25 yr 72 hr	N-BA-W09A	4.55	4.5	-0.05
25 yr 72 hr	N-BA-W09B	4.51	4.46	-0.05
25 yr 72 hr	N-BB	1.59	4.4	2.81
25 yr 72 hr	N-BB-A01	3.6	2.64	-0.96
25 yr 72 hr	N-BB-A02	3.59	2.73	-0.86
25 yr 72 hr	N-BB-A03	3.57	2.73	-0.84
25 yr 72 hr	N-BB-A04	3.58	2.73	-0.85
25 yr 72 hr	N-BC	1.59	4.4	2.81
25 yr 72 hr	N-BC-A01	2.54	2.66	0.12
25 yr 72 hr	N-BC-A02	4.82	3.24	-1.58
25 yr 72 hr	N-BD	1.59	4.4	2.81
25 yr 72 hr	N-BD-A01	3.59	1.32	-2.27
25 yr 72 hr	N-BD-A02	3.64	2.13	-1.51
25 yr 72 hr	N-BD-A02x	3.65	2.19	-1.46
25 yr 72 hr	N-BD-A03	3.65	2.23	-1.42
25 yr 72 hr	N-BD-A05	3.64	2.4	-1.24
25 yr 72 hr	N-BD-B02	3.59	1.34	-2.25
25 yr 72 hr	N-BD-B03	3.57	1.61	-1.96
25 yr 72 hr	N-BD-B04	3.64	2.61	-1.03
25 yr 72 hr	N-BD-B04x	3.57	1.94	-1.63
25 yr 72 hr	N-BE	1.59	4.4	2.81
25 yr 72 hr	N-BE-A01	3.56	3.07	-0.49
25 yr 72 hr	N-BE-A03	3.68	3.12	-0.56
25 yr 72 hr	N-BE-A04	3.68	3.14	-0.54
25 yr 72 hr	N-BF	1.59	4.4	2.81
25 yr 72 hr	N-BF-A01	4.06	4.06	0
25 yr 72 hr	N-CA	1.59	4.4	2.81
25 yr 72 hr	N-CA-A01c	5.81	4.47	-1.34
25 yr 72 hr	N-CA-A01d	3.45	3.17	-0.28
25 yr 72 hr	N-CA-A02	3.58	3.29	-0.29
25 yr 72 hr	N-CA-A03	3.59	3.32	-0.27

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-A04	3.6	3.37	-0.23
25 yr 72 hr	N-CA-A05	3.6	3.41	-0.19
25 yr 72 hr	N-CA-A07	5.04	5.21	0.17
25 yr 72 hr	N-CA-B03	3.59	3.31	-0.28
25 yr 72 hr	N-CA-B04	3.6	3.34	-0.26
25 yr 72 hr	N-CA-B07	4.7	4.68	-0.02
25 yr 72 hr	N-CA-C03	3.38	0.17	-3.21
25 yr 72 hr	N-CA-C04	3.35	0.38	-2.97
25 yr 72 hr	N-CA-C05	3.39	2.88	-0.51
25 yr 72 hr	N-CA-D06	3.64	3.65	0.01
25 yr 72 hr	N-CA-D07	3.65	3.66	0.01
25 yr 72 hr	N-CA-D07x	3.81	3.82	0.01
25 yr 72 hr	N-CA-D08	3.4	2.04	-1.36
25 yr 72 hr	N-CA-D08x	3.66	3.66	0
25 yr 72 hr	N-CA-D09x	3.4	2.63	-0.77
25 yr 72 hr	N-CA-E07	4.8	4.77	-0.03
25 yr 72 hr	N-CA-E08	4.82	4.79	-0.03
25 yr 72 hr	N-CA-E09x	5.03	4.8	-0.23
25 yr 72 hr	N-CA-F04	3.56	1.14	-2.42
25 yr 72 hr	N-CA-F05	3.36	1.21	-2.15
25 yr 72 hr	N-CA-F05x	3.43	1.02	-2.41
25 yr 72 hr	N-CA-F06	3.35	1.03	-2.32
25 yr 72 hr	N-CA-F06x	3.33	1.22	-2.11
25 yr 72 hr	N-CA-F07	3.34	0.3	-3.04
25 yr 72 hr	N-CA-F07x	3.33	1.03	-2.3
25 yr 72 hr	N-CA-F08	3.36	-0.29	-3.65
25 yr 72 hr	N-CA-F09	3.36	-0.36	-3.72
25 yr 72 hr	N-CA-F09x	3.36	-0.28	-3.64
25 yr 72 hr	N-CA-F10	3.37	-0.53	-3.9
25 yr 72 hr	N-CA-F11	3.37	-0.61	-3.98
25 yr 72 hr	N-CA-F11x	3.37	-0.36	-3.73
25 yr 72 hr	N-CA-F12	3.37	-1.91	-5.28
25 yr 72 hr	N-CA-F12x	3.37	1.1	-2.27
25 yr 72 hr	N-CA-G08	3.37	1.02	-2.35
25 yr 72 hr	N-CA-G09	3.38	2	-1.38
25 yr 72 hr	N-CA-G10	3.58	3.32	-0.26
25 yr 72 hr	N-CA-G11x	3.56	3.31	-0.25
25 yr 72 hr	N-CA-H09	3.38	-0.17	-3.55
25 yr 72 hr	N-CA-H10	3.38	-0.16	-3.54
25 yr 72 hr	N-CA-H10x	3.37	-0.17	-3.54
25 yr 72 hr	N-CA-H11	3.39	0.03	-3.36
25 yr 72 hr	N-CA-H11x	3.38	-0.2	-3.58
25 yr 72 hr	N-CA-H12	3.39	0.09	-3.3
25 yr 72 hr	N-CA-H13	3.4	1.3	-2.1

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Area BCDE Long Range Alternatives Existing Condition Tailwater Unselected Alternative (3BC,2DE) 25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CA-H14	3.41	1.41	-2
25 yr 72 hr	N-CA-I12	3.39	0.02	-3.37
25 yr 72 hr	N-CA-I13	3.39	0	-3.39
25 yr 72 hr	N-CA-I14	3.39	-0.05	-3.44
25 yr 72 hr	N-CA-J14	3.4	2.24	-1.16
25 yr 72 hr	N-CA-J15x	3.4	2.29	-1.11
25 yr 72 hr	N-CA-K03	3.62	3.26	-0.36
25 yr 72 hr	N-CA-L04	3.6	3.33	-0.27
25 yr 72 hr	N-CA-L05	3.73	3.5	-0.23
25 yr 72 hr	N-CA-M06	3.77	3.52	-0.25
25 yr 72 hr	N-CA-N05	3.66	3.63	-0.03
25 yr 72 hr	N-CA-O08	4.98	5.02	0.04
25 yr 72 hr	N-CA-S05	3.41	1.14	-2.27
25 yr 72 hr	N-CA-T08	3.32	0.17	-3.15
25 yr 72 hr	N-CA-T09	3.32	0.18	-3.14
25 yr 72 hr	N-CB	1.59	4.4	2.81
25 yr 72 hr	N-CB-A01	3.19	-0.67	-3.86
25 yr 72 hr	N-CB-Added	#N/A	-0.93	#N/A
25 yr 72 hr	N-CC	1.59	4.4	2.81
25 yr 72 hr	N-CC-A01	3.15	-0.27	-3.42
25 yr 72 hr	N-CC-A02	3.18	1.08	-2.1
25 yr 72 hr	N-CC-A03	3.31	1.25	-2.06
25 yr 72 hr	N-CE	1.59	4.4	2.81
25 yr 72 hr	N-CE-A01	3.37	-2.02	-5.39
25 yr 72 hr	N-CE-A02	3.37	-0.32	-3.69
25 yr 72 hr	N-CE-A03	3.37	0.51	-2.86
25 yr 72 hr	N-CF	1.59	4.4	2.81
25 yr 72 hr	N-CF-A01	3.38	-2.04	-5.42
25 yr 72 hr	N-CF-A02	3.38	-0.24	-3.62
25 yr 72 hr	N-CF-A03x	3.38	-0.23	-3.61
25 yr 72 hr	N-CG	1.59	4.4	2.81
25 yr 72 hr	N-CG-A01	3.38	2.75	-0.63
25 yr 72 hr	N-CG-A02x	3.39	2.93	-0.46
25 yr 72 hr	N-CG-A03x	3.39	3.11	-0.28
25 yr 72 hr	N-CH	1.59	4.4	2.81
25 yr 72 hr	N-CH-A01b	1.88	3.1	1.22
25 yr 72 hr	N-CH-A02	2.75	3.14	0.39
25 yr 72 hr	N-CH-A03	3.93	3.24	-0.69
25 yr 72 hr	N-CH-A04	4.03	3.25	-0.78
25 yr 72 hr	N-CH-Added	#N/A	3.09	#N/A
25 yr 72 hr	N-CH-B02	2.96	3.17	0.21
25 yr 72 hr	N-CH-B03	3.9	3.27	-0.63
25 yr 72 hr	N-CH-B03x	3.08	3.17	0.09
25 yr 72 hr	N-CH-B04	3.94	3.84	-0.1

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Area BCDE Long Range Alternatives Existing Condition Tailwater Unselected Alternative (3BC,2DE) 25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-CH-B04x	4.12	3.3	-0.82
25 yr 72 hr	N-CH-B05	4.75	4.53	-0.22
25 yr 72 hr	N-CH-B05x	4.05	3.89	-0.16
25 yr 72 hr	N-CH-B06	4.88	4.86	-0.02
25 yr 72 hr	N-CH-B06x	4.83	4.79	-0.04
25 yr 72 hr	N-CH-B07	5.93	5.93	0
25 yr 72 hr	N-CH-C04	4.02	3.32	-0.7
25 yr 72 hr	N-CH-C05	4.04	3.33	-0.71
25 yr 72 hr	N-CH-C05x1	4.03	3.33	-0.7
25 yr 72 hr	N-CH-C05x2	4.03	3.32	-0.71
25 yr 72 hr	N-CH-C05x3	4.03	3.33	-0.7
25 yr 72 hr	N-CH-C06	4.04	3.34	-0.7
25 yr 72 hr	N-CH-C06x	4.04	3.33	-0.71
25 yr 72 hr	N-CH-C07x	4.04	3.34	-0.7
25 yr 72 hr	N-CH-D05	4.03	3.33	-0.7
25 yr 72 hr	N-CH-D06	4.03	3.33	-0.7
25 yr 72 hr	N-CH-D08x	4.04	3.34	-0.7
25 yr 72 hr	N-CH-E06	4.04	3.34	-0.7
25 yr 72 hr	N-CH-E07	4.04	3.34	-0.7
25 yr 72 hr	N-CH-F07	4.05	3.34	-0.71
25 yr 72 hr	N-CH-F08	4.05	3.34	-0.71
25 yr 72 hr	N-CH-G07	4.03	3.34	-0.69
25 yr 72 hr	N-CH-G08	4.03	3.34	-0.69
25 yr 72 hr	N-CH-G09	4.02	3.34	-0.68
25 yr 72 hr	N-CH-G10	4.02	3.34	-0.68
25 yr 72 hr	N-CH-G11	4.03	3.34	-0.69
25 yr 72 hr	N-CH-I04	3.99	3.31	-0.68
25 yr 72 hr	N-CH-I05x1	4.02	3.33	-0.69
25 yr 72 hr	N-CH-I05x2	4.01	3.33	-0.68
25 yr 72 hr	N-CH-I05x3	4.01	3.33	-0.68
25 yr 72 hr	N-CH-I05x4	4.02	3.33	-0.69
25 yr 72 hr	N-CI	1.59	4.4	2.81
25 yr 72 hr	N-D10	4.03	3.34	-0.69
25 yr 72 hr	N-D16	2.55	3.67	1.12
25 yr 72 hr	N-D19	4.89	4.7	-0.19
25 yr 72 hr	N-D20	4.89	4.5	-0.39
25 yr 72 hr	N-D22	4.86	4.76	-0.1
25 yr 72 hr	N-D30	4.87	4.25	-0.62
25 yr 72 hr	N-DA	1.59	4.4	2.81
25 yr 72 hr	N-DA-A01	3.76	0.49	-3.27
25 yr 72 hr	N-DB	1.59	4.4	2.81
25 yr 72 hr	N-DC	1.59	4.4	2.81
25 yr 72 hr	N-DI-A01	3.98	-0.44	-4.42
25 yr 72 hr	N-DI-A02	4.02	0.49	-3.53

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Area BCDE Long Range Alternatives Existing Condition Tailwater Unselected Alternative (3BC,2DE) 25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DI-B04	4.51	1.29	-3.22
25 yr 72 hr	N-DI-B05	4.32	1.44	-2.88
25 yr 72 hr	N-DI-B05x	4.83	1.3	-3.53
25 yr 72 hr	N-DI-B06	4.33	1.57	-2.76
25 yr 72 hr	N-DI-B07	4.83	1.71	-3.12
25 yr 72 hr	N-DI-B08	4.83	1.91	-2.92
25 yr 72 hr	N-DI-B09	4.85	2.24	-2.61
25 yr 72 hr	N-DI-B10	4.87	2.99	-1.88
25 yr 72 hr	N-DI-B10x	4.85	2.26	-2.59
25 yr 72 hr	N-DI-B11	4.86	2.99	-1.87
25 yr 72 hr	N-DI-C03	4.09	0.75	-3.34
25 yr 72 hr	N-DI-C04	4.86	4.69	-0.17
25 yr 72 hr	N-DI-C05	4.76	4.08	-0.68
25 yr 72 hr	N-DP	4.39	2.81	-1.58
25 yr 72 hr	N-DP-A01	4.54	3.29	-1.25
25 yr 72 hr	N-DP-A02	4.59	3.72	-0.87
25 yr 72 hr	N-DP-A04	4.62	3.93	-0.69
25 yr 72 hr	N-DP-A07	4.89	3.61	-1.28
25 yr 72 hr	N-DP-A08	4.89	3.6	-1.29
25 yr 72 hr	N-DP-A09	4.88	3.26	-1.62
25 yr 72 hr	N-DP-A09x	4.89	3.64	-1.25
25 yr 72 hr	N-DP-A10	4.88	3.35	-1.53
25 yr 72 hr	N-DP-A11x	4.88	3.36	-1.52
25 yr 72 hr	N-DP-B2	4.57	3.65	-0.92
25 yr 72 hr	N-DP-C02	4.59	3.59	-1
25 yr 72 hr	N-DP-C03	3.76	1.08	-2.68
25 yr 72 hr	N-DP-C03x	4.59	3.6	-0.99
25 yr 72 hr	N-DP-D02	4.64	3.92	-0.72
25 yr 72 hr	N-DP-D03x	4.87	4.8	-0.07
25 yr 72 hr	N-DP-D04	4.85	4.19	-0.66
25 yr 72 hr	N-DP-D05x	4.88	4.34	-0.54
25 yr 72 hr	N-DP-D06x	4.94	4.5	-0.44
25 yr 72 hr	N-DP-D07x	5.03	4.57	-0.46
25 yr 72 hr	N-DP-D08x	5.1	4.61	-0.49
25 yr 72 hr	N-DP-D09	5.19	4.7	-0.49
25 yr 72 hr	N-DP-D10	5.55	5.51	-0.04
25 yr 72 hr	N-DP-E05	4.89	4.34	-0.55
25 yr 72 hr	N-DP-E06	4.92	4.9	-0.02
25 yr 72 hr	N-DP-E08	4.89	4.69	-0.2
25 yr 72 hr	N-DP-F07	5.89	5.78	-0.11
25 yr 72 hr	N-DP-F08	5.13	4.68	-0.45
25 yr 72 hr	N-DP-F09	5.37	5.11	-0.26
25 yr 72 hr	N-DP-G05	4.58	3.9	-0.68
25 yr 72 hr	N-DP-G06	4.58	3.91	-0.67

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Area BCDE Long Range Alternatives Existing Condition Tailwater Unselected Alternative (3BC,2DE) 25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-DP-G07	4.58	4	-0.58
25 yr 72 hr	N-DP-G07x	4.57	3.89	-0.68
25 yr 72 hr	N-DP-G08	4.62	4.15	-0.47
25 yr 72 hr	N-DP-G08x	4.58	3.99	-0.59
25 yr 72 hr	N-DP-H04	4.58	3.74	-0.84
25 yr 72 hr	N-DP-H05	4.58	3.77	-0.81
25 yr 72 hr	N-DP-H05x	4.58	3.8	-0.78
25 yr 72 hr	N-DP-H06	4.57	3.8	-0.77
25 yr 72 hr	N-DP-H06x	4.58	4.06	-0.52
25 yr 72 hr	N-DP-K07	4.58	3.87	-0.71
25 yr 72 hr	N-DP-M10	5.26	4.7	-0.56
25 yr 72 hr	N-DP-M11	5.31	4.43	-0.88
25 yr 72 hr	N-DP-M12	5.38	5.28	-0.1
25 yr 72 hr	N-DP-N10	5.12	4.63	-0.49
25 yr 72 hr	N-DP-O10	4.88	3.34	-1.54
25 yr 72 hr	N-DP-O11	4.89	3.49	-1.4
25 yr 72 hr	N-DP-P06	4.64	4.42	-0.22
25 yr 72 hr	N-DP-Y03	5.12	5.12	0
25 yr 72 hr	N-DP-Z12	4.4	4.19	-0.21
25 yr 72 hr	N-DQ-A01	4.55	3.42	-1.13
25 yr 72 hr	N-DQ-A01x	#N/A	3.78	#N/A
25 yr 72 hr	N-DQ-A02	4.56	3.43	-1.13
25 yr 72 hr	N-DQ-A03	4.55	3.2	-1.35
25 yr 72 hr	N-DQ-A03x	3.13	1.68	-1.45
25 yr 72 hr	N-DQ-A04	5.57	5.74	0.17
25 yr 72 hr	N-DQ-A05	4.36	2.46	-1.9
25 yr 72 hr	N-DQ-A06	4.55	3.38	-1.17
25 yr 72 hr	N-DQ-A07	4.55	3.43	-1.12
25 yr 72 hr	N-DQ-A08	4.55	3.47	-1.08
25 yr 72 hr	N-E01	2.93	4.4	1.47
25 yr 72 hr	N-E03	4.02	4.4	0.38
25 yr 72 hr	N-E07	4.54	4.54	0
25 yr 72 hr	N-E08	3.82	4.4	0.58
25 yr 72 hr	N-E10	3.74	4.4	0.66
25 yr 72 hr	N-E11	2.57	3	0.43
25 yr 72 hr	N-EA	1.59	4.4	2.81
25 yr 72 hr	N-EA-A01	3.86	3.85	-0.01
25 yr 72 hr	N-EA-A02	3.86	3.85	-0.01
25 yr 72 hr	N-EB	1.59	4.4	2.81
25 yr 72 hr	N-EB-A01	3.03	3.84	0.81
25 yr 72 hr	N-EC	1.59	4.4	2.81
25 yr 72 hr	N-EC-A01	3.11	3.84	0.73
25 yr 72 hr	N-ED	1.59	4.4	2.81
25 yr 72 hr	N-ED-A01	3.63	3.77	0.14

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	N-ED-A02	3.64	3.78	0.14
25 yr 72 hr	N-ED-A03	3.64	3.78	0.14
25 yr 72 hr	N-EE	1.59	4.4	2.81
25 yr 72 hr	N-EE-A01	3.71	3.87	0.16
25 yr 72 hr	N-EF	1.59	4.4	2.81
25 yr 72 hr	N-EF-A01	3.71	3.87	0.16
25 yr 72 hr	N-EG	1.59	4.4	2.81
25 yr 72 hr	N-EG-A01	3.46	3.78	0.32
25 yr 72 hr	N-EG-A02	3.66	3.77	0.11
25 yr 72 hr	N-EH	1.59	4.4	2.81
25 yr 72 hr	N-EH-A01	2.02	3.08	1.06
25 yr 72 hr	N-EI	1.59	4.4	2.81
25 yr 72 hr	N-EJ	1.59	4.4	2.81
25 yr 72 hr	N-EJ-A01	1.65	4.4	2.75
25 yr 72 hr	N-EK	1.59	4.4	2.81
25 yr 72 hr	N-EK-A01	3.76	4.4	0.64
25 yr 72 hr	N-EL	1.59	4.4	2.81
25 yr 72 hr	N-EL-A01	3.04	3.02	-0.02
25 yr 72 hr	N-EM	1.59	4.4	2.81
25 yr 72 hr	N-EM-A01	2.83	3	0.17
25 yr 72 hr	N-EM-A02	2.74	3	0.26
25 yr 72 hr	N-EM-A03	2.57	3	0.43
25 yr 72 hr	N-EN	1.59	4.4	2.81
25 yr 72 hr	N-EN-A01	2.92	2.62	-0.3
25 yr 72 hr	N-EO	1.59	4.4	2.81
25 yr 72 hr	N-EO-A01	2.46	2.76	0.3
25 yr 72 hr	N-EP	1.59	4.4	2.81
25 yr 72 hr	N-EP-A01	2.56	3	0.44
25 yr 72 hr	N-EQ	1.59	4.4	2.81
25 yr 72 hr	N-EQ-A01	1.67	4.46	2.79
25 yr 72 hr	N-ER	1.59	4.4	2.81
25 yr 72 hr	N-ES	1.59	4.4	2.81
25 yr 72 hr	N-ET	1.59	4.4	2.81
25 yr 72 hr	N-ET-A01	1.6	2.8	1.2
25 yr 72 hr	NAltAdd_01	#N/A	3.64	#N/A
25 yr 72 hr	NZA-0110	#N/A	3.09	#N/A
25 yr 72 hr	NZA-0120	#N/A	2.95	#N/A
25 yr 72 hr	NZA-0130	#N/A	2.33	#N/A
25 yr 72 hr	NZA-0150	#N/A	3.33	#N/A
25 yr 72 hr	NZA-0160	#N/A	2.58	#N/A
25 yr 72 hr	P-Added-7-DSJ	#N/A	-2.8	#N/A
25 yr 72 hr	P-Added-9-DSJ	#N/A	1.5	#N/A
25 yr 72 hr	P-BA-A01-DSJ	#N/A	3.05	#N/A
25 yr 72 hr	P-BA-D08-Added-6-DS	#N/A	-2.5	#N/A

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Area BCDE Long Range Alternatives Existing Condition Tailwater Unselected Alternative (3BC,2DE) 25-Year,72-Hour Maximum Stage Results

Sim	Node Name	Existing Maximum Stage [ft]	Alternative Maximum Stage [ft]	Difference [Alternative - Existing, ft]
25 yr 72 hr	P-BB-A01-DSJ	#N/A	2.43	#N/A
25 yr 72 hr	P-BC-A01-DSJ	#N/A	1.5	#N/A
25 yr 72 hr	P-BD-A02-DSJ	#N/A	1.27	#N/A
25 yr 72 hr	P-BE-A01-Added-1-DSJ	#N/A	2.98	#N/A
25 yr 72 hr	P-BE-A01-DSJ	#N/A	3.02	#N/A
25 yr 72 hr	P-CC-A01-DSJ	#N/A	-0.39	#N/A
25 yr 72 hr	P-CE-A01-DSJ	#N/A	-2.12	#N/A
25 yr 72 hr	P-CF-A01-DSJ	#N/A	-2.28	#N/A
25 yr 72 hr	P-CG-A01-DSJ	#N/A	2	#N/A
25 yr 72 hr	P-ED-A01-DSJ	#N/A	2.3	#N/A
25 yr 72 hr	P-EL-A01-DSJ	#N/A	1.51	#N/A
25 yr 72 hr	P-EM-A01-DSJ	#N/A	3	#N/A
25 yr 72 hr	P-EN-A01-DSJ	#N/A	1.8	#N/A
25 yr 72 hr	P-EO-A01-DSJ	#N/A	2	#N/A
25 yr 72 hr	P-EP-A01-DSJ	#N/A	3	#N/A
25 yr 72 hr	roposed-Trunkline-1-D	#N/A	2.93	#N/A
25 yr 72 hr	Pump D2 Node	#N/A	-2.08	#N/A
25 yr 72 hr	Trunkline-Junction-1	#N/A	3.24	#N/A

APPENDIX C
SUPPORTING DOCUMENTATION

Public Involvement Plan

Kimley»Horn

MEMORANDUM

To: Thomas Meyer, City of Naples, FL

From: Kellie Clark, P.E., Kimley-Horn and Associates, Inc.

Cc: Amy Wicks, P.E., Kimley-Horn and Associates, Inc.

Date: January 2022

RE: ***Naples Basin Assessments Public Involvement Plan***
City of Naples, Collier County, Florida
Kimley-Horn Project No: 048320007

PROJECT BACKGROUND

The City of Naples has selected Kimley-Horn to assess five areas within the City. As part of this project, there is a public coordination task (Task 2). This task includes creating and updating an online public engagement website, holding a public meeting within each assessment area, and a Public Involvement Plan (PIP) that defines goals and responsibilities for this task. This document is the PIP. The overall project tasks include the following tasks.

- Task 1 – Project Administration
- Task 2 – Public Coordination
- Task 3 – Data Collection and Documentation
- Task 4 – Model Recommendations and Analysis
- Task 5 – Existing Conditions Model
- Task 6 – Alternatives Analysis
- Task 7 – Future Conditions Analysis
- Task 8 – Benefit Cost Analysis
- Task 9 – Capital Improvements Prioritization and Final Report

PUBLIC INVOLVEMENT PLAN OVERVIEW

There are three main stages of public involvement for this project. The overall project schedule is attached for reference.

Stage	Tasks	Anticipated Dates	Objectives
Early	• Public Involvement Plan • Website Creation	October 2021 to March 2022	Early in the project to define goals, share general project information with the public, and gain comments on areas of concern.
Middle	• Website Updates • Public Meetings	May to August 2022	After the existing conditions modeling task to gain comments on model results, and areas of concern.
Final	• Website Updates	September to December 2022	To share final recommendations.

Goals and Objectives

The goals for the public involvement are as follows:

- Share general project information and progress with the public
- Gain public input on any known areas of flooding concern
- Gain public input on existing condition model results
- Understand general public concerns to help inform the alternatives analysis
- Share recommendations so the public is aware of potential future projects

The measurable objectives for the public involvement are as follows:

- Holding a single public meeting for each assessment area
- Providing information via a website that will be created and then updated twice during the project
- Gaining public input via both the public meeting and the website
- Considering public input throughout the project via model reviews and the decision matrix used for the capital improvements prioritization and final report

PUBLIC INVOLVEMENT PLAN COMPONENTS

The following sections discuss each of the PIP components in more detail.

Online Public Engagement Website

The online public engagement website will be created in the early stages of the project and then updated in subsequent phases. The City of Naples has created a project page located here: https://www.naplesgov.com/streetsstormwater/project/multibasin-stormwater-assessment. The City will post a link to the public engagement website on this project page. The City's project page will also be provided to stakeholders as they are contacted so they are able to access and share the public engagement website.

This public engagement website will be hosted utilizing the Kimley-Horn Public Coordinate platform. Prior to posting anything on the website, Kimley-Horn will send the content to the City of Naples for review and approval. The list below summarizes the website's anticipated capabilities for this project.

Stage	Tasks	Website Components
Early	Website Creation	• Welcome page • General project background and goals • Simple project timeline graphic • Interactive map with: o Preliminary assessment area boundaries • Capabilities for public to drop comments on known areas of flood concern with a request to include dates/amounts of flooding and pictures if available • Information that a public meeting will be held in the summer/fall

Middle	Website Updates	• Welcome page
		• General project background and goals
		• Simple project timeline graphic
		• Interactive map with:
		   o Refined assessment area boundaries
		   o Existing stormwater infrastructure pipes and inlets/manholes
		   o Existing condition model results (floodplains)
		• Capabilities for public to drop comments on known areas of flood concern with a request to include dates/amounts of flooding and pictures if available
		• Capabilities for public to comment on model results
		• Detailed information on details of public meeting

Final	Website Updates	• Welcome page
		• General project background and goals
		• Simple project timeline graphic
		• Summary of public meetings
		• Informational map with:
		   o Refined assessment area boundaries
		   o Existing stormwater infrastructure pipes and inlets/manholes
		   o Existing condition model results (floodplains)
		   o Recommended proposed layout
		   o Recommended alternative model results (floodplains)

Because the public will be capable of providing comments on the website, it is important to define how these comments will be collected and processed. The website will be set up to require a person's first and last name and email address. Comments will be reviewed and collected at the following stages:

- Prior to model calibration only to see if there are comments relevant to this task
- Prior to the public meetings for use in determining any comment themes that can be addressed through a presentation during the public meeting
- Prior to the final stage to summarize all comments received to help create a FAQ sheet or other informational material

While the comments can be pulled prior to model calibration, no action will occur besides documenting comments to date and reviewing for information relevant to calibrating the model. Kimley-Horn can send these to the City at this time, but no further action is anticipated. At the other two times, Kimley-Horn will document the comments and send to the City for review. Then, the City and Kimley-Horn will work together to consider the comments received when preparing for the public meeting and then preparing final informational documentation for the project website.

Public Meetings

Five public meetings will be held for this project, one for each assessment area. It is anticipated these meetings will occur after model results are prepared for the existing condition model. Each meeting will be held to provide information about the project to the public and gain consensus for future work. Public input will be sought to gain input on the reasonableness of the model results and to understand general concerns as the project team moves forward with analyzing alternatives.

Kimley-Horn and the City will work together to determine a date and location for each public meeting. It is anticipated that the five meetings will be staggered over a two-month period. The City will book the venue and notice the meeting via notices sent to individual property owners within the assessment area.

Once a date and location is set for the meetings, major stakeholder groups in each assessment area will be invited. For the five assessment areas, stakeholders are anticipated to be invited. The City of Naples will provide contact information for each stakeholder. Kimley-Horn will be responsible for inviting the stakeholder via the provided contact information to the public meeting.

Assessment Area	**Stakeholder Group to be Invited**
A	Park Shore and Park West
B	Old Naples
C	Old Naples and Aqualane Shores
D	River Park, CRABB D-Downtown, and NAACP
E	River Park and NAACP (west of the Gordon River)

Kimley-Horn will work with the City to determine major talking points during the presentation to the public. Public comments collected from the website will be considered when creating these major talking points. Kimley-Horn will prepare the presentation materials from project materials prepared during the duration of the project.

Kimley-Horn will lead the public meeting with assistance from City staff as needed. These meeting will follow an open house style with a short presentation followed by open stations with Kimley-Horn and City of Naples staff to help answer questions. It is anticipated the public meeting will focus on informing the public of the project background, overall goals and objectives, model results for input, and likely next steps and potential improvements (generally) for public consideration. There will be a portion of the meeting that is open for discussion with stations set up for the public to speak with Kimley-Horn and City staff and to provide comment cards.

Following the meeting, Kimley-Horn will create meeting notes that summarize each meeting and that may be shared on the project website if approved by the City.

General Communication Protocols

All information to be shared with the public including presentation materials prepared for the public meetings and information to be posted on the website will be first approved by the City of Naples prior to sharing.

If contact information is desired to be shared on the website, it will direct the public to contact the City of Naples project manager (PM).

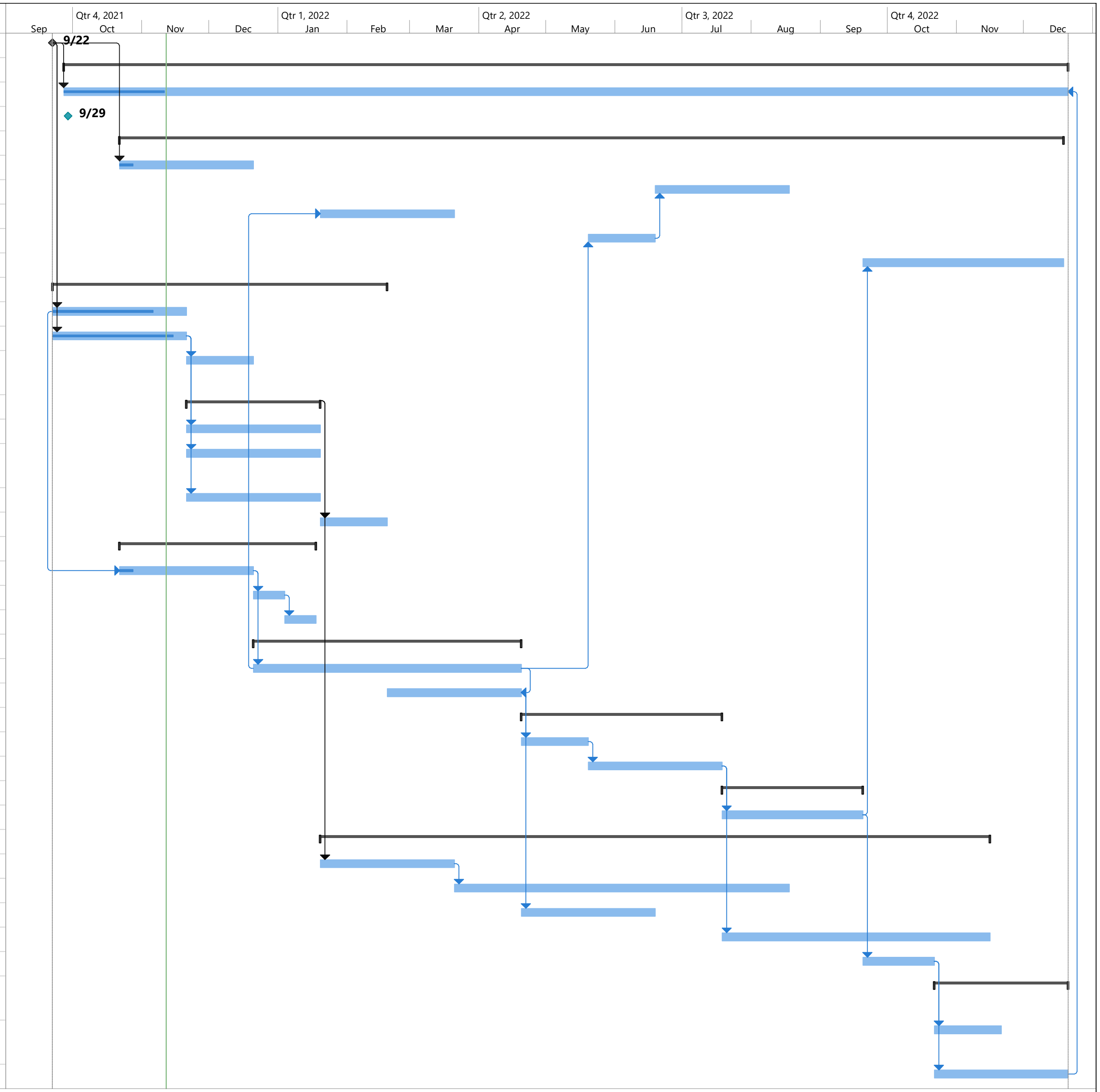
If the public reaches out directly to Kimley-Horn, Kimley-Horn will direct them to the City's PM and will only follow up with contacting the individual if directed by the City's PM.

Team Responsibilities

Public Involvement Action Item	Responsible Team Member
Public Involvement Plan	
Create Public Involvement Plan	Kimley-Horn
Review and provide feedback	City of Naples
Finalize Public Involvement Plan	Kimley-Horn
Online Public Engagement Website	
Create draft website with early-stage website components	Kimley-Horn
Review draft website and comment or approve	City of Naples
Finalize website and post publicly once approval received	Kimley-Horn
Post link to the publicly available website on the City's project site	City of Naples
Review comments for those relevant to model calibration	Kimley-Horn
Document and share comments with City	Kimley-Horn
City review comments	City of Naples

Update website with middle stage website components	Kimley-Horn
Review draft website and comment or approve	City of Naples
Finalize website and post publicly once approval received	Kimley-Horn
Document and share comments with City	Kimley-Horn
Review comments ahead of public meeting	City of Naples and Kimley-Horn
Consider public comments in public meeting content	City of Naples and Kimley-Horn
Document and share with City all public comments received on website	Kimley-Horn
Review public comments	City of Naples and Kimley-Horn
Create informational/FAQ sheet to address comments	City of Naples and Kimley-Horn
Update website with final stage website components	Kimley-Horn
Review draft website and comment or approve	City of Naples
Finalize website and post publicly once approval received	Kimley-Horn
Public Meetings	
Determine meeting locations and times	City of Naples and Kimley-Horn
Book venue	City of Naples
Send out notices to individuals within each basin	City of Naples
Invite major HOAs via an HOA board member and/or HOA president	Kimley-Horn
Prepare major talking points for the presentation	City of Naples and Kimley-Horn
Prepare presentation/public meeting materials	Kimley-Horn
Lead the public meeting	Kimley-Horn
Assist with the public meeting presentation as needed	City of Naples
Provide staff to be available to answer one-on-one public comments	City of Naples and Kimley-Horn
Create meeting notes summarizing each meeting	Kimley-Horn

ID	Task Name	Start	Finish
1	Notice to Proceed	9/22/21	9/22/21
2	**1. Project Management**	**9/26/21**	**12/20/22**
3	Project Management and QA/QC	9/26/21	12/20/22
4	Project Kickoff Meeting	9/29/21	9/29/21
5	**2. Public Relations**	**10/22/21**	**12/19/22**
6	Public Involvement Plan	10/22/21	12/21/21
7	Public Meetings	6/19/22	8/18/22
8	Website Creation	1/20/22	3/21/22
9	Website Updates	5/20/22	6/19/22
10	Website Updates	9/20/22	12/19/22
11	**3. Data Collection**	**9/22/21**	**2/19/22**
12	Obtain Existing Data	9/22/21	11/21/21
13	Preliminary Basins and Data Gaps Analysis	9/22/21	11/21/21
14	City Review of Data Gaps and provide missing available data	11/21/21	12/21/21
15	**Field Work**	**11/21/21**	**1/20/22**
16	Field Visits	11/21/21	1/20/22
17	Survey services (field verification and survey data gaps)	11/21/21	1/20/22
18	Soils exploration (if needed)	11/21/21	1/20/22
19	Data collection deliverable	1/20/22	2/19/22
20	**4. Model Recommendations and Analysis**	**10/22/21**	**1/18/22**
21	Analysis and Technical Memorandum	10/22/21	12/21/21
22	City Review	12/21/21	1/4/22
23	Finalize Technical Memorandum	1/4/22	1/18/22
24	**5. Existing Conditions Model**	**12/21/21**	**4/20/22**
25	Basin Refinement and Model Development	12/21/21	4/20/22
26	Model calibration and verification	2/19/22	4/20/22
27	**6. Alternatives Analysis**	**4/20/22**	**7/19/22**
28	Sensitivity Analysis	4/20/22	5/20/22
29	Alternatives Analysis	5/20/22	7/19/22
30	**7. Future Conditions Analysis**	**7/19/22**	**9/20/22**
31	Future Conditions Analysis	7/19/22	9/20/22
32	**8. Benefit Cost Analysis**	**1/20/22**	**11/16/22**
33	Benefits Estimation Initial Setup (ICF Task)	1/20/22	3/21/22
34	Hedonic Modeling (ICF Task)	3/21/22	8/18/22
35	Benefits Estimation (ICF Task)	4/20/22	6/19/22
36	Benefits Estimation (ICF Task)	7/19/22	11/16/22
37	Final Alternatives, Layout, and OPC	9/20/22	10/21/22
38	**9. Capital Improvements Prioritization and Final Report**	**10/21/22**	**12/20/22**
39	Funding Consideration and Capital Improvements Plan	10/21/22	11/20/22
40	Final Report	10/21/22	12/20/22



Project: Naples Basin Assessme
Date: 11/12/21

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	

Model Recommendation Technical Memorandum

TECHNICAL MEMORANDUM

To: Eddie Bliss, P.E., City of Naples, FL

From: Kellie Clark, P.E., Kimley-Horn and Associates, Inc.

Cc: Amy Wicks, P.E., Kimley-Horn and Associates, Inc.
Andy Holland, P.E., City of Naples, FL

Date: January 2022; revised May 2022

RE: ***Naples Basin Assessments DRAFT Model Recommendations***
City of Naples, Collier County, Florida
Kimley-Horn Project No: 048320007

PROJECT BACKGROUND

The City of Naples has selected Kimley-Horn to assess five areas within the City. An existing condition model will be developed. Additionally, a future condition model will be developed that will consider items such as future development, changes to storm intensities, and sea level rise. As there are many ways these items may be applied in a model, the project includes a model methodology task to review and analyze available data and make recommendations for several items. This task is included ahead of modeling so that the recommendations included in this document, once approved, can serve as the basis during model development. The following lists the items to be reviewed and analyzed:

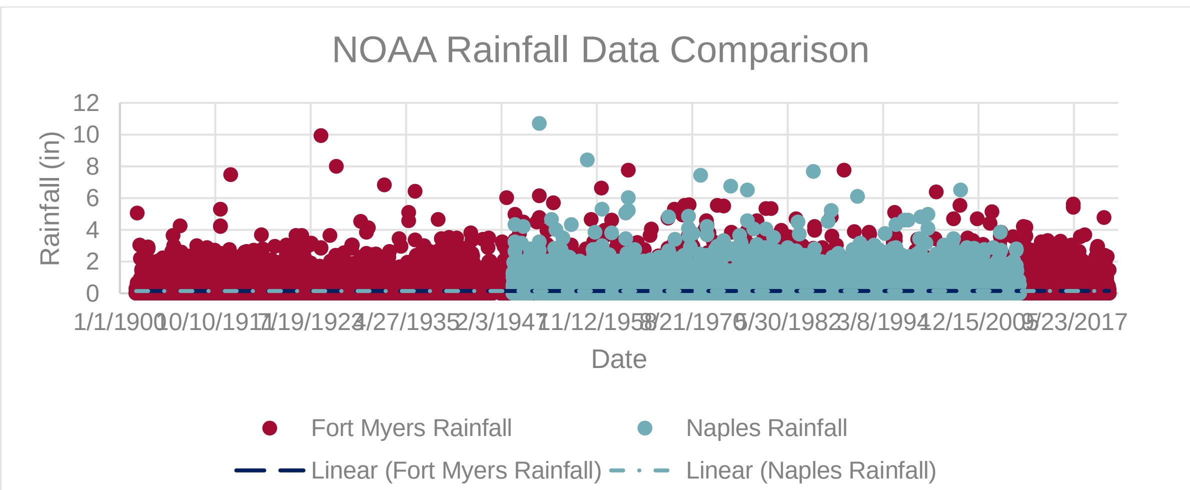
- **Design Storm Intensities**
  - Design storm intensities for the 10-year 1-hour and 25-year 3-day design storms. It is anticipated that one design storm intensity for present day will be recommended and utilized for both the existing condition and future condition models.
- **Boundary Conditions**
  - Existing sea level for the existing condition model tailwater
  - Sea level rise and desired planning horizon for future tailwater
  - Model boundary conditions along non-waterway assessment area boundaries
- **Future Land Use**
  - Future land use for consideration in infiltration calculations, runoff, and stage-area calculations
- **Groundwater Levels**
  - Existing groundwater levels for consideration in infiltration calculations
  - Future groundwater levels for consideration in infiltration calculations
- **Level of Service**
  - Target level of service (anticipated to be no flooding at crown of road during 25-year 72-hour or the 10-year 1-hour design storm)

The sections of this document are broken into those items listed above and explain the analysis and recommendation for each item. All elevations in this report are in NAVD88.

DESIGN STORM INTENSITIES

To make a recommendation of the design storm intensities for existing and future conditions, the historical rainfall data from South Florida Water Management District (SFWMD) Rain Gauges and National Oceanic and Atmospheric Administration (NOAA) was obtained. The SFWMD historical rainfall data was pulled from stations COLGOV_R, COCO1_R, D28_R, and FDMPARK. SFWMD reports rainfall totals on 15-minute intervals and only goes back as far as the year 2007. The NOAA data was pulled from Fort Myers Page Field Airport (USW0002835) and Naples (USC00086078) stations that report daily rainfall totals. The data from the Page Field airport and Naples stations go back as far as the year 1892 and 1942, respectively.

Since the intent of this task is to understand trends, having a long record of data was an important consideration. The longest period of record occurred at the NOAA Page Field station. However, this station is located approximately 30 miles away from Naples. The data from the two NOAA stations were reviewed. The trend lines were plotted and found to be near identical. With the NOAA Page Field station having more than 60 more years of data, it was determined that it was advantageous to use this station's data to determine trends and the Page Field station was used for the subsequent analyses.



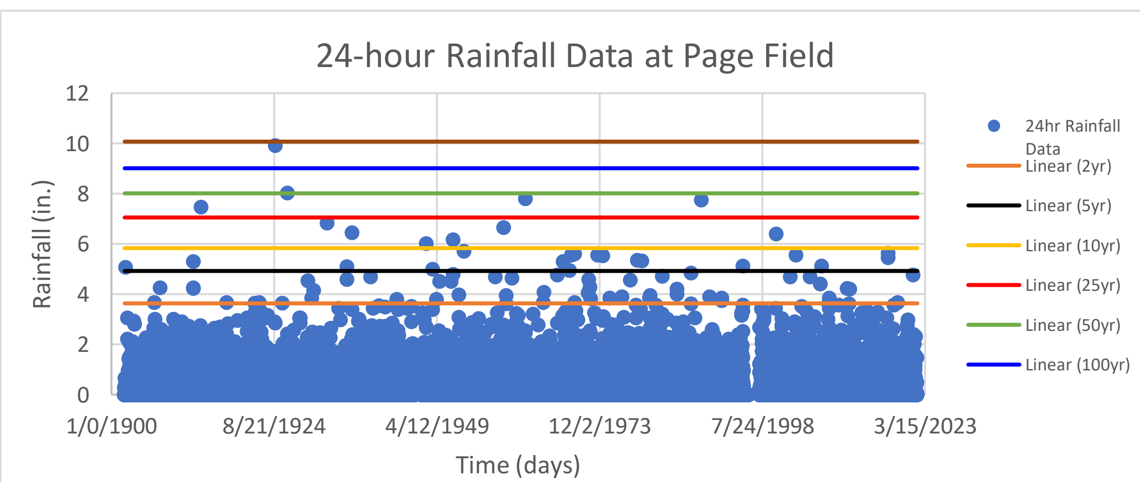
Because many processes in hydrology are inherently random, such as rainfall, statistical methods are necessary to organize, present, and reduce observed data to a form that is reasonable to analyze. For the purposes of this task, a frequency analysis was performed using the NOAA Page Field data. The data was first plotted to determine if a linear or logarithmic fit was better. It was determined a log function was a better fit, and as such, the Log Pearson Type 3 Distribution was used to perform the frequency analysis.

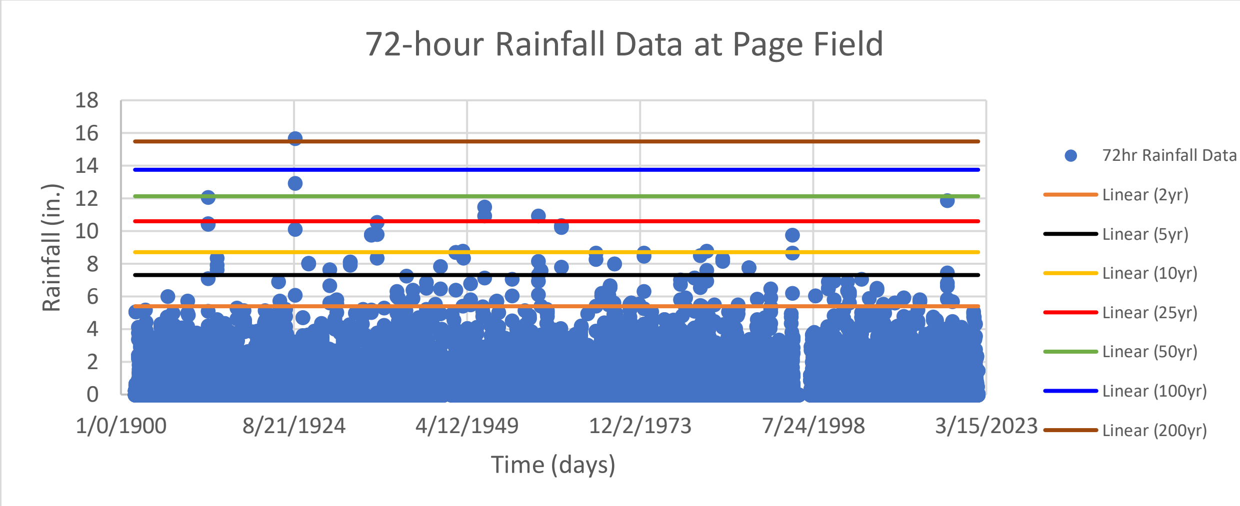
The daily rainfall data was cumulatively summed to find the 72-hour rainfall totals over the entire data period. Rolling yearly rainfall averages, maximums, and minimums were calculated for the 24-hour and 72-hour durations.

The log of the data was taken and the overall mean, stand deviation, and skew were calculated. From there, a factor for each storm frequency was determined and the resulting rainfall amount for different storm frequencies (2-year, 5-year, 10-year, 25-year, 50-year, 100-year, and 200-year) was calculated. It should be noted that the logarithmic trendline was a good fit for the overall data, except at the ends of the data set. As such, the intent of this analysis was not to set the values for each storm but was useful in looking for trends.

Fort Myers data was analyzed for three different time intervals: overall, 40-year periods, and 10-year periods to see if there were obvious trends over time. The results of the analysis for years 1902 to 2021 is included below for both the 24-hour and 72-hour storm events. Additionally, the resulting elevations were plotted with the gauge data for reference.

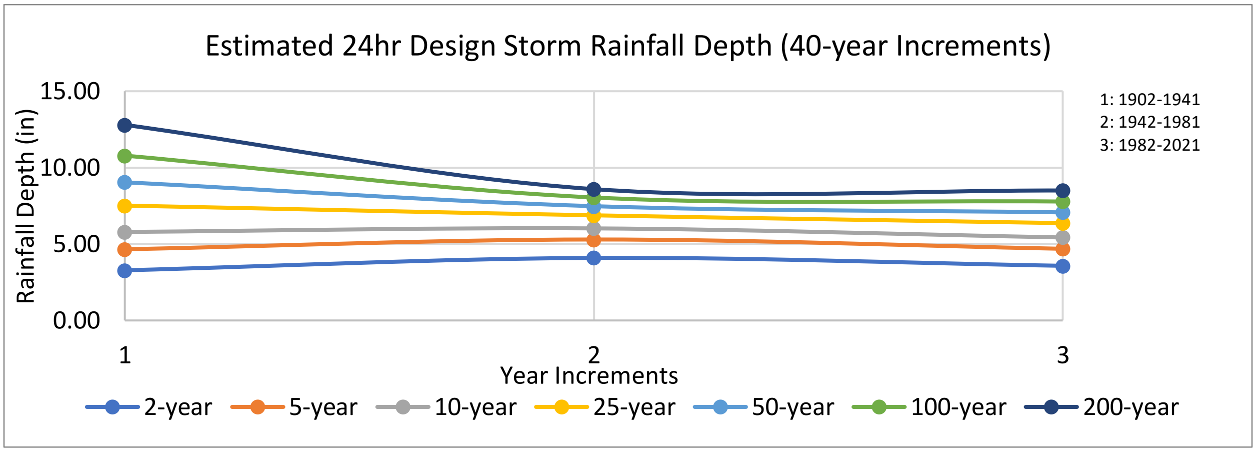
		24hr Duration Storm Rainfall Depth (in)	**72hr Duration Storm Rainfall Depth (in)**
		1902-2021	1902-2021
Frequency	2	3.63	5.40
	5	4.92	7.31
	10	5.83	8.71
	25	7.05	10.60
	50	8.01	12.13
	100	9.01	13.75
	200	10.07	15.48



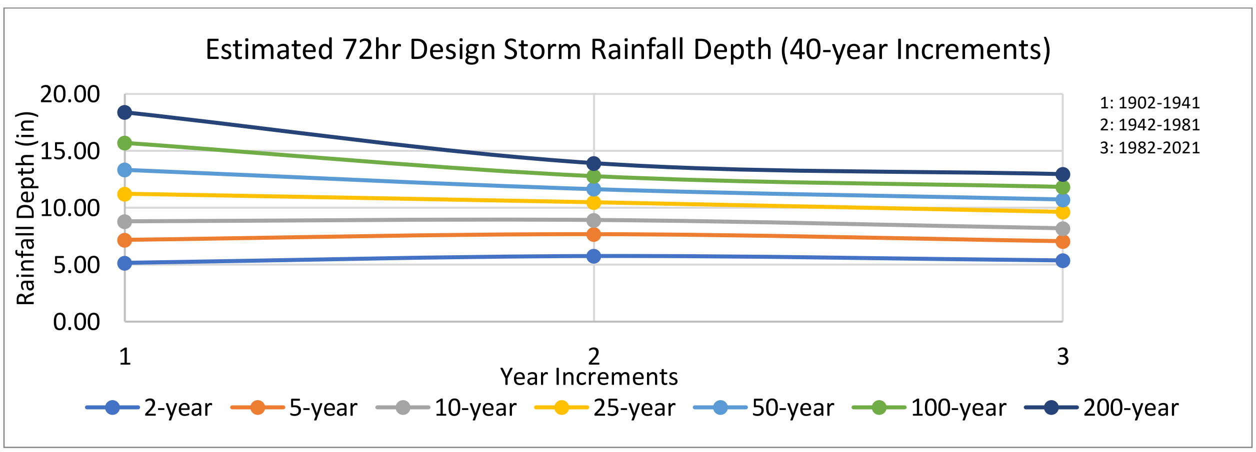


The data was then analyzed in three 40-year periods and the results of this analysis are included below for both the 24-hour and 72-hour storm events.

		24hr Duration Storm Rainfall Depth (in)		
		First 40 Years	Middle 40 Years	Last 40 Years
		1902-1941	1942-1981	1982-2021
Frequency	2	3.28	4.10	3.58
	5	4.66	5.30	4.69
	10	5.79	6.03	5.43
	25	7.52	6.88	6.37
	50	9.04	7.48	7.07
	100	10.79	8.05	7.78
	200	12.80	8.59	8.50

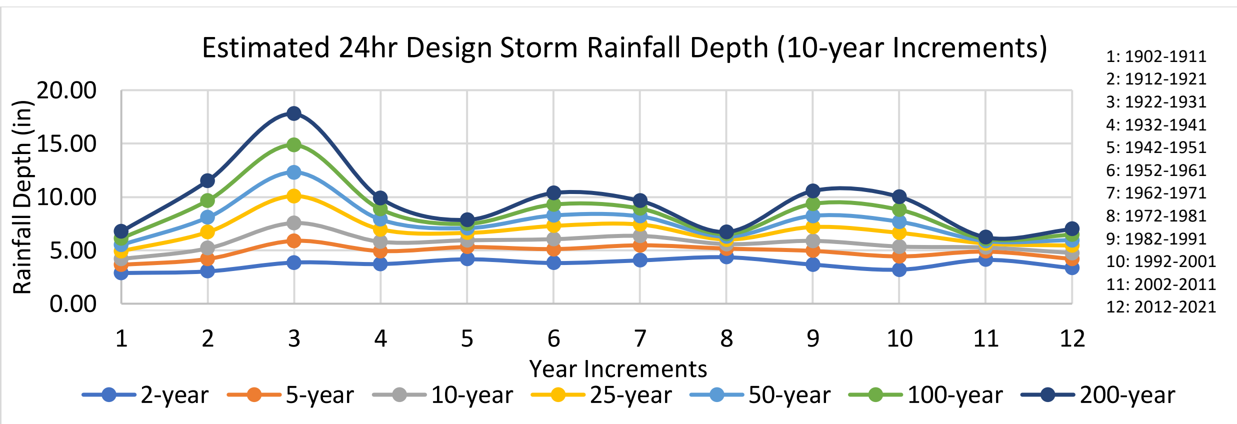


		72hr Duration Storm Rainfall Depth (in)		
		First 40 Years	Middle 40 Years	Last 40 Years
		1902-1941	1942-1981	1982-2021
Frequency	2	5.17	5.76	5.38
	5	7.19	7.68	7.07
	10	8.81	8.93	8.20
	25	11.23	10.49	9.65
	50	13.33	11.64	10.73
	100	15.70	12.78	11.83
	200	18.39	13.92	12.96

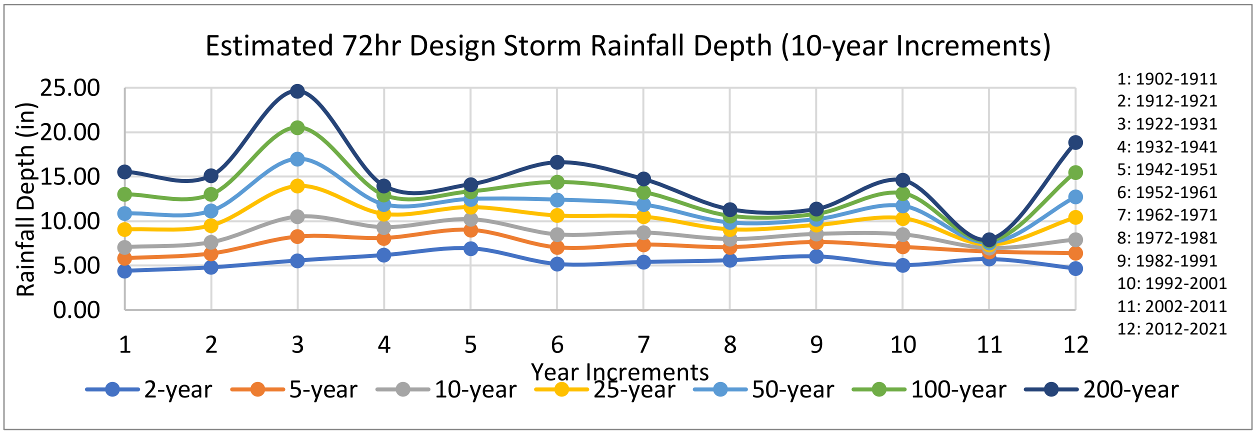


The data was then analyzed in twelve 10-year periods and the results of this analysis are included below for both the 24-hour and 72-hour storm events.

		24hr Duration Storm Rainfall Depth (in)											
		1902-1911	1912-1921	1922-1931	1932-1941	1942-1951	1952-1961	1962-1971	1972-1981	1982-1991	1992-2001	2002-2011	2012-2021
Frequency	2	2.87	3.03	3.85	3.71	4.16	3.81	4.05	4.35	3.66	3.18	4.10	3.34
	5	3.64	4.19	5.89	4.93	5.30	5.12	5.47	5.17	4.94	4.43	4.88	4.20
	10	4.19	5.18	7.55	5.80	5.94	6.04	6.35	5.58	5.88	5.35	5.26	4.75
	25	4.92	6.71	10.09	6.96	6.63	7.28	7.42	6.02	7.18	6.64	5.64	5.45
	50	5.50	8.07	12.31	7.88	7.08	8.26	8.18	6.28	8.23	7.68	5.87	5.96
	100	6.11	9.66	14.86	8.84	7.49	9.29	8.92	6.52	9.35	8.80	6.06	6.47
	200	6.76	11.51	17.78	9.86	7.85	10.37	9.64	6.72	10.55	10.01	6.22	6.98



		72hr Duration Storm Rainfall Depth (in)											
		1902-1911	1912-1921	1922-1931	1932-1941	1942-1951	1952-1961	1962-1971	1972-1981	1982-1991	1992-2001	2002-2011	2012-2021
Frequency	2	4.41	4.80	5.57	6.18	6.95	5.18	5.40	5.60	6.04	5.06	5.74	4.68
	5	5.82	6.36	8.27	8.11	9.02	7.05	7.37	7.08	7.66	7.11	6.58	6.39
	10	7.08	7.63	10.51	9.32	10.22	8.51	8.72	7.98	8.56	8.51	6.98	7.93
	25	9.06	9.52	13.96	10.81	11.58	10.63	10.50	9.07	9.56	10.33	7.36	10.42
	50	10.87	11.16	17.02	11.89	12.50	12.42	11.87	9.85	10.22	11.72	7.59	12.74
	100	13.01	13.01	20.56	12.93	13.35	14.41	13.28	10.60	10.81	13.14	7.78	15.51
	200	15.55	15.12	24.65	13.98	14.15	16.62	14.74	11.33	11.36	14.60	7.94	18.85



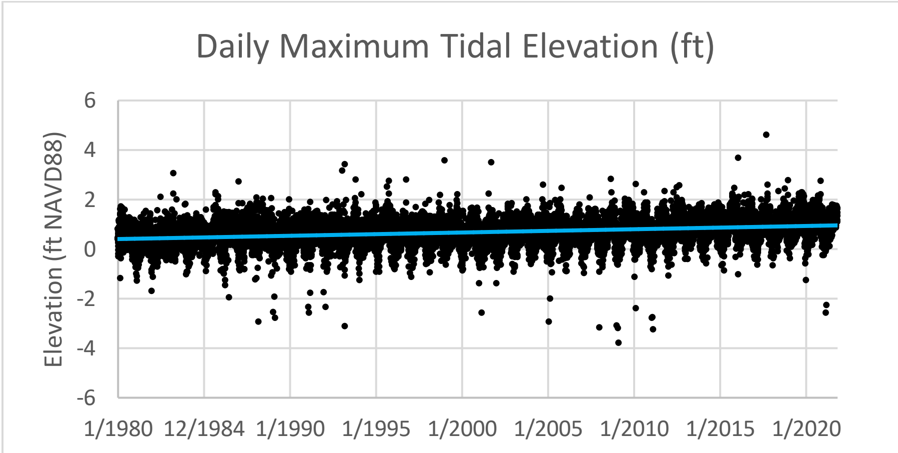
Based on the analyzed data, the conclusion was made that other than the cyclical rainfall trends, there are no other clear trends across the data to justify a recommendation for changes to be made in a future condition model. It is recommended that NOAA rainfall depth applied to the Florida Modified and SFWMD 72-hour rainfall distributions, for the 24-hour and 72-hour storms respectively for both the existing and future condition. These rainfall depths are the highest values out of the raw rainfall data analysis, published SFWMD rainfall depths, and published NOAA rainfall depths reviewed.

BOUNDARY CONDITIONS

Tidal Tailwater

All assessment areas being modeled outfall to the Gordon River, Doctors Bay, or the Venetian Bay. All of these waterbodies are tidally influenced. As such, it is important to understand the value to be modeled as the downstream boundary condition, or tailwater, within the model. To do this, available tidal data was reviewed.

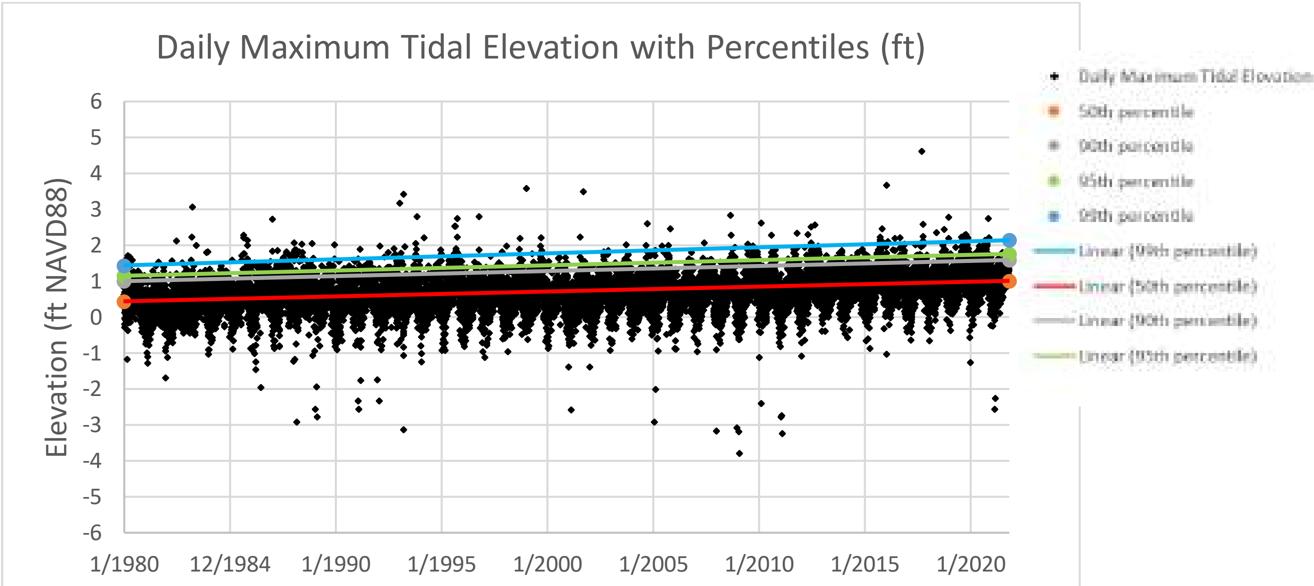
There is a tidal gauge located in Naples that was used for this analysis, NOAA Station 8725110 Naples. Verified high tide and low tide elevations available between January 1, 1980 and October 31, 2021 were downloaded and used for this analysis. High tide and low tide each generally occur twice a day. The highest value that occurred each day, also known as the higher high tide since it is the higher of the two high tides, was determined by taking the daily maximum of all the verified values. The higher high tide or the daily maximum tidal elevation recorded was then graphed and a trendline was added to the graph.



There was a noticeable trend up in the data. It is also worth noting, this data includes clear outliers. For the dates of some of the highest data values, we confirmed these corresponded to a large storm event and are therefore likely due to storm surge. There are also higher than average high tides that are likely due to King Tides. By looking at the daily maximum, both King Tides and elevations due to storm events were considered.

The next step we took was ranking the available data and determine the tidal elevation by percentile. Outliers were included in this ranking. Because it is likely that surge will occur during large storm events, it is reasonable to include these data points when ranking the tidal data. Because of the noticeable trendline, the percentiles of the first 5 years of data pulled (January 1, 1980 to December 31, 1984), the last 5 years (November 1, 2016 to October 31, 2021), and all of the data (January 1, 1980 to October 31, 2021) were determined. The results of this analysis are included below. The difference between the first 5 years and last 5 years of data is approximately 0.6 feet.

		Tidal Elevation (ft)			Differences (ft)		
Percentile	**Percent Chance**	**First 5 Years**	**All Data**	**Last 5 years**	**Last - First**	**All - First**	**Last - All**
50%	50%	0.44	0.69	1.01	0.57	0.25	0.32
80%	20%	0.81	1.09	1.39	0.58	0.28	0.30
90%	10%	1.00	1.31	1.59	0.59	0.31	0.28
95%	5%	1.15	1.49	1.76	0.61	0.34	0.27
99%	1%	1.44	1.86	2.14	0.70	0.42	0.28
99.5%	0.5%	1.62	2.04	2.26	0.64	0.42	0.22
99.9%	0.1%	2.24	2.62	2.78	0.54	0.38	0.16
				Average	0.60	0.34	0.26



Through discussion with the City, it has been determined that the 90th percentile data value from the last 5 years, which is 1.59 ft, will be used as the existing tailwater. This equates to there being a ten percent chance of the tide occurring in the last 5 years. Because this is daily data, that would mean in those 5 years, a tide of greater or equal value to 1.59 feet would have occurred as the higher high tide at approximately 183 days. This would be used as a fixed value throughout the duration of every existing conditions storm to be modeled.

Sea Level Rise and Desired Planning Horizon

For the purposes of this task, we would recommend assuming that the infrastructure will be replaced as part of this project over the next 10-20 years. For this task, we estimated 20 years to place the projects in the ground. Estimated life spans of potential infrastructure upgrades were reviewed to help facilitate decision-making on a reasonable planning horizon. Considering typical lifespans of asphalt (15-25 years), pumps (30+ years), and pipes and stormwater structures (50 years), pipes and stormwater infrastructure have the longest potential lifespan. Stormwater infrastructure therefore is recommended to be considered in the planning horizon. Considering an estimated 50-year lifespan and the 20-year implementation phase, we recommend using 70 years as the planning horizon, or approximately year 2090.

Infrastructure Lifespan + Time to Implement All Projects = Planning Horizon

50 years + 20 years = 70 years = Planning Horizon

Current year + Planning Horizon = Future Planning Year

2022 + 70 years = ~2090 = Future Planning Year

Sea level rise estimates were pulled from the US Army Corps of Engineers (USACE) Sea Level Change Curve Calculator based on the 2017 NOAA rates at the Naples gauge. It is typical to select a curve between intermediate-low to high as a means to provide the range of risk. For year 2090, this would result in future median sea levels between 1.01 and 6.36 feet.

For the purposes of this analysis, we selected the intermediate curve. The 2090 intermediate sea level rise curve yields a median elevation of approximately 2.65 ft NAVD.

The curve also shows the 2020 median elevation would be -0.11 feet. Using the difference between these two, we are able to calculate the predicated change in sea levels (or sea level rise) for this time period.

2020 Mean Sea Level = -0.11 feet

2090 Mean Sea Level = 2.65 feet

Approximate Change in Sea Level = 2090 Mean Sea Level – Mean Sea Level

2.65 feet – (-0.11 feet) = 2.65 + 0.11 = 2.76 feet of sea level rise

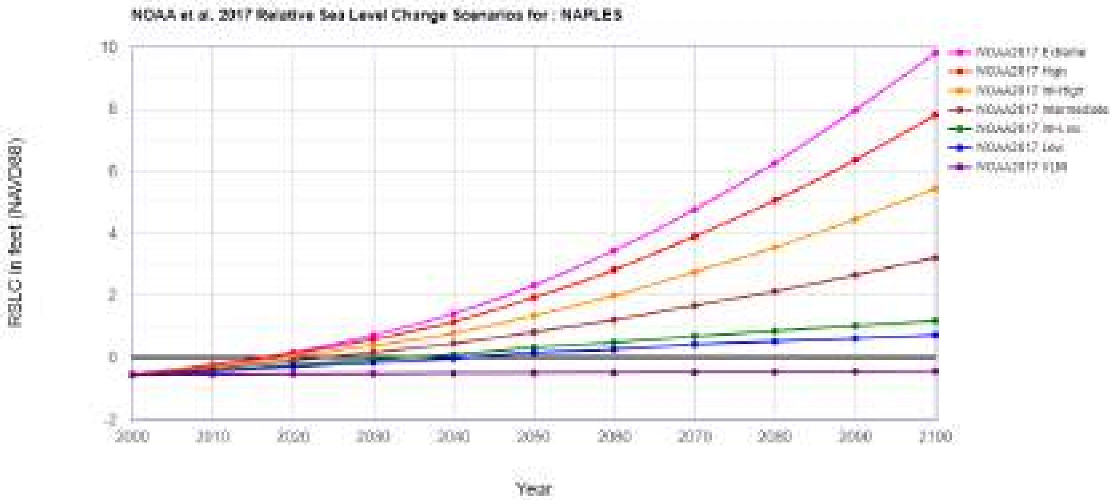
Note, this is the median sea level. As described in the Tidal Tailwater section of the report, the maximum daily tidal values (or high tides) can be much higher than this value on a typical basis. As such, we recommend adding the change in sea level to the existing tailwater to determine the recommended future condition tailwater.

Existing Tailwater = 1.59 feet

Future Recommended Tailwater = Existing Tailwater + Change in Sea Level

1.59 feet + 2.76 feet = 4.35 feet

We recommend rounding this and using 4.4 feet as the tailwater in the future conditions model.



Naples Basin Assessment
Scenarios for NAPLES
NOAA2017 VLM: 0.00110 feet/yr
All values are expressed in feet

Year	NOAA2017 VLM	NOAA2017 Low	NOAA2017 Int-Low	NOAA2017 Intermediate	NOAA2017 Int-High	NOAA2017 High	NOAA2017 Extreme
2000	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57	-0.57
2010	-0.56	-0.47	-0.44	-0.37	-0.30	-0.24	-0.24
2020	-0.54	-0.30	-0.24	-0.11	0.02	0.12	0.15
2030	-0.53	-0.17	-0.08	0.15	0.38	0.58	0.71
2040	-0.52	-0.04	0.09	0.45	0.78	1.14	1.40
2050	-0.51	0.15	0.32	0.81	1.34	1.93	2.32
2060	-0.50	0.25	0.48	1.20	1.99	2.81	3.44
2070	-0.48	0.42	0.68	1.66	2.75	3.89	4.75
2080	-0.47	0.52	0.84	2.12	3.63	5.04	6.26
2090	-0.46	0.61	1.01	2.65	4.45	6.36	7.96
2100	-0.45	0.71	1.17	3.21	5.44	7.80	9.80
2120	-0.43	0.88	1.47	3.96	6.95	10.59	13.93
2150	-0.39	1.07	1.93	5.70	10.36	16.33	21.64
2200	-0.33	1.34	2.68	8.91	17.48	28.27	36.80

Non-waterway Boundary Conditions

Boundary conditions represent locations in a model where water flows into or out of the model region (or basins) due to external factors. Along waterways, tidal data is available to set these boundary conditions and were defined earlier in this memorandum. In other locations, where water may flow into or out of the modeled basins, permitting information or other gauge data could be used to help define these boundary conditions. The challenge with this approach is to reasonably approximate and define time to peak and the overall peak elevations under different design storms.

Based on the large areas that are interconnected with our assessment areas, instead of setting boundary conditions for these locations, we recommend expanding the model to include these areas. The goal of this expansion would be to better capture the timing and amount of runoff at critical points that are interconnected with our assessment area. These expanded model areas would then be to a much less refined model scale, mainly focused on key points. The results would not and should not be used to capture the detailed hydraulics of the system or for floodplain mapping. It is anticipated that this approach will result in reasonable estimates than utilizing the data that is available, which is limited.

FUTURE LAND USE

Existing Infiltration Methodology

The Curve Number (CN) method is an empirical surface runoff method developed by the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) (formerly the Soil Conservation Service) to estimate runoff and infiltration. The TR-55 Urban Hydrology for Small Watersheds document provides runoff curve numbers for different land use and soil types.

Within ICPR4, percent impervious and the percent of directly connected impervious area (DCIA) can be assigned. If these are used, then impervious areas should be excluded from the curve numbers and curve numbers would be representative of the pervious areas only. Percent impervious is defined as the total percentage of impervious area for the corresponding land cover zone. DCIA encompasses those impervious areas that are directly connected to a basin's outfall. Runoff flows along DCIAs without passing over any pervious areas (e.g. roof to driveway to curb and gutter to storm sewer to detention pond).

Percent impervious, DCIA, and pervious area curve numbers will be assigned within the model. The percent impervious and DCIA will be set on land use categories. Pervious curve numbers will be set based on soils categories and "good condition" land cover as defined in the TR-55 document.

Land Use

As discussed above, soils and land use are the basis of infiltration and runoff calculations. NRCS soil categories will be used to input curve numbers. Soils are assumed to remain the same into the future. As such, changes in land use are what is most impactful to future infiltration and runoff calculations. Future land use was compared to existing land use to determine if there were changes that warranted changes to the modeled percent impervious and DCIA in the future conditions.

An existing land use shapefile was obtained from the Florida Department of Environmental Protection, and a future land use shapefile was provided by the City of Naples. The shapefiles were intersected to determine which areas will change. The changes can be seen in **Exhibits E1 through E5** for a side-by-side comparison of the existing land use versus future land use.

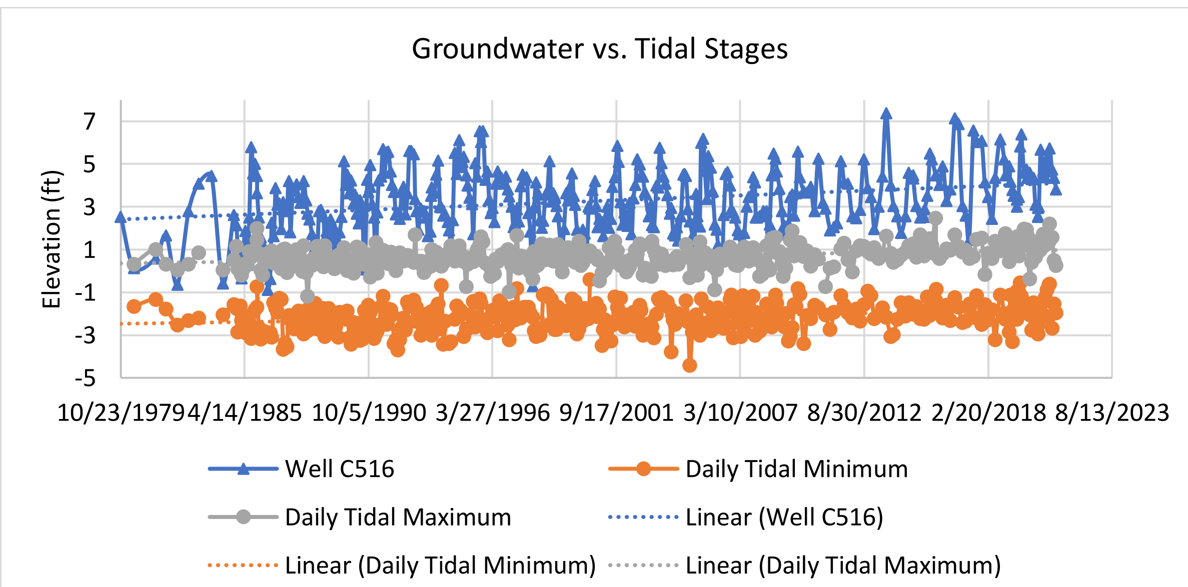
During comparison it was noted that in each assessment area, except area E, the land use classifications were made less dense from existing to future conditions. For example, in area A most of the land use is reclassified from medium density residential to low density residential. Within assessment areas A through D, the future land use classification results in a net decrease in allowable impervious compared to the existing classification. This decrease in allowable impervious will result in smaller amounts of stormwater runoff and underestimate the actual amount of runoff. Using the existing land use classifications for assessment areas A through D will be a conservative approach to the amount of impervious area and reasonably represent actual stormwater runoff conditions. Because of these changes it is recommended that the existing land use classifications be used in both the existing conditions assessment and future conditions assessment for all assessment areas except area E. In assessment area E, it is recommended to utilize the future land uses classifications for both the existing conditions model and the future conditions model. The existing land use layer shows that a section of the assessment area is currently listed as open space; however, in the aerial there is a development visible in that location that matches the commercial future land use designation. The correction is made in the future land use layer-changing that section from open space to commercial, but since that section is already built it is reasonable to consider that section as commercial in the existing conditions model. The changes from existing to future land use classifications within this assessment area result in a net increase in allowable impervious area.

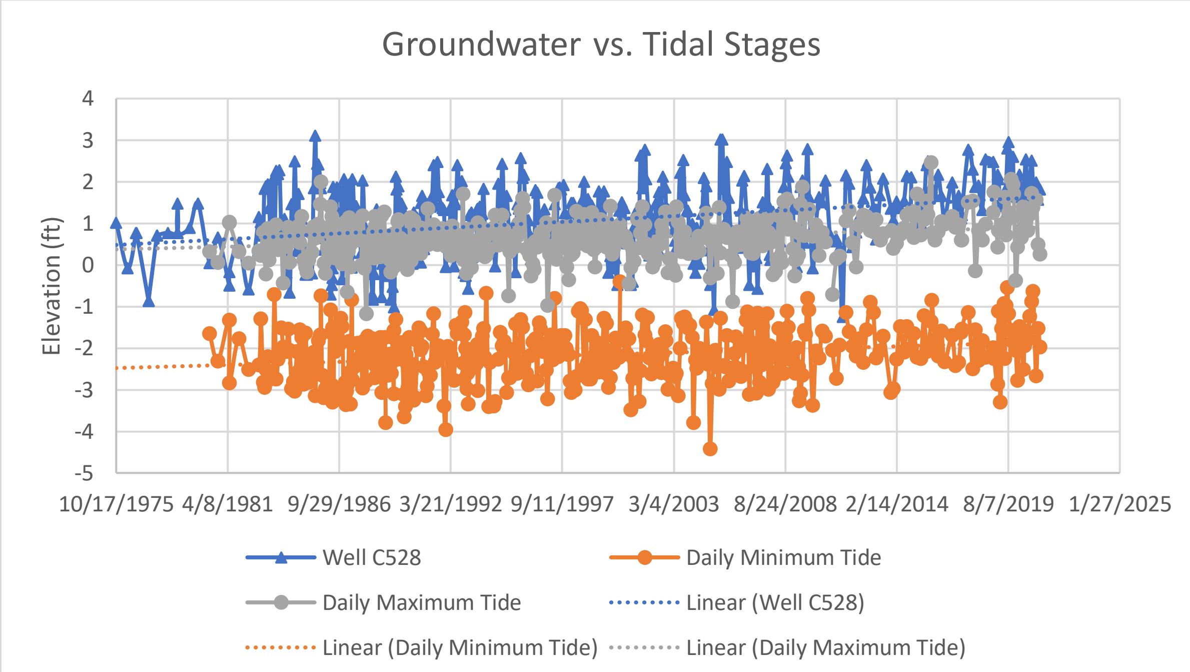
Since the land use between existing conditions and future conditions is not changing there is no anticipated change in stage area calculations or infiltration between the existing and future conditions.

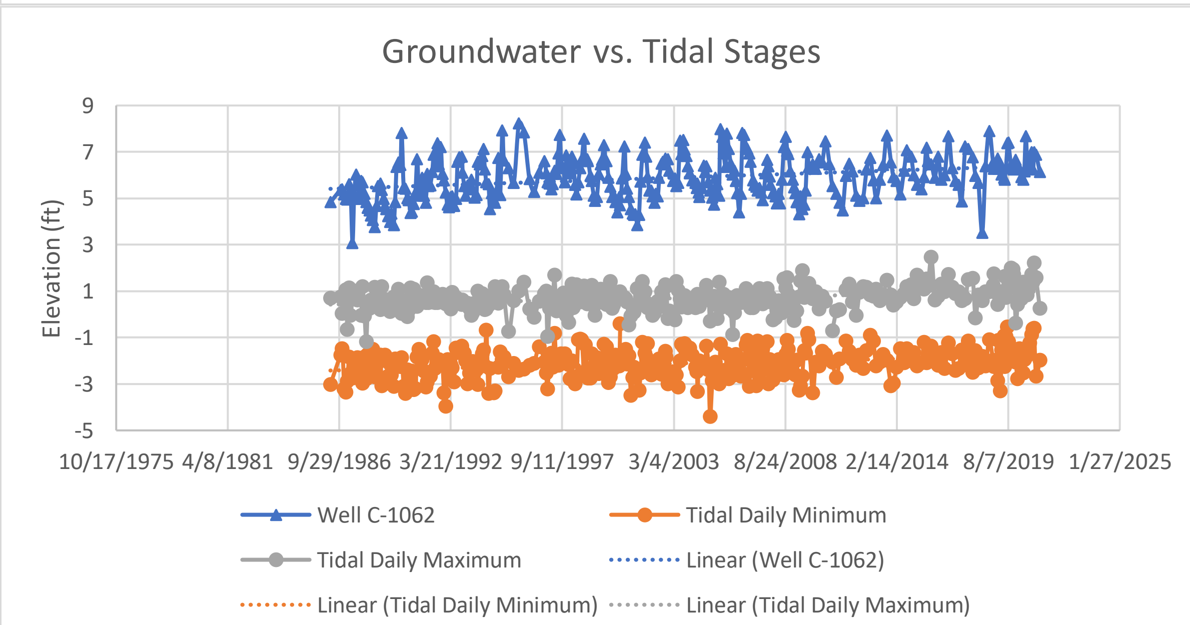
GROUNDWATER LEVELS

Existing Groundwater Levels

To better understand the hydrogeology of the area, groundwater data was reviewed. Available groundwater elevation data was obtained from the SFWMD DBHydro database for the groundwater wells in the area (stations C-516, C-528, and C-1062). A map of the groundwater well locations is attached. The well data points were grab samples at random intervals throughout the year. Because of the frequency and randomness of the data, the data was unable to be used to understand how the groundwater was affected by the tide short term (i.e. if a sinusoidal shape was present daily as it exists in tidal data). Next, daily data was obtained from the tidal NOAA Station 8725110 Naples. The groundwater elevations were compared to the tidal minimum and maximum for the day.







Two observations can be made from the graphed data. The first is that there is a difference between tidal elevations and groundwater elevations, with the differences being the least in the well closest to a tidal waterbody. The second observation is that there appears to be a trend in the groundwater data indicating rising elevations over time. It is important to be mindful, however, that due to the randomness of the data, the time of year that the random samples were taken could also contribute to any trends. However, given the trend is consistent with the tidal data trends, it is likely that the existing groundwater data does appear to be tidally influenced and that it has been affected by sea level rise due to the karst soil types.

Groundwater and Infiltration Calculations

There are multiple ways groundwater elevations affects stormwater calculations. First, groundwater elevations indicate the amount of available soil storage and therefore affect the amount of runoff versus infiltration that will occur. Additionally, they indicate the water surface elevation during normal wet season conditions. In a model, that translates to the use in infiltration calculations and initial model stages.

As it relates to infiltration calculations, NRCS soils data is being used as the basis of the pervious curve number calculations. Because curve number is being used, these will be based on soil classification categories. Most of the assessment area is classified as “Water, Urban Land” rather than a typical “A”, “A/D”, “B”, etc. soil categories. For this classification category, we will use the most conservative curve numbers – Type D. Because this is, we do not recommend any changes to the assigned infiltration values under future conditions.

Initial Stages

The other component of the model affected by groundwater is initial stages. We have recommended sea level rise will be included in the future condition boundary conditions. We also recommend updating initial stages in the model to reflect the raised tailwater in submerged systems. This will then account for sea level rise for the portions of the model that are submerged (i.e. where pipe inverts are lower than the tailwater boundary condition).

Where the pipe system is higher than the tailwater, the initial stages will be based on controlling elevations such as pipe inverts. This may or may not be reflective of the groundwater elevation. We do not suggest modifying these in the future conditions for model stability reasons. Setting it to this condition means the model will start in static condition. If changed, the water would be immediately flushed through the model, causing computational errors and/or model instabilities with little to no change to modeled results.

LEVEL OF SERVICE

Target level of service standards of no flooding at the crown of the road during 25-year, 72-hour and 10-year, 1-hour storm events was requested the City of Naples. A review was completed of surrounding codes and ordinances and this was determined to be reasonable target level of service requirements as this is at or above other local codes and ordinances. These standards will be used in both the existing and future conditions.

Sensitivity Analysis Technical Memorandum

Kimley»Horn

SENSITIVITY ANALYSIS MEMORANDUM

To: Eddie Bliss, City of Naples, FL

From: Kellie Clark, P.E., Kimley-Horn and Associates, Inc.

Cc: Bob Middleton, City of Naples, FL

Date: November 2023

RE: ***Naples Basin Assessments Sensitivity Analysis Conclusions***
City of Naples, Collier County, Florida
Kimley-Horn Project No: 048320007

TASK BACKGROUND

The City of Naples has selected Kimley-Horn to assess five areas within the City. An existing conditions model was developed, and recommendations will be made by Kimley-Horn to alleviate flooding issues. In preparation for selecting and proposing alternatives, a sensitivity analysis was conducted per Task 6.1 of the Naples Multi-Basin Stormwater Assessments to better understand the effects modifying existing infrastructure has on the performance of the stormwater drainage system.

UPSIZING PIPE SYSTEMS

To test how sensitive the existing model was to upsizing infrastructure and by how much, the following models were ran:

- **Upsize All Pipes by 6in**
- **Upsize All Pipes to 60in**
- **Double Count Drop Structures**
- **Upsize All Pipes to 60 in, Replace South pumps with 8' gravity. No tailwater**

Additionally, understanding it may not be as cost effective to upsize all pipes, the following models were ran:

- **Upsize All Major Trunklines by 6in**
- **Upsize Major and Minor Trunklines by 6in**
- **Upsize Major Trunklines to 60in**
- **Upsize Major and Minor Trunklines to 60in**

The following observations of results and subsequent conclusions were drawn:

- A review of the gravity fed systems without pumps shows benefit in all scenarios. However, in systems with pumps, there was close to no change in results. Therefore, in a gravity-fed system, upsizing pipes is more effective than in systems served by a pump.

- There are areas to justify upsizing certain pipes instead of upsizing all pipes due to specific pipes being restrictive in a given pipe system.

- In some areas it was ineffective to solely upsize pipes within the Assessment Area as overland flow from offsite areas keeps flood stages high.

- Overall, it was ineffective to upsize pipes in areas served by pumps without also upsizing pumps.

MODIFYING/ADDING PUMP STATIONS

Pump stations were adjusted or added to the systems to test if they would help drawdown flooding through the system. Various pump scenarios were tested and are as follows:

- **Add Mini Pump Stations (3cfs) to Existing Outfalls**
- **Add Mini Pump Stations (10cfs) to Existing Outfalls**
- **Add large pump stations upstream of North Lakes**
- **Add large pump stations downstream of North Lakes**
- **Add Mini Pumps AND Stations Upstream of North Lakes**
- **Add Mini Pumps AND Stations Downstream of North Lakes**
- **Add large pump stations upstream of North Lakes AND Connect as needed**
- **Add Mini Pumps AND Stations Upstream of North Lakes AND Connect as needed**
- **Improve existing South pumps with no other modifications**
- **Expand/connect infrastructure to Existing South Pump Stations**
- **Detach Pipes from Existing Pump Stations**

The following observations of results and subsequent conclusions were drawn:

- Adding rating curve links (pumps) at small flows (less than 10 cfs) provides localized reductions in flooding at smaller outfalls but did not provide modeled flood reduction at major outfalls.

- When adding pumps upstream of lakes, the improvements are localized to pump locations due to upstream pipes restricting flow to the pump station.

- When adding pumps downstream of lakes the downstream infrastructure limits flood reduction. When connecting infrastructure to an existing pump, the downstream infrastructure needs to be upsized to handle additional flow.

- Diverting existing pipe connections to new pump station reduces stages, as it reduces the incoming flow to existing pump station.

COMBINATION RUNS

Knowing that Areas B and C are limited by both pump and pipe sizes the following models were run to test the efficacy of combining infrastructure adjustments and pump station modifications:

- **Expand/connect infrastructure to Existing Pump Stations AND Upsize Pumps**
- **Upsize All Pipes to 60in, Triple pump links**
- **Double Link Count for Pipes, Drop Structures, and Pumps**

Results of these runs further support the findings of the “Upsizing Pipe Systems” runs and “Modifying/Adding Pump Stations” runs.

OTHER RESILIENCE SOLUTIONS

- **Seawalls**
- **Raising roads by 1’**
- **Adding check valves to all outfall pipes**
- **Additional Storage**

The following observations of results and subsequent conclusions were drawn:

- In existing conditions, adding seawalls without also upsizing or adding other stormwater infrastructure increases flooding because it restricts overland flow out of the Assessment Areas. Seawalls may result in a different result in a future condition (i.e. with sea level rise).

- Raising roads decreases flood depths on roads but increases flooding outside the right-of-way because roadway storage has been reduced. This solution would need to be included in combination with another solution such as pump stations or increased pipe sizes.

- Adding check valves in areas that did not already have them had no effect on the system. This may result in a different result in a future condition (i.e. with sea level rise).

- Additional storage (amount was limited due to feasibility) resulted in local flood reduction but does not reduce flooding through the whole system.

Kimley»Horn

ICF Report

Damage Assessment Modeling

Damage Assessment Introduction

This section of the report focuses on ICF's estimation of the benefits of avoiding potential economic impacts due to flooding, focusing on the following factors:

- Property damage
- Commercial disruption
- Roadway impacts
- Property value impacts
- Property tax impacts

The combination of these components provides a holistic view of the potential flooding impacts by examining impacts to homeowners (e.g., property damages and property value impacts), business owners (e.g., commercial disruption), and City government operations (e.g., roadway impacts and tax revenue implications).

ICF evaluated flooding impacts across four condition sets for both the 10-year flood and 25-year flood, considered in the hydraulic modeling portion of the project. These scenarios consider sea-level rise impacts (e.g., existing conditions with no modeled sea level rise versus future conditions with sea level rise) as well as modeled improvements (e.g., no improvements versus proposed improvements). Results in this section are presented across these condition sets for the 50-year period of 2040 to 2090, in 2023 dollars:

- Existing Conditions with no improvements (EC no Inv)
- Existing Conditions with proposed improvements (EC Inv)
- Future Conditions with no improvements (FC no Inv)
- Future Conditions with proposed improvements (FC Inv)

ICF presents property damages, commercial damages, and roadway damages as expected damages, meaning that they are probabilistic in nature.[1] ICF estimated that 10-year flood and the 25-year flood would have a probability of occurring in any given year of 10 percent (1/10) or 4 percent (1/25), respectively.[2] ICF estimates damage amounts by multiplying the risk rate for any given year a flood could occur by the damages that would ensue for a flood actually occurring in that year.

The City of Naples will be subject to damage from other types of storms, not exclusively the 10-year and 25-year floods. Such storms could include a 50-year flood, a 100-year flood, or other tropical storms and hurricanes. Kimley-Horn and ICF did not model the flood inundation or economic impacts associated with additional storm types in this report. **Therefore, the results in this analysis are a very conservative estimate of the benefits the City of Naples could expect by making flood resilience investments.**

The rest of this section is divided into six sections that present the high-level methodology and results, including 1) property damages, 2) commercial damages, 3) roadway damages, 4)

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[1] ICF did not compute property value impacts and tax revenue impacts using expected value methodology.

[2] ICF assumed the probability of a 10-year flood occurring in any given year was independent of the occurrence of a 25-year flood in the same year. The independence of these events implies that the expected damages from each may be summed within a given year for a specific damage type.

property value impacts, 5) property tax impacts and 6) summary results. Detailed technical explanations of the methodologies can be found in the Technical Appendix at the end of the report.

Property Damage

Flood inundation can result in significant damage to both building structures and contents, and the prevention of these flood waters results in avoided property damages. To estimate condition-, flooding scenario- and property-specific inundation damages, ICF utilized depth-damage functions (DDFs) matched to residential properties' inundation levels to determine both the structural and contents damages of each scenario-property combination. ICF then applied a risk rate and summed these expected damage amounts across properties and years for the period 2040 to 2090.

ICF adopted residential DDFs for freshwater flooding calculated by the U.S Army Corps of Engineers (USACE) for this analysis.[3] Specifically, ICF used four separate DDFs for either single-family or multi-family residential properties as well as the respective damages to a property's structure and contents. We used structural DDFs to calculate the residential property damages to the underlying structure of a property, and contents DDFs to calculate the damage to household goods contained within a property (e.g., furniture, electronics, media, or other personal goods). ICF applied both individually for each property to calculate the total expected damages caused by flood inundation. DDFs are stepwise functions where each incremented level of inundation corresponds to a percentage of damage in terms of housing value. DDF's inundation levels used in this analysis are provided in half-foot increments, ranging from -1.5 feet to 15.0 feet, in which 0 represents the first finished floor elevation and negative inundation levels from -0.5 to -1.5 are below that.

To estimate the flood inundation of each residential property under each condition set, ICF subtracted each property's imputed first-floor elevation (FFE) by condition-set specific inundation data provided by Kimley-Horn.[4] This calculation returned the net inundation levels across the residential properties assessed for each condition-flooding combination. ICF rounded these net inundation results to the nearest half-foot increment to correspond to the inundation levels in the DDFs. For each condition set, ICF matched each property and net inundation to the appropriate DDFs to attain structural and contents percent damages.

The property value assessments available for City of Naples' residential properties are from 2022. We used a growth rate of 3.79 percent to inflate the property values to 2023. We further assume property values stay constant until 2040 and during the analysis period from 2040 to 2090.[5] For each condition set, we multiplied each property's assessment amount (in 2023 dollar terms) by either the structural or contents damage percentage matched from the DDFs and by a

[3] DDFs used from the USACE also assume a flooding duration of 72 hours or less, cement slab foundations, and the middle-ground level of damages, as opposed to other DDFs available assuming saltwater flooding, flooding durations greater than 72 hours, foundations on piers, and minimum or maximum damages.

[4] Imputed FFEs were collected from properties' FFE certifications or from a summarized FFE level specific to a representative point among City of Naples' residential properties.

[5] The property growth rate of 3.79 percent was derived from the U.S. Census Bureau's American Community Survey (ACS) by calculating the 10-year compound annual growth rate of median housing value for Collier County, FL. All benefits are calculated in 2023 dollar terms so that the analysis can hold inflation effects constant. Property values are likely to continue appreciation past 2023, however, ICF did not continue inflating property values so that all benefits could be calculated in 2023 dollar terms.

risk rate associated with the storm type (e.g., 10 percent for the 10-year 1-hour flood and 4 percent for the 25-year 72-hour flood) to account for the probability of storm occurrence.[6] We then summed structural and contents damages for each property to estimate the total expected property damages from 2040 to 2090.

For the overall analysis period from 2040 to 2090, the sum of expected residential property damages under existing conditions, without resilience investments, are estimated at $15.3 million for the 10-Year storm, and $13.3 million for the 25-Year storm, for a total of $28.6 million. For existing conditions with resilience investments, expected residential property damages are estimated at $0.1 million for the 10-Year storm and $0.5 million for the 25-Year storm, for a 50-year total of $0.6 million over the full analysis period. The avoided damages, or benefits, of resilience investments can be determined by subtracting the existing conditions, with investment, total from the existing conditions, no investment, total. **This calculation results in the avoided property damage benefits of resilience investment under existing conditions of $27.9 million over 50 years**.

Expected residential property damage estimates under future conditions are similar. For future conditions, without resilience investments, expected residential property damages are estimated at $74.2 million for the 10-Year storm, and $32.2 million for the 25-Year storm, for a total of $106.4 million over the analysis period. For future conditions with resilience investments, expected residential property damages are estimated at $0.1 million for the 10-Year storm and $1.8 million for the 25-Year storm, for a 50-year total of $1.9 million. **The avoided property damages, or benefits, of resilience investments under future conditions total $104.5 million over 50 years**.

Table 1 shows these figures for residential property damages by assessment area, condition set, storm type, and associated deltas (benefits) and totals.

[6] While other storm types, such as 5-year and 50-year floods, as well as major hurricanes also pose flood risk to the assessed areas, this analysis was limited to the impacts of 10-year and 25-year storms.

Table 1: 50 Year Total of Residential Property Damages for 10-Year and 25-Year Storms Under Existing and Future Conditions (2023 Dollars in Thousands)

		Condition Sets			Condition Sets		
Storm type	**Assessment Area**	**EC - No Inv**	**EC - Inv**	**EC Benefits**	**FC - No Inv**	**FC - Inv**	**FC Benefits**
10-Year	A	$3,478	$87	$3,391	$4,751	$91	$4,660
	B	$4,331	$-	$4,331	$12,781	$-	$12,781
	C	$6,677	$-	$6,677	$43,728	$-	$43,728
	D	$795	$-	$795	$3,052	$-	$3,052
	E	$25	$4	$21	$9,852	$10	$9,842
	Total	**$15,307**	**$91**	**$15,216**	**$74,164**	**$101**	**$74,063**
25-Year	A	$2,055	$68	$1,987	$4,112	$201	$3,911
	B	$3,902	$448	$3,454	$5,112	$448	$4,664
	C	$6,936	$6	$6,930	$17,853	$1,129	$16,725
	D	$351	$-	$351	$1,221	$2	$1,219
	E	$12	$4	$8	$3,941	$7	$3,934
	Total	**$13,256**	**$526**	**$12,730**	**$32,239**	**$1,786**	**$30,453**
Grand Total	A	$5,533	$155	$5,378	$8,863	$292	$8,571
	B	$8,233	$448	$7,785	$17,893	$448	$17,445
	C	$13,614	$6	$13,608	$61,581	$1,129	$60,453
	D	$1,146	$-	$1,146	$4,273	$2	$4,270
	E	$37	$7	$30	$13,792	$16	$13,776
	Total	**$28,563**	**$617**	**$27,946**	**$106,403**	**$1,887**	**$104,516**

Note: Blank cells denoted with "-" indicate that there were no damages under a respective assessment area.

Commercial Damages

Businesses can experience revenue losses because flooding inundation interrupts business operations, either by direct flooding or by isolating businesses so customers cannot reach the stores. For this analysis, we assumed that commercial properties suffer revenue losses and are unable to operate entirely while inundated due to storm water. To estimate commercial business disruptions, this analysis uses Collier County-specific data on business revenues coupled with flood duration data from the hydraulic model.

To estimate the daily revenue of businesses in City of Naples, we relied on U.S. Census Bureau data from the 2017 Economic Census (filtered for Collier County and by NAICS industry). We calculated business-specific, daily revenue figures by dividing industry-specific total annual revenues by the number of establishments in each industry and number of days in the year. Next, we developed a crosswalk between the use-codes, or building types, available in data on City of Naples' properties and NACIS codes to match the daily per-business revenue amounts to commercial properties.

Kimley-Horn estimated flood duration estimates (in hours) across the study area. ICF then identified which commercial properties were affected based on the storm type and condition set. This data transformation resulted in the number of days in which specific business would be disrupted (see the Technical Appendix for a detailed description of data manipulation steps).

ICF then matched the days of flooding and the daily revenue figures for each commercial property in the study area. For each storm type and condition set, we calculated commercial business disruption by multiplying daily revenue by the number of days flooded and further by the risk rate associated with the storm type (e.g., 10 percent for the 10-year 1-hour flood and 4 percent for the 25-year 72-hour flood).

To be consistent with the cost estimation method, we keep our benefits in 2023 dollar year terms.[7]

For the overall analysis period from 2040 to 2090, the sum of expected commercial business disruptions under existing conditions, without resilience investments, are estimated at $0.6 million for the 10-Year storm, and $1.3 million for the 25-Year storm, for a total of $1.9 million. For existing conditions with resilience investments, expected commercial business disruptions are estimated at $0.6 million for the 10-Year storm and $1.3 million for the 25-Year storm, for a 50-year total of $1.9 million over the period of analysis. The avoided damages, or benefits, of resilience investments can be determined by subtracting the existing conditions, with investment, total from the existing conditions, no investment, total. **This calculation results in avoided commercial disruption benefits of resilience investment under existing conditions of $17,000 over 50 years**.

Commercial business disruption estimates under future conditions are substantially higher. For future conditions, without resilience investments, expected commercial business disruptions are estimated at $6.6 million for the 10-Year storm, and $4.7 million for the 25-Year storm, for a total of $11.4 million over the full analysis period. For future conditions with resilience investments, expected commercial business disruptions are estimated at $0.6 million for the 10-Year storm and $0.9 million for the 25-Year storm, for a 50-year total of $1.5 million. **The avoided commercial damages, or benefits, of resilience investments under future conditions total $9.9 million over 50 years**. We find that the future conditions expected commercial disruptions are much higher than existing conditions due to the intensity of flooding under future conditions.

Table 2 shows these figures for expected commercial business disruptions by assessment area, condition set, storm type, and associated deltas and totals.

[7] A constant inflation rate of 3.0 percent is used to adjust for inflation to 2023.

Table 2: 50 Year Total of Commercial Business Disruption for 10-Year and 25-Year Storms Under Existing and Future Conditions (2023 Dollars in Thousands)

		Condition Sets			Condition Sets		
Storm type	**Assessment Area**	**EC - No Inv**	**EC - Inv**	**EC Benefits**	**FC - No Inv**	**FC - Inv**	**FC Benefits**
10-Year	A	$590	$588	$2	$5,349	$590	$4,760
	B	$1	$-	$1	$775	$-	$775
	C	$-	$-	$-	$505	$-	$505
	D	$-	$-	$-	$12	$-	$12
	E	$-	$-	$-	$-	$-	$-
	Total	**$590**	**$588**	**$3**	**$6,641**	**$590**	**$6,052**
25-Year	A	$1,326	$1,322	$5	$2,140	$878	$1,262
	B	$1	$-	$1	$1,551	$-	$1,551
	C	$9	$-	$9	$1,010	$-	$1,010
	D	$-	$-	$-	$8	$-	$8
	E	$-	$-	$-	$-	$-	$-
	Total	**$1,336**	**$1,322**	**$15**	**$4,708**	**$878**	**$3,830**
Grand Total	A	$1,916	$1,909	$7	$7,489	$1,467	$6,022
	B	$1	$-	$1	$2,326	$-	$2,326
	C	$9	$-	$9	$1,515	$-	$1,515
	D	$-	$-	$-	$20	$-	$20
	E	$-	$-	$-	$-	$-	$-
	Total	**$1,927**	**$1,909**	**$17**	**$11,350**	**$1,467**	**$9,882**

Sensitivity of Methodology

The expected commercial business disruption damages estimated above are likely an underestimate of the true impact of such flooding due to the assumptions used in this analysis. First, the disruption impacts are limited to when the businesses are inundated. The benefits model assumes that business returns to 100 percent of pre-flood activity as soon as waters recede. There are likely substantial additional days of closure or operation below 100 percent of pre-flood revenue levels while businesses remediate storm damage. These remediation measures can take months.[8] Second, the remediation measures required to re-open may require structural repairs to the business's building which are not captured in the estimates above.

To estimate the impact of the first assumption, ICF performed a sensitivity on the commercial business disruption figures using the method described above but added a flat 1 week (7 days) of 100 percent revenue loss to each property which experienced inundation in either the existing or future conditions scenarios. Properties which were not inundated in either scenario or storm

[8] "Benefit-Cost Analysis Sustainment and Enhancements: Standard Economic Value Methodology Report." Federal Emergency Management Agency. May 2023. https://www.fema.gov/sites/default/files/documents/fema_standard-economic-values-methodology-report_2023.pdf. See report's Table 4, "Recovery Time by Occupancy Type and Flood Depth." The table reports Physical Restoration Time of Retail Trade between 7 and 13 months for inundation between 0 and 4 feet.

type were still presumed to continue operating as normal. ICF performed a further sensitivity using the same method but assumed an additional 90 days of 100 percent revenue loss due to flood remediation disruptions. The results of the sensitivity analyses are presented in Table 3 (existing conditions) and Table 4 (future conditions) below.

Table 3: 50 Year Total of Commercial Business Disruption for 10-Year and 25-Year Storms Under Existing Conditions 7 and 90-Day Disruption Sensitivities, (2023 Dollars in Thousands)

		Existing No Inv			Existing Inv			Existing Delta		
Storm Type	**Assessment Area**	**Total Disruptions**	**Plus 7 days flooding**	**Plus 90 days flooding**	**Total Disruptions**	**Plus 7 days flooding**	**Plus 90 days flooding**	**Total Disrupt Delta**	**Plus 7 Delta**	**Plus 90 Delta**
			[A]	**[B]**		**[C]**	**[D]**		**[E] = [A] – [C]**	**[F] = [B] – [D]**
10-Year	A	$590	$7,550	$90,075	$588	$7,548	$90,073	$2	$2	$2
	B	$1	$187	$2,396	$-	$-	$-	$1	$187	$2,396
	C	$-	$-	$-	$-	$-	$-	$-	$-	$-
	D	$-	$-	$-	$-	$-	$-	$-	$-	$-
	E	$-	$-	$-	$-	$-	$-	$-	$-	$-
	Total	**$590**	**$7,736**	**$92,470**	**$588**	**$7,548**	**$90,073**	**$3**	**$189**	**$2,398**
25-Year	A	$1,326	$4,110	$37,120	$1,322	$4,106	$37,116	$5	$5	$5
	B	$1	$112	$1,433	$-	$-	$-	$1	$112	$1,433
	C	$9	$1,061	$13,532	$-	$-	$-	$9	$1,061	$13,532
	D	$-	$-	$-	$-	$-	$-	$-	$-	$-
	E	$-	$-	$-	$-	$-	$-	$-	$-	$-
	Total	**$1,336**	**$5,284**	**$52,085**	**$1,322**	**$4,106**	**$37,116**	**$15**	**$1,178**	**$14,969**
Grand Total	A	$1,916	$11,660	$127,195	$1,909	$11,653	$127,188	$7	$7	$7
	B	$1	$299	$3,829	$-	$-	$-	$1	$299	$3,829
	C	$9	$1,061	$13,532	$-	$-	$-	$9	$1,061	$13,532
	D	$-	$-	$-	$-	$-	$-	$-	$-	$-
	E	$-	$-	$-	$-	$-	$-	$-	$-	$-
	Total	**$1,927**	**$13,020**	**$144,555**	**$1,909**	**$11,653**	**$127,188**	**$17**	**$1,367**	**$17,367**

Table 4: 50 Year Total of Commercial Business Disruption for 10-Year and 25-Year Storms Under Future Conditions 7 and 90-Day Disruption Sensitivities, (2023 Dollars in Thousands)

		Future No Inv			Future Inv			Future Delta		
Storm Type	**Assessment Area**	**Total Disruptions**	**Plus 7 days flooding**	**Plus 90 days flooding**	**Total Disruptions**	**Plus 7 days flooding**	**Plus 90 days flooding**	**Total Disrupt Delta**	**Plus 7 Delta**	**Plus 90 Delta**
			[A]	**[B]**		**[C]**	**[D]**		**[E] = [A] – [C]**	**[F] = [B] – [D]**
10-Year	A	$5,349	$12,309	$94,834	$590	$7,550	$90,075	$4,760	$4,760	$4,760
	B	$775	$5,118	$56,610	$-	$-	$-	$775	$5,118	$56,610
	C	$505	$3,332	$36,855	$-	$-	$-	$505	$3,332	$36,855
	D	$12	$2,641	$33,817	$-	$-	$-	$12	$2,641	$33,817
	E	$-	$-	$-	$-	$-	$-	$-	$-	$-
	Total	**$6,641**	**$23,401**	**$222,117**	**$590**	**$7,550**	**$90,075**	**$6,052**	**$15,851**	**$132,042**
25-Year	A	$2,140	$4,924	$37,934	$878	$3,662	$36,672	$1,262	$1,262	$1,262
	B	$1,551	$3,288	$23,885	$-	$-	$-	$1,551	$3,288	$23,885
	C	$1,010	$2,141	$15,550	$-	$-	$-	$1,010	$2,141	$15,550
	D	$8	$1,060	$13,530	$-	$-	$-	$8	$1,060	$13,530
	E	$-	$-	$-	$-	$-	$-	$-	$-	$-
	Total	**$4,708**	**$11,412**	**$90,898**	**$878**	**$3,662**	**$36,672**	**$3,830**	**$7,750**	**$54,227**
Grand Total	A	$7,489	$17,233	$132,768	$1,467	$11,211	$126,746	$6,022	$6,022	$6,022
	B	$2,326	$8,406	$80,495	$-	$-	$-	$2,326	$8,406	$80,495
	C	$1,515	$5,473	$52,405	$-	$-	$-	$1,515	$5,473	$52,405
	D	$20	$3,701	$47,347	$-	$-	$-	$20	$3,701	$47,347
	E	$-	$-	$-	$-	$-	$-	$-	$-	$-
	Total	**$11,350**	**$34,813**	**$313,015**	**$1,467**	**$11,211**	**$126,746**	**$9,882**	**$23,601**	**$186,269**

The sensitivity for 7 additional days of 100 percent revenue loss shows $1.4 million in benefits under existing conditions for both the 10-year and 25-year storms together and $23.6 million under future conditions for both storms together in 2023 dollars. This is a minimum case sensitivity to understand what the impact would be for one week's additional expected business disruption at 100 percent revenue loss. **This 7-day disruption sensitivity calculation results in avoided commercial disruption damages of $1.4 million under existing conditions and $23.6 million under future conditions, over 50 years**.

The sensitivity for 90 additional days of 100 percent revenue loss shows $17.4 million under existing conditions and $186.3 million under future conditions, considering both storms. **This 90-day sensitivity calculation results in avoided commercial disruption damages of $17.4 million for existing conditions and $186.3 million in benefits under future conditions, over 50 years.**

Commercial business recovery of 100 percent revenue immediately after flood waters recede represents an underestimate of actual disruption and an overly conservative estimation of benefits. ICF believes that there would be substantial additional days of closure or operation below 100 percent of pre-flood revenue levels while the operator remediates from storm damage. Therefore, ICF believes the 90-day additional disruption values are the most reasonable estimates, and in further summaries of total benefits ICF only shows the benefits associated with the 90-day addition to commercial disruption.

Roadway Damages

Roadways can be damaged by flooding in a similar manner to other assets. This analysis examined the number of roadways in the City of Naples damaged under various scenarios and storm types. The analysis assigned a damage amount based on estimated cost to repair the road segment.

The roadway damages were estimated using inundation data provided by Kimley-Horn through hydraulic modelling. ICF considered a road damaged if it was inundated by any amount during a storm event, under either existing or future conditions scenario. Road segment damages were based on the estimated cost to repair the damaged road per linear foot. ICF grouped roads into three classes, each with a different cost to repair per linear foot. The classes include, "Arterial," "Collector," and "Local". Table 5 shows the estimated cost to repair each class of road.[9]

Table 5: Roadway Damages Cost to Repair by Roadway Class

Class	Cost to Repair / ft (2023 Dollars)
Arterial	$247
Collector	$185
Local	$62

[9] See Technical Appendix for additional calculations and documentation.

We estimated expected roadway damages in each year of the analysis period (2040-2090), for each condition set and storm type. For a given storm type and condition set we estimated total linear feet of inundated roadway, by roadway class in each assessment area. We multiplied total linear feet inundated by the risk rate associated with the storm type (e.g., 10 percent for the 10-Year 1-Hour) and the roadway cost of repair per linear foot. We then summed the expected damage amounts across all years in the analysis period and assessment areas.

The sum of expected roadway damages under existing conditions, without resilience investments, are estimated at $14.6 million for the 10-Year storm, and $8.0 million for the 25-Year storm, for a total of $22.6 million over the full analysis period. For existing conditions with resilience investments, expected roadway damages are estimated at $0.3 million for the 10-Year storm and $1.1 million for the 25-Year storm, for a 50-year total of $1.4 million. The avoided damages, or benefits, of resilience investments can be determined by subtracting the existing conditions, with investment, total from the existing conditions, no investment, total. **This calculation results in avoided roadway damage benefits of resilience investment under existing conditions of $21.2 million over 50 years.**

Roadway damage estimates under future conditions are similar, but higher. For future conditions, without resilience investments, expected roadway damages are estimated at $23.4 million for the 10-Year storm, and $10.1 million for the 25-Year storm, for a total of $33.5 million over 50 years. For existing conditions with resilience investments, expected roadway damages are estimated at $1.1 million for the 10-Year storm and $2.0 million for the 25-Year storm, for a 50-year total of $3.1 million. **The avoided roadway damages, or benefits, of resilience investments under future conditions total $30.5 million over 50 years.**

Table 6 shows these figures by assessment area, condition set, storm type, and associated deltas and totals.

Table 6: 50 Year Total of Roadway Damages (Risk Weighted) for 10-Year and 25-Year Storms Under Existing and Future Conditions (2023 Dollars in Thousands)

		Condition Sets			Condition Sets		
Storm type	**Assessment Area**	**EC - No Inv**	**EC - Inv**	**EC Benefits**	**FC - No Inv**	**FC - Inv**	**FC Benefits**
		[A]	**[B]**	**[C] = [A] – [B]**	**[D]**	**[E]**	**[F] = [D] – [E]**
10-Year	A	$5,754	$105	$5,649	$9,197	$449	$8,748
	B	$2,202	$0	$2,202	$3,534	$5	$3,529
	C	$3,895	$6	$3,889	$5,517	$38	$5,479
	D	$2,572	$208	$2,364	$4,177	$218	$3,959
	E	$155	$25	$130	$992	$348	$644
	Total	**$14,578**	**$344**	**$14,233**	**$23,417**	**$1,059**	**$22,359**
25-Year	A	$3,886	$622	$3,264	$4,321	$1,340	$2,981
	B	$1,018	$98	$920	$1,416	$278	$1,138
	C	$1,764	$5	$1,759	$2,211	$43	$2,168
	D	$1,292	$313	$980	$1,767	$204	$1,563
	E	$84	$43	$40	$397	$155	$242
	Total	**$8,043**	**$1,081**	**$6,963**	**$10,112**	**$2,019**	**$8,093**
Grand Total	A	$9,640	$727	$8,913	$13,518	$1,788	$11,729
	B	$3,219	$98	$3,121	$4,950	$283	$4,667
	C	$5,659	$11	$5,648	$7,728	$81	$7,647
	D	$3,864	$521	$3,343	$5,945	$422	$5,522
	E	$239	$69	$170	$1,389	$503	$886
	Total	**$22,621**	**$1,425**	**$21,196**	**$33,530**	**$3,077**	**$30,452**

Property Value Impacts

Numerous economic studies show that being in a flood zone lowers property values (McAlpine and Porter, 2018). Some studies have found that decreases in home prices were driven by the experiences of recent flooding events, with negative price impacts diminishing over time. Moreover, some studies found that being in a designated Special Flood Hazard Area had a greater effect on home prices near the coast than on home prices near water in interior regions (Johnston and Moeltner, 2018). To support analysis of impacts from the city's infrastructure investment on property values, ICF developed hedonic pricing models to estimate how the City of Naples' housing market reacts to potential flood risk.

When people consider a home to buy, they consider a multitude of characteristics that comes with that home. In addition to looking at the structure of the home, they also consider its location, its proximity to amenities and disamenities, the neighborhood culture, other personally important characteristics, and, in the case of the City of Naples, its likelihood of being flooded. The theory behind hedonic analysis is that after controlling for all factors that contribute to home prices, one can isolate how much people are willing to pay for a particular characteristic. Hedonic models are often used to estimate the effect of certain environmental attributes on home prices.

This analysis examines the negative impacts of flood risk on both condo and single-family home prices in the City of Naples. Similar to Johnston and Moeltner (2019), this analysis used elevation as a proxy for flood risk, as homes and roads at lower elevations are more prone to flooding than homes and roads at higher elevations. Given the frequency and severity of flooding in the City of Naples, as well as the media attention the flooding generates, home buyers are likely aware of the location of recent flooding events and factor this knowledge into their home purchasing decisions.

The hedonic analysis developed three models to evaluate the impacts of flooding on housing values, 1) a Condo Only model, 2) a Single-family Only model, and 3) an All-Sales model. The Technical Appendix details the parameterization of the hedonic models, including detailed descriptions of the household and neighborhood characteristics and methods used to calibrate these models. The All-Sales model is the most appropriate when comparing to other City-wide impacts, as the model factors in all home types. Model results show that home buyers are willing to pay a premium for the additional flood protection benefits afforded by nearby roads with higher average elevations of home parcels. For example, homeowners would have a reduced risk of losing road access to amenities and necessities (e.g., beaches, hospitals) in an area with higher elevated roads. Based on the All-Sales model, a one-foot increase in the mean elevation of roads within a home's associated census tract results in a 0.77 percent increase in housing price. Similarly, a one-foot increase in mean parcel elevation results in a 0.02 percent increase in housing price.

For the damage assessment, only road elevation impacts were included in the overall damage estimates, as overlapping benefits may occur between the property elevation impacts and the residential property damages. As both property value impacts and property structural damage rely on a property's elevation, the former was excluded to ensure there was no double counting. The All-Sales road elevation coefficient from the hedonic model was solely used to determine the property value impacts from resilience investments. Because the hedonic analysis employed a log-linear model, a transformation was used to estimate the percentage change in property value for a one unit increase in the road elevation.[10] To monetize the value impacts for each observation under each storm type and condition set, we multiplied the adjusted coefficient by the property value and the difference in elevation between the with and without investment scenarios. The result was the total property value impact due to a change in road elevation. To annualize this value and make it compatible with calculating annual benefits to investment scenarios, we derived the annual rental-equivalents for each property value impact by multiplying the total value impacts by a discount rate of 3 percent (see Technical Appendix for more information).

The estimated property value benefits of resilience investment under the existing conditions scenario are \$4.5 million for the 10-Year storm, and \$2.8 million for the 25-Year storm. **Total property value benefits of resilience investment under the existing conditions scenario are estimated at \$7.4 million over 50 years.** For future conditions, property value impact benefits are estimated at \$5.3 million for the 10-Year storm, and \$2.0 million for the 25-Year storm. **Total property value benefits of resilience investment under the future conditions scenario are estimated at \$7.3 million over 50 years.**

[10] This calculation includes an exponential transformation on the coefficient, subtracting one from this value, and multiplying by 100. In the case of the road elevation coefficient this amounted to 0.769% = $(e^{0.766} - 1) / 100$.

Table 7 shows these estimates by assessment area, condition set, storm type, and associated totals.

Table 7: 50 Year Total of Property Value Impacts for 10-Year and 25-Year Storms Under Existing and Future Conditions (2023 Dollars in Thousands)

Storm type	Assessment Area	EC Benefits	FC Benefits
10-Year	A	$2,520	$2,485
	B	$348	$471
	C	$1,493	$2,018
	D	$161	$290
	E	$-	$-
	Total	**$4,522**	**$5,263**
25-Year	A	$1,618	$764
	B	$202	$198
	C	$865	$854
	D	$144	$219
	E	$-	$-
	Total	**$2,829**	**$2,036**
Grand Total	A	$4,139	$3,249
	B	$549	$669
	C	$2,358	$2,873
	D	$305	$508
	E	$-	$-
	Total	**$7,351**	**$7,299**

Property Tax Impacts

The flood resilience investments that result in increased property values are expected to result in relative increases in property value (or the preservation of property values that would otherwise be in decline in the absence of resilience investments). These changes in property values will result in changes to property tax revenues. To estimate changes in property tax revenues, this analysis took the results of the annual property value impacts, including the effects of both property elevation and road elevation, and multiplied them by local tax rates.

We used Collier County millage rates from 2022 and assumed those rates remained constant over the 50-year analysis period from 2040 to 2090.[11] We multiplied these tax rates by the undiscounted property value impacts for each property and year as well as for each storm type and condition set. Property value impacts include the dollar impacts of both road elevation (described above) and property elevation (described further in the Technical Appendix) to provide the full scope of a change in elevation, or decreased potential for flooding with resilience investments, impacts on a property's value and therefore the tax revenue resulting from property taxes.

[11] A millage rate is the total tax due per $1,000 of assessed property value. This analysis included all assessments in the total millage rate, including for schools and other items.

Similar to property value impacts, tax revenue impacts are presented as the difference between flood conditions with and without resilience investments because they capture the impact of an additional foot of elevation. These incremental impacts represent the differential between investment and no investment scenarios, which captures the impact on tax revenue. For the existing conditions scenario, the tax revenue benefits resulting from resilience investments impacts on property values are estimated at $1.7 million for the 10-Year storm, and $1.1 million for the 25-Year storm. **Total tax revenue impacts for the existing conditions scenario are estimated at $2.8 million over 50 years.** For future conditions, with resilience investments, tax revenue benefits are estimated at $2.0 million for the 10-Year storm, and $0.8 million for the 25-Year storm. **Total tax revenue impacts for the future conditions scenario are estimated at $2.8 million over 50 years**.

Table 8 shows these figures by assessment area, condition set, storm type, and associated totals.

Table 8: 50 Year Total of Tax Revenue Impacts for 10-Year and 25-Year Storms Under Existing and Future Conditions (2023 Dollars in Thousands)

Storm type	Assessment Area	Existing Conditions	Future Conditions
10 Year	A	$923	$920
	B	$126	$172
	C	$577	$777
	D	$57	$102
	E	$0	$1
	Total	**$1,684**	**$1,972**
25 Year	A	$614	$314
	B	$73	$74
	C	$348	$357
	D	$52	$77
	E	$0	$1
	Total	**$1,087**	**$823**
Grand Total	A	$1,538	$1,234
	B	$199	$246
	C	$925	$1,134
	D	$109	$179
	E	$0	$2
	Total	**$2,770**	**$2,795**

Note: Zero dollar values indicate values less than $1,000 and are non-zero.

Summary Results

The above sections highlight the methods and results of the five impact categories assessed as part of this analysis. The total benefits of resilience investments are the sum of the difference in damages between with-investment and without-investment cases across residential property damages, commercial damages, roadway damages, and property value impacts. A summary of these results is presented in Table 9 below.

- Avoided property damages comprise the largest component of total benefits for the existing conditions scenarios at **$27.9 million (36 percent)** and the second largest component of total benefits for the future conditions scenario at **$104.5 million (32 percent)**.

- Avoided commercial business disruptions with a 90-day post-flood closure period comprise the second largest component of total benefits for the existing conditions scenario at **$17.4 million (23 percent)** and the largest component of total benefits for the future conditions scenario at **$186 million (56 percent)**.
- Avoided roadway damages represent the third largest component of the total benefits at **$21.2 million (28 percent) and $30.5 million (9 percent)** for both existing and future conditions scenarios, respectively.
- Estimated increases in property values ($7.4 million and $7.3 million) are more muted compared to avoided property and roadway damage.

In general, benefits under the future conditions are higher than existing conditions due to the larger intensity of storms expected in the future. Larger intensity storms result in more flooding, and therefore the impacts of the proposed resilience investments in protecting property, infrastructure, and businesses are greater.

The estimated benefits are not evenly distributed across the assessment areas, because of their characteristics. The benefits are the greatest in Assessment Area C, followed in decreasing order by Areas B, D, A, and E for future conditions and Area C, A, B, D, and E for existing conditions. Assessment Area C's larger benefits result from a higher density of homes within the study area and generally higher residential property values (and therefore more avoided residential property damages). Table 9 presents the total benefits.

See the Technical Appendix for results on a per-storm basis.

Table 9: 50 Year Total Benefits for 10-Year and 25-Year Storms Under Existing and Future Conditions (2023 Dollars in Thousands)

Storm type	Assessment Area	Existing Conditions	Future Conditions
10-Year	A	$11,563	$20,653
	B	$9,276	$73,391
	C	$12,059	$88,080
	D	$3,320	$41,118
	E	$151	$10,486
	Total	**$36,369**	**$233,728**
25-Year	A	$6,873	$8,919
	B	$6,008	$29,886
	C	$23,086	$35,297
	D	$1,475	$16,531
	E	$49	$4,176
	Total	**$37,491**	**$94,809**
Grand Total	A	$18,436	$29,571
	B	$15,284	$103,277
	C	$35,146	$123,377
	D	$4,794	$57,649
	E	$199	$14,662
	Total	**$73,860**	**$328,536**

Note: Total benefits do not include the property tax revenue impacts because such benefits are a transfer from property owners to local government. Such payments are treated as transfers because they do not increase or decrease the total economic value of the assets analyzed.

As noted in the introduction, the City of Naples will be subject to damage from other types of storms, not exclusively the 10-year and 25-year floods. Such storms could include a 50-year flood, a 100-year flood, or other tropical storms and hurricanes. Kimley-Horn and ICF did not model the flood inundation or economic impacts associated with these storms in this report. **Therefore, the results in this analysis are a very conservative estimate of the benefits the City of Naples could expect by making flood resilience investments.**

Technical Appendix

This Technical Appendix details ICF's methodology for estimating the benefits of resilience investment presented earlier in the report, including data sources, data cleaning and transformation steps, and results generation. This Appendix also presents information about the parameterization of the hedonic model.

Residential Property Damage

Depth-Damage Functions (DDF)

ICF estimates expected damage to residential properties using depth-damage functions (DDF). A DDF is a matrix which tells the user how much damage to the stock of value of a property (either contents or structural) is incurred when water inundates the property at a certain height. For example, a DDF may report that for 1.0 feet of inundation the property suffers 40 percent contents damage and 15 percent structural damage. These percentages, or damage factors, are then multiplied by the appropriate value of the property to report a dollar amount of damage.

ICF used residential DDFs from a 2006 U.S. Army Corps of Engineers (USACE) report that presented the depth-damage relationships identified for the district of New Orleans, Louisiana.[12] ICF gathered values for both single-family and multi-family residential DDFs from the report. The report differentiated single-family DDFs for both contents and structure by the property's number of stories (one-story or two-stories) and type of foundation (on a pier or on a slab). The report defined residential property categories according to a combination of these factors. ICF selected the one-story slab category to represent all single-family properties in the structure and contents DDFs. ICF defined multi-family properties as commercial structures under the USACE report, thus we generalized the structural DDFs available in the report to match several different commercial property types. Based on the new construction value per square foot of each commercial structure category, ICF chose the "wood and steel frame" structural DDF to stand in for the multi-family structural DDF. ICF identified a multi-family contents DDF in the USACE report and integrated it into the residential property damage analysis for these properties.

The report also differentiated DDFs for each property type by type of flooding (freshwater or saltwater) and duration of flooding (short or long). ICF incorporated only the freshwater DDFs to meet the criteria of this analysis. Both durations of flooding, defined as one day or less for short duration and two to three days for long duration under a freshwater flooding scenario, were input according to the duration of flooding experienced by each residential property in the City of Naples assessment areas. ICF derived the duration of flooding by property from a GIS analysis of elevation and flood timing. All properties were deemed to be exposed to a short duration of flooding at the baseline but the variation of short and long was kept in case of long duration floods in the future conditions. ICF reviewed seven sources of DDF values for residential property flooding, all of which were compiled by the USACE. All sources were reviewed for completeness, currency, applicability, and granularity. While some sources had more detailed property types that identified DDFs for a variety of residential properties, including condos and high-rises, they lacked the appropriate flooding conditions for this analysis (i.e., freshwater impacts). Other sources, while complete and applicable, were too old and/or contained dollar

[12] "Final Report: Depth-Damage Relationships for Structures, Contents, and Vehicles and Content-to-Structure Value Ratios (CSVR) in Support of the Donaldsonville to the Gulf, Louisiana, Feasibility Study". U.S. Army Corps of Engineers. March 2006. https://www.mvn.usace.army.mil/Portals/56/docs/PD/Donaldsv-Gulf.pdf.

estimates rather than percentage estimates in their DDFs. Similarly, ICF considered the granularity of the steps in the DDFs so that we could match the most precise damage factors to each property down to the half-foot. Considering these qualities of the available DDF sources, ICF chose the 2006 paper from the USACE report for New Orleans. ICF determined that the DDFs from this report, while older, were better suited to the purpose of our analysis.

First Floor Elevation (FFE) Imputation Method

In order to know the correct damage factor to use from the DDF, ICF needed to know the net inundation of the property, or how much of it is under water. To know net inundation, ICF also needed to know the maximum stage of water approaching the property and the first-floor elevation (FFE) of the property. Kimley-Horn provided ICF with the maximum stage of water height, relative to the North American Vertical Datum (NAVD88). ICF received further data from Kimley-Horn on the FFE of some properties within the assessed basins through elevation certificates, however, ICF did not have certificates for *all* properties within the assessed basins. Therefore, ICF imputed the FFE of many properties using the following method:

1. For the 356 properties with FFE certificates, ICF used the "LFE", line C2.a, from the elevation certificate (relative to the NAVD88).
2. 837 of the remaining properties did not have a certificate. Kimley-Horn provided ICF with FFE data for 25 representative points distributed throughout the 5 assessed basins. ICF then mapped the 837 remaining properties to the nearest of the 25 representative points. If the nearest point's distance to the property was 50 meters or less, ICF imputed the property's FFE to be equal to the representative point. ICF imputed 46 properties with this method.
3. If the property had no certificate FFE, and the nearest point was more than 50 meters away, ICF used a third method. ICF's GIS team was able to compute the mean ground elevation relative to the NAVD88 for all properties in the assessed basins. For those 356 properties assigned an FFE in method 1, ICF computed the ground clearance for the structure on the property as the difference between the certificate's FFE and the GIS-determined mean ground elevation. ICF then computed the median of these ground clearances by USECODE and assessed area and limited this set to medians computed using 5 or more observations. ICF then assumed that properties within the same assessed area and bearing the same USECODE shared equal ground clearances. ICF imputed 560 properties' FFEs using this method by adding the associated median ground clearance to GIS-determined mean elevation.
4. Following these three steps, 253 properties remained without an FFE. ICF imputed these properties' FFE using the nearest representative point method from #2 above. All of these properties were by definition more than 50 meters from the representative point used for imputation. ICF imputed 253 properties in this fashion. However, ICF checked the reasonableness of this imputation in several ways and found 84 potential outliers.
    a. ICF identified 84 potential outliers based on several criteria including:
        i. The property imputed by method 4;
        ii. The net inundation at the property at least 0.5 feet or more;
        iii. The difference between the imputed FFE and the known mean ground elevation of the parcel (determined through GIS data) is more than 2.0 feet.

b. For the 84 outliers ICF reviewed specific circumstances for the properties in order to maintain or justify the continued reliance on imputed FFE method #4. Specifically, ICF reviewed the property's assessed value from county property records, visually inspected the property using Google Maps®, re-checked for the presence of an FFE certificate file for the property, and compared the property to others within the area which had known FFE certificates on file.
c. ICF determined that for 44 of the 84 properties there was no assessed value for the parcel in the data provided by the City of Naples. ICF believes that in most, if not all cases, these parcels were publicly owned by the City of Naples, and therefore were not assessed for revenue purposes.
d. For the remaining 40 properties with an assessed value present, ICF performed visual inspection using the other sources such as Google Maps® Street View and determined a property's consistency with the imputed FFE via method 4 through visual inspection. ICF assigned these 40 remaining properties an FFE from method 4.

Residential Property Expected Damage Calculations

ICF calculated the expected residential property damages due to flooding as a function of the risk rate due to flooding, the net elevation of the property, and the structural value of the property for all scenarios and storm types.

$$D_{i,r,t,d} = V_{i,t} * R_r * F_d$$

This formula means that D (the damage) to property "i", under risk scenario "r", in year "t", of type "d" is a function of the value of property "i" in year "t" multiplied by the risk rate "r" and then multiplied by the appropriate damage factor "F" for damage type "d". A more detailed description of the components of the formula are presented below in Appendix Table 1.

Appendix Table 1: Parameter Definitions and Functional Form of Residential Property Damage

Symbol	Name	Definition	Range	Source
D	Damage	V * R * F		
V	Residential property value	Property structural value, excluding land		Parcels file – "IMPROVEDASSESSAMOUNT"
R	Risk rate	The inverse of the storm's year name (e.g., 1/10) for the 10 year storm.	4 – 10 percent	
F	Damage factor	A percentage of a property's structural value damaged due to flood waters	0 – 100 percent	Depth damage functions (DDF)

For each storm type ICF calculated the annual risk rate due to flooding as the inverse of the flooding scenario's name. For example, the 10-year storm has an annual risk rate of 1 / 10 = 0.1. The 25-year storm has a 1 / 25 = 0.04 risk rate.

To calculate the expected damage totals for the period of analysis, ICF inflated the improved assessment amount by 3.79 percent according the 10-year compound annual growth rate of median housing value for Collier County, FL derived from the U.S. Census Bureau's American Community Survey (ACS) to 2023.[13,14] ICF assumed the dollar values of the home in 2040 will be the same as the current 2023 value. We calculated contents and structural expected damage totals for the analysis period from 2040 to 2090 based on the residential property value in 2023 dollars, the corresponding risk rate for a 10 year of 25-year storm, and the corresponding damage factor from either the contents DDF or structural DDF matched using net inundation. We estimated total expected damages by summing across the contents and structural damage amounts for each year.

Commercial Business Disruption

Commercial business disruption is one of the six components of the benefits analysis. When flood waters inundate an area, commercial businesses may be forced to close and lose the opportunity to conduct business and earn revenue. ICF used a property-level analysis of businesses similar to residential property, to see which businesses would have had water above their first-floor elevations under various scenarios and storm types. ICF assumed that a business with water at or below its FFE would remain open and operate normally. We estimated commercial businesses' FFE in the same way as residential properties.

ICF did <u>not</u> estimate structural damages to commercial properties using DDFs in the fashion done above for residential property. See discussion in the **Error! Reference source not found.** section below.

ICF did not have access to operating revenue data from individual commercial businesses within the study area. ICF estimated commercial business disruption using survey data from the Census Bureau which required linking the "USECODE" designation from commercial businesses in the Parcels file to NAICS Codes.[15] In general, ICF determined a parcel as residential if it bore a USECODE with a value of 9 or lower. ICF determined USECODE values of 10 or higher were commercial, public, or some other multi-function property type. A full list of USECODEs from the parcels within our assessment areas is available in Appendix Table 2. ICF matched the USECODE of each commercial property to a NAICS code at either the sector, industry or sub-industry level that resembled the type of business most closely, by both comparing the descriptions of the USECODEs and NAICS codes and by looking up the addresses of a sample of businesses within each category in Google Maps® to confirm the business type. For example, we matched professional service buildings (USECODE 19) to professional, scientific, and technical services (NAICS 54), while single story stores (USECODE 11) were matched to other miscellaneous retail (NAICS 4539). Data on annual sales and revenue figures as well as the number of establishments by NAICS code and within Collier

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[13] ICF used a timeseries of median housing values from the 2009 to 2019 1-year ACS to derive the growth rate using the following API query across years: api.census.gov/data/2019/acs/acs1/profile?get=NAME,DP04_0089E&for=county:021&in=state:12.
[14] See table DP04. American Community Survey. U.S. Census Bureau. https://www.census.gov/programs-surveys/acs/data.html.
[15] "NAICS Code Drill-Down Table." NAICS Association. https://www.naics.com/search/.

County, FL (FIPS code 12021) were gathered from the 2017 Economic Census. For purposes of this calculation, ICF assumed all firms linked to a particular NAICS code in an assessment area behave in the same way as average firm from the NAICS would have, regardless of location, prior sales, or other factors specific to individual firms. While firm-specific factors may increase or decrease their lost revenue, ICF does not specify flood inundation impacts down to the individual firm level.

Estimation of Commercial Revenue Lost per Day

Using the methodology explained above ICF linked commercial business types to census data which estimated the annual revenue earned by firms within certain sectors. Once linked, ICF estimated the revenue per establishment per day within each business category by dividing the annual revenue of under each NAICS sector, industry or subsector by the corresponding number of establishments in that industry and then by 365 days.

Appendix Table 2 below presents the annual revenue, establishment, and per-day revenue estimates for Collier County, FL from the Census Bureau's Economic Census (ECN) data for 2017.[16] In later steps of the analysis ICF converted the 2017 dollars to 2023 dollars to be consistent with other benefits calculations.

[16] "ECN Core Statistics Summary Statistics for the U.S., States, and Selected Geographies: 2017." Table "ECN1700BASIC". U.S. Census Bureau. Released August 8, 2020. https://api.census.gov/data/2017/ecnbasic.

Appendix Table 2: Revenue Per Establishment Per Day Calculations (2017 Dollars)

USECODE	USECODE Name	NAICS Industry Name	NAICS Code	Number of Establishments A	Sales and Revenue ($1000) (2017 Dollars) B	Revenue Per Establishment C = B/A	Revenue Per Establishment Per Day D = C/365
11	Stores, one story	Other miscellaneous retail	4539	111	$87,691	$790,009	$2,164
12	Mixed use (store and resident)	Other miscellaneous retail	4539	111	$87,691	$790,009	$2,164
16	Community shopping centers	General merchandise stores, including warehouse clubs and supercenters	4523	36	$810,489	$22,513,583	$61,681
17	Office building, non-prof, one story	Professional, Scientific, and Technical Services	54	1,606	$1,108,844	$690,438	$1,892
18	Office building, non-prof, multi-story	Professional, Scientific, and Technical Services	54	1,606	$1,108,844	$690,438	$1,892
19	Professional service buildings	Professional, Scientific, and Technical Services	54	1,606	$1,108,844	$690,438	$1,892
20	Airports, bus term, piers, marinas	Transportation and warehousing	48-49	237	$214,389	$904,595	$2,478
21	Restaurants, cafeterias	Restaurants and Other Eating Places	7225	730	$1,029,518	$1,410,299	$3,864
22	Drive-in restaurants	Restaurants and Other Eating Places	7225	730	$1,029,518	$1,410,299	$3,864
23	Financial institutions	Securities, commodity contracts, and other financial investments and related activities	523	219	$461,452	$2,107,087	$5,773
26	Service stations	Automotive Parts, Accessories, and Tire Retailers	4413	55	$68,168	$1,239,418	$3,396
27	Equipment sales, repair, body shops	Automotive Parts, Accessories, and Tire Retailers	4413	55	$68,168	1,239,418	$3,396
29	Wholesale outlets, produce houses	General line grocery merchant wholesalers	42441	3	$1,978	$659,333	$1,806
30	Florist, greenhouses	Florists	4531	19	$7,345	$386,579	$1,059
35	Tourist attractions	Arts, Entertainment, and Recreation	71	248	$672,139	$2,710,238	$7,425
39	Hotels, motels	Accommodation	721	82	$863,002	$10,524,415	$28,834

USECODE	USECODE Name	NAICS Industry Name	NAICS Code	Number of Establishments A	Sales and Revenue ($1000) (2017 Dollars) B	Revenue Per Establishment C = B/A	Revenue Per Establishment Per Day D = C/365
41	Light manufacturing, small equipment	Machinery manufacturing	333	8	$21,264	$2,658,000	$7,282
43	Lumber yards, sawmills	Wood manufacturing	321	19	$30,691	$1,615,316	$4,426
48	Warehousing, distribution terminals	Transportation and warehousing	48-49	237	$214,389	$904,595	$2,478
49	Open storage, new and used buildings	Transportation and warehousing	48-49	237	$214,389	$904,595	$2,478
73	Privately owned hospitals	Hospitals	622	5	$755,378	$151,075,600	$413,906
77	Clubs, lodges, union halls	Accommodation and food services	72	881	$1,957,766	$2,222,209	$6,088

After calculating the per day per establishment revenue figures, ICF matched them to each commercial property so that daily revenue estimates were identified for all properties in the assessment areas. Using the net inundation levels for each property and the duration of flooding for each storm type (10 year and 25 year) as a ratio over 24 hours, we derived the revenue loss due to flooding disruptions for all properties. As the revenue figures were in 2017 dollars, ICF used the Federal Reserve Economic Data (FRED) timeseries of Personal Consumption Expenditure (PCE) price index to inflate the revenue losses to 2023 dollars at a rate of 2.27 percent.[17] ICF calculated the total expected commercial business disruption for the analysis period from 2040 to 2090. We then summed the expected revenue losses to estimate the total expected commercial business disruption under the two flooding scenarios.

Roadway Damages

Roadway damages are one of the components of the benefits estimation. When flood waters inundate an area, roadway segments may be submerged and unusable due to the flooding. ICF estimates expected damages to roadways which the city would have to pay to repair due to damage from flooding.

ICF's analysis identifies all affected roadway segments in the assessment areas as distinct assets and computes their elevation above the NAVD point. By overlaying the hydrological modelling from Kimley-Horn, ICF can see how many linear feet of each roadway segment may be flooded in each storm type for each condition set. For purposes of this analysis, ICF considers a linear food of roadway segment damaged if it is ever inundated, regardless of how high the flood waters on that segment rise.

ICF's analysis differentiates roadway segments by roadway class. This is to capture, broadly, the different costs the city would incur to replace that segment. The three classes are Arterial (major highways, interstates), Collector (smaller than arterial, but still busy), and Local (residential streets). ICF assesses a cost per linear foot of repair by roadway segment class as presented in Appendix Table 3.

Appendix Table 3: Roadway Costs to Repair

Class	Cost to Repair/ft (2022 Dollars)	Inflation Effects[18]	Cost to Repair / ft (2023 Dollars)
Arterial	$240	2.77 percent per year	$247
Collector	$180	2.77 percent	$185
Local	$60	2.77 percent	$62

[17] "Personal Consumption Expenditures: Chain-type Price Index, Index 2012=100, Monthly, Seasonally Adjusted". Federal Reserve Bank of St. Louis. https://fred.stlouisfed.org. ICF inflated the revenue losses to 2023 dollars by computing the compound average growth rate of the above PCE series from 2018 to 2021. ICF computed this growth rate was 2.27 percent per year.

[18] Inflation effects are calculated using the Bureau of Labor Statistics (BLS) Producer Price Index (PPI) dataset for the specific industry 32412 ('Asphalt paving and roofing materials mfg'). See "One Screen Data Search". BLS. https://data.bls.gov/PDQWeb/pc. ICF downloaded this source material from BLS and compared the price index for the given industry from August of 2013 to August 2023 and calculated the compound annual growth rate in prices. ICF's calculation of these values yielded 2.77% ((347.772 / 264.5) ^ (1/10) – 1).

For each roadway class and assessment area ICF summed the linear feet of roadway which was inundated under each storm type (10-Year and 25-Year) and condition set. ICF then multiplied each summed value for storm type and condition set by the appropriate risk-rate for the storm type (10 percent or 4 percent, respectively) for each of the 50 years within the analysis period. ICF then summed these values over 50 years for each storm type and condition set.

Property Value Impacts

ICF estimated changes in property values from a change in property or road elevation due to resilience investments. The Hedonic Model Development and Results section describes the hedonic pricing model used in this analysis in more detail. ICF used the "elev_mean" and "rdelev_mean_tract" coefficients for the All Sales hedonic model to calculate the property elevation impacts and road elevation impacts, respectively.

Because the hedonic model is log-linear the estimated coefficients ICF converted them to percentage points through an exponential transformation.[19] The adjusted coefficient values were then multiplied by the property value adjusted for inflation to 2023 and by the inundation delta. ICF calculated the flood inundation delta by subtracting the inundation level at each property under the investment scenario from the without investment scenario, to capture the difference in inundation that would occur due to resilience investments for each condition set.

While the estimated property elevation coefficient is not statistically significant at the 95 percent level in the hedonic model, ICF used this coefficient to estimate the impact of potential changes in inundation levels due to resilience investments on property values, and subsequently to estimate a complete property tax impact.

ICF used the cumulative effects of both the property elevation impacts and road elevation impacts on property values to calculate the tax revenue impacts (discussed below). However, ICF only included road elevation impacts in the calculation of the total benefits of resilience investments. ICF excluded property elevation impacts from total benefits as a result of potential double counting between the property damage analysis and the hedonic property value analysis, whereby storm damages on structural components could be counted twice. To estimate road elevation impacts on property values on an annual basis, ICF converted property values to annual rental equivalents. ICF multiplied the total value impacts due to road elevation by a discount rate of 3 percent to calculate the rental equivalents. ICF displays these rental equivalents as the value impact deltas in the summary of results in the Summary Results section below.

The estimated changes in property values and rental equivalents for road elevation and residential property elevation are presented in Appendix Table 4 and Appendix Table 5 below for both 10-year and 25-year storms under existing and future conditions.

[19] For example, the property elevation coefficient determined through hedonic price impact analysis is 0.0229 percent change per foot of flooding. However, this value was determined through log-linear regression. To properly scale this in linear terms, ICF applies an exponential transformation to the coefficient, defined as (e^(x) – 1) * 100%. In this case, the transformed value is 0.000229. This value is nearly identical to the coefficient after transformation, which is common for coefficients in log-linear analysis close to 0 due to the properties of the natural base function (e^x).

Appendix Table 4: 50 Year Total of Road Elevation Property Value Impacts for 10-Year and 25-Year Storms Under Existing and Future Conditions, (2023 Dollars in Thousands)

Storm type	Assessment Area	EC Value Impacts	EC Rental Equivalents	FC Value Impacts	FC Rental Equivalents
10-Year	A	$84,015	$2,520	$82,825	$2,485
	B	$11,594	$348	$15,687	$471
	C	$49,763	$1,493	$67,279	$2,018
	D	$5,356	$161	$9,651	$290
	E	$-	$-	$-	$-
	Total	**$150,728**	**$4,522**	**$175,443**	**$5,263**
25-Year	A	$53,936	$1,618	$25,480	$764
	B	$6,721	$202	$6,610	$198
	C	$28,832	$865	$28,480	$854
	D	$4,814	$144	$7,296	$219
	E	$-	$-	$-	$-
	Total	**$94,303**	**$2,829**	**$67,865**	**$2,036**
Grand Total	A	$137,951	$4,139	$108,306	$3,249
	B	$18,314	$549	$22,297	$669
	C	$78,596	$2,358	$95,759	$2,873
	D	$10,170	$305	$16,946	$508
	E	$-	$-	$-	$-
	Total	**$245,031**	**$7,351**	**$243,308**	**$7,299**

Appendix Table 5: 50 Year Total of Residential Property Elevation Property Value Impacts for 10-Year and 25-Year Storms Under Existing and Future Conditions, (2023 Dollars in Thousands)

Storm type	Assessment Area	EC Value Impacts	EC Rental Equivalents	FC Value Impacts	FC Rental Equivalents
10-Year	A	$5,908	$177	$6,751	$203
	B	$698	$21	$1,072	$32
	C	$6,453	$194	$8,473	$254
	D	$226	$7	$308	$9
	E	$5	$0	$105	$3
	Total	**$13,290**	**$399**	**$16,709**	**$501**
25-Year	A	$5,912	$177	$5,093	$153
	B	$378	$11	$581	$17
	C	$5,085	$153	$6,290	$189
	D	$211	$6	$220	$7
	E	$4	$0	$102	$3
	Total	**$11,591**	**$348**	**$12,287**	**$369**
Grand Total	A	$11,820	$355	$11,844	$355
	B	$1,076	$32	$1,654	$50
	C	$11,538	$346	$14,763	$443
	D	$437	$13	$528	$16
	E	$9	$0	$207	$6
	Total	**$24,881**	**$746**	**$28,996**	**$870**

Property Tax Impacts

ICF estimated the impacts that flooding scenarios may have on the tax collections of the City of Naples through residential personal property tax assessments. ICF calculated a value impact from flooding to estimate the effect flooding will have in reducing the value of the property tax base.

ICF treated tax revenue changes due to changes in the assessment value of property as an impact and not a damage, because residential property damages are already captured in another variable above. Instead, ICF classified tax revenue changes as impacts because they are derivative of changes in asset values already captured in the analysis.

First, ICF estimated a change in the property value, as described in the Property Value Impacts section of the appendix. Then, we derived tax revenue for residential property from a millage rate[20] applied to an assessed amount for real residential property. Appendix Table 6 presents the arithmetic average millage rate observed per assessment area. Using the estimated average millage rate for each assessment area estimated changes in residential property values, ICF calculated changes in tax revenues for each parcel, condition set, and storm type,

[20] ICF used the millage rates implied by the INT_MILLAGE_RATES and INT_MILLAGE files received from Collier county. ICF merged these millage rates onto the PARCELS file using the “mil_num” variable. ICF assumed these amounts in the “mil_total” variable represented annual property taxes due per $1,000 of assessed value.

and investment case. The results of this analysis are shown in the main text of the report above in Table 8.

Appendix Table 6: Arithmetic Mean of Total Millage (Tax per $1,000 of Assessed Value) Used by Assessment Area in Tax Revenue Impacts (2022 Rates)

Assessment Area	Mean Millage Rate
A	$10.26369
B	$10.2614
C	$10.2614
D	$10.2614
E	$10.2614

Summary Results

Appendix Table 7 below presents the estimated total benefits of resilience investments. These estimates are further decomposed to elaborate on the amount of expected damage estimated for each storm type, assessment area, and condition set, as well as the calculations for the difference, or delta, between the investment and no investment scenarios.

Appendix Table 7: 50 Year Total Damages for 10-Year and 25-Year Storms Under Existing and Future Conditions, (2023 Dollars in Thousands)

		Condition Sets				**Condition Sets**			
Storm type	**Assess Area**	**EC - No Inv**	**EC - Inv**	**EC - Value Impact Delta**	**EC Delta**	**FC - No Inv**	**FC - Inv**	**FC - Value Impact Delta**	**FC Delta**
		[A_{EC}]	**[B_{EC}]**	**[C_{EC}]**	**[D_{EC}] = [A_{EC}] - [B_{EC}] + [C_{EC}]**	**[A_{FC}]**	**[B_{FC}]**	**[C_{FC}]**	**[D_{FC}] = [A_{FC}] - [B_{FC}] + [C_{FC}]**
10-Year	A	$99,307	$90,265	$2,520	$11,563	$108,783	$90,615	$2,485	$20,653
	B	$8,928	$-	$348	$9,276	$72,926	$5	$471	$73,391
	C	$10,572	$6	$1,493	$12,059	$86,100	$38	$2,018	$88,080
	D	$3,367	$208	$161	$3,320	$41,046	$218	$290	$41,118
	E	$180	$29	$-	$151	$10,844	$358	$-	$10,486
	Total	**$122,355**	**$90,508**	**$4,522**	**$36,369**	**$319,698**	**$91,234**	**$5,263**	**$233,728**
25-Year	A	$43,061	$37,806	$1,618	$6,873	$46,366	$38,212	$764	$8,919
	B	$6,353	$546	$202	$6,008	$30,413	$726	$198	$29,886
	C	$22,233	$11	$865	$23,086	$35,614	$1,172	$854	$35,297
	D	$1,643	$313	$144	$1,475	$16,518	$206	$219	$16,531
	E	$96	$47	$-	$49	$4,337	$161	$-	$4,176
	Total	**$73,384**	**$38,722**	**$2,829**	**$37,491**	**$133,250**	**$40,477**	**$2,036**	**$94,809**
Grand Total	A	$142,368	$128,071	$4,139	$18,436	$155,149	$128,827	$3,249	$29,571
	B	$15,281	$546	$549	$15,284	$103,339	$731	$669	$103,277
	C	$32,805	$17	$2,358	$35,146	$121,714	$1,210	$2,873	$123,377
	D	$5,010	$521	$305	$4,794	$57,565	$425	$508	$57,649
	E	$275	$76	$-	$199	$15,181	$519	$-	$14,662
	Total	**$195,739**	**$129,230**	**$7,351**	**$73,860**	**$452,948**	**$131,711**	**$7,299**	**$328,536**

The summary results above show more detail on how the existing and future condition deltas were calculated in the Summary Results section above. Appendix Table 7 shows the total expected damage estimated for each assessment area, storm type and condition set aggregated over the four areas analyzed for damages, including property damage, commercial business disruption including the additional 90 days, and roadway damages, and property value impacts. For the first three (excluding property value impacts), an expected damage amount could be estimated directly for the existing and future conditions sets and no investment scenario. Separately the same expected damage figures could be estimated under the investment scenario. However, there is no sound method for estimating what the impact to property value is under *solely* the no investment or investment scenarios. As the hedonic appendix elaborates below, the measurement of this impact concerns the change to perception of property value due to the reduction in risk of flooding at that property. This impact only occurs after a change is made, therefore, ICF can only estimate its delta. Thus, the table reports a "Value Impact Delta" for both existing and future conditions to capture the portion of benefits attributable to property impacts. The total damages avoided, or benefits, is then the difference between the investment and no investment scenario for each condition set, assessment area, and storm type, *plus* the property impact delta.

Per-storm Damages

This section presents the per-storm damages estimates for a single 10-Year and 25-Year storm. **These results differ from those above in that they do NOT include risk and do NOT show expected benefits over 50 years. These estimates represent damages from a single storm event**. Due to this difference in reporting, the table below includes only three of the five sources of benefits from earlier summaries, Property Damages, Commercial Business Disruption, and Roadway Damages. Property value and property tax impacts are excluded because they cannot be reasonably adapted to per-storm damage amounts.

Appendix Table 8 below shows the per-storm damages predicted for the 10-Year and 25-Year storms for each assessment area and under each investment scenario. The subtotals by assessment area include Property Damage, Commercial Business Disruption, and Roadway Damage, but do not include property value and property tax impacts. Commercial Business Disruption is reported consistent with other summaries above to include an additional 90-days of closure. **These amounts should not be interpreted as annual impacts, nor simply scaled or multiplied by an updated expected frequency of such storms occurring.** It is possible to see a 10-Year storm back to back with a 25-Year storm, or even multiple storms of the same type within the same year.

Appendix Table 8: Per Storm Total Across Property Damages, Commercial Business Disruption, and Roadway Damages for 10-Year and 25-Year Storms Under Existing and Future Conditions, (2023 Dollars in Thousands)

Storm type	Assessment Area	EC - No Inv	EC - Inv	Costs Avoided	FC - No Inv	FC - Inv	Costs Avoided
10-Year	A	$16,602	$14,829	$1,773	$18,308	$14,897	$3,411
	B	$1,674	$-	$1,674	$13,173	$1	$13,172
	C	$2,073	$1	$2,072	$15,708	$7	$15,700
	D	$660	$41	$619	$6,971	$43	$6,928
	E	$35	$6	$30	$2,126	$70	$2,056

	Total	**$21,044**	**$14,876**	**$6,168**	**$56,286**	**$15,019**	**$41,267**
25-Year	A	$18,151	$15,575	$2,576	$19,707	$15,810	$3,897
	B	$3,000	$268	$2,732	$13,720	$356	$13,365
	C	$9,820	$6	$9,815	$16,219	$574	$15,645
	D	$805	$153	$652	$7,019	$101	$6,918
	E	$47	$23	$24	$2,126	$79	$2,047
	Total	**$31,823**	**$16,025**	**$15,799**	**$58,792**	**$16,920**	**$41,872**

Hedonic Model Development and Results

Introduction

Elevation within the City of Naples ranges from 0 to 19 feet above sea level, with the highest elevation downtown. The entire city is located in a Federal Emergency Management Agency (FEMA) flood zone, with the majority of the city in Zones AE, AH, and VE, which are classified as Special Flood Hazard Area (SFHA) and are expected to inundate during 100-year floods. The rest of the city is in FEMA flood zone X, which is classified as a moderate flood hazard area (FEMA, 2020). Thus, the City of Naples is highly prone to flooding, including tidal and tropical storm surge flooding (AECOM, 2018b). Based on the City of Naples' 2018 Stormwater Master Plan Update (AECOM, 2018b), Naples Bay annually reaches a high tide elevation of approximately 3.2 feet above mean sea level (MSL). Tropical storms and lesser category hurricane events (e.g., Category 1) can result in storm surges between 5 to 15 feet above MSL, while larger category hurricane events (e.g., Category 5) can reach up to 15 to 20 feet above MSL (AECOM, 2018a, 2018b).

The City of Naples has always been subject to intense thunderstorms, tropical storms, and hurricanes, but in recent years, the city has also become vulnerable to flooding resulting from climate change and sea-level rise.[21] In the past 20 years, the City of Naples has weathered several hurricanes, with wavelengths surging to nearly 5.5 feet at their highest. Storm surge data continue to trend upward, with 49 percent of the highest storm surges in 20 years occurring between 2016 and 2022 (NOAA, n.d.-c). **Error! Reference source not found.** below shows the monthly extreme water levels up to 2020. The monthly extreme water levels include a mean sea level trend increasing by 2.02 millimeters/year, equivalent to a change of 0.66 feet in 100 years. The figure shows the monthly highest and lowest water levels with the 1 percent, 10 percent, 50 percent, and 99 percent annual exceedance probability levels in red, orange, green, and blue, respectively (NOAA, n.d.-a). In addition to climate change resulting in more frequent and intense storm surge flooding, it is also causing the average sea level in Naples to rise by 3.27 millimeters/year, as shown in **Error! Reference source not found.** (NOAA, n.d.-b).

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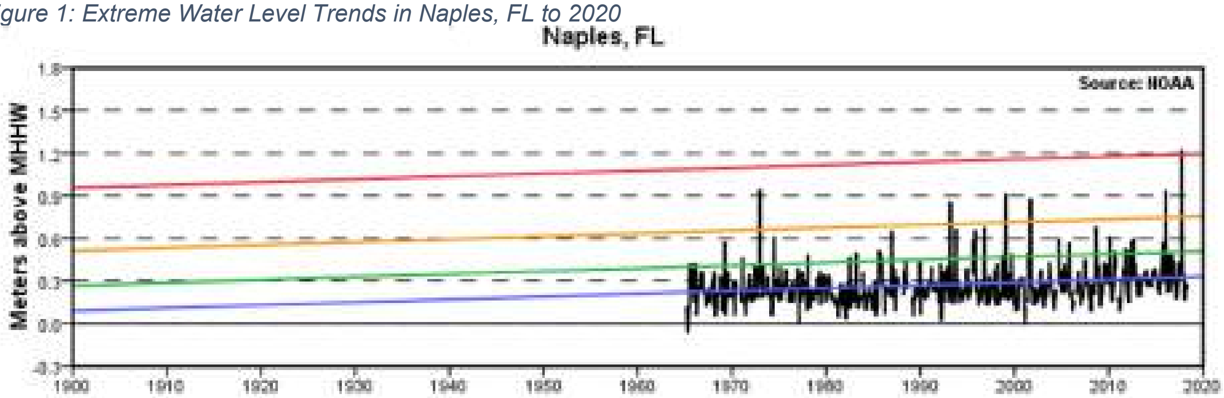
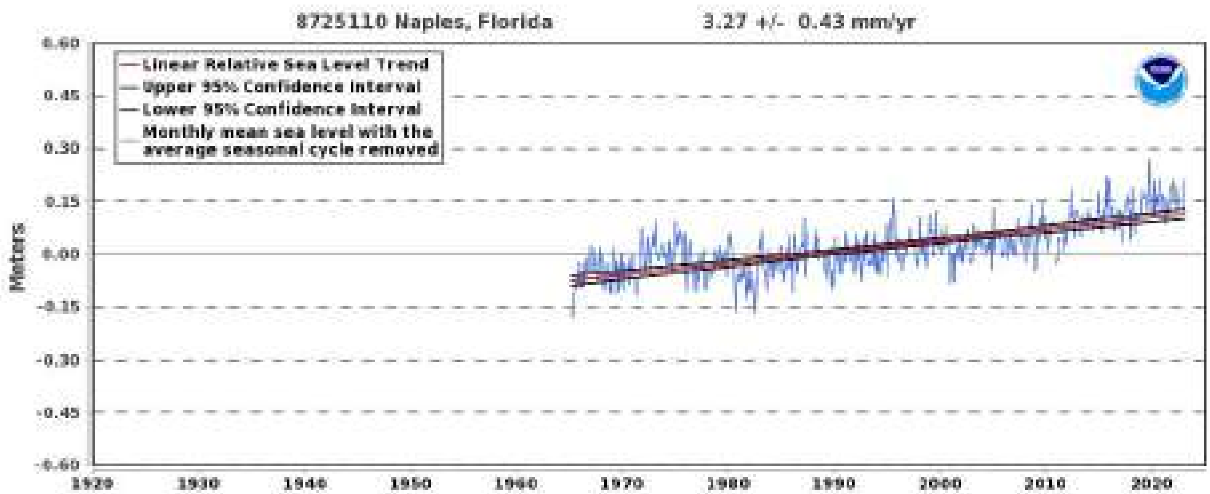
Figure 1: Extreme Water Level Trends in Naples, FL to 2020



Acronyms: MHHW- Mean Higher High Water
Note: Calculations based on monthly mean sea level data from 1965 to 2022 show a change of 1.07 feet in 100 years.

Figure 2: Relative Sea Level Trend in Naples, FL to 2022



Note: The relative sea level trend is 3.27 millimeters/year with a 95 percent confidence interval of +/- 0.43 mm/year based on monthly mean sea level data from 1965 to 2022, which is equivalent to a change of 1.07 feet in 100 years.

The City of Naples has responded by making significant investments to shore up its infrastructure and increase resilience to flooding events (AECOM, 2018a). Strengthening flood resilience in the City of Naples does not come cheaply, but the benefits have the potential to be considerable. For example, Hurricane Ian caused $2.2 billion in damages to Collier County, with 3,515 buildings sustaining major damage or destroyed entirely (Freeman, 2022). Reduction in expected flood damages from storm surge and inland flooding leads to multiple economic, social, and environmental co-benefits. In particular, more resilient communities benefit from higher property values, better financing options, and better insurance rates. As the City of Naples considers strategies to increase resilience to flooding and other extreme events, it needs to evaluate and compare the benefits of alternative investments, both to maximize what the investments will accomplish and to increase understanding and support from the City of Naples community. To support analysis of impacts from the city's investment in infrastructure on property values, ICF developed hedonic pricing models to estimate how the City of Naples' housing market reacts to flood risk.

Hedonic studies that investigate the effect of flood risk on property values have shown that home buyers respond to multiple signals of flood risk – including location in a designated flood zone, awareness of recent major flood events (defined by NOAA as indicating extensive inundation and property damage), predicted future tidal flooding, and parcel elevation. A number of studies showed that being located in a floodplain lowers property values (Bin et al., 2004; Bin, Kruse, et al., 2008; Bin, Thomas, et al., 2008, Atreya et al., 2013; Zhang, 2016). However, realized flood risks and economic effects (e.g., on housing values) for individual parcels have been shown to vary within areas of the same or similar SFHA designations (Bin & Czajkowski, 2013). For example, Johnston and Moeltner (2019) found that being in a designated SFHA had a greater effect on home prices near the coast than on home prices near water in interior regions.

Other studies found that simply being located in a floodplain was sometimes not enough to affect property values. Instead, decreases in home prices were driven by the experiences of recent flooding events, with negative price impacts diminishing over time (Bin & Landry, 2013; Atreya et al., 2015; Atreya et al., 2013; Zhang, 2016). In addition, there may be significant storm-surge exposure for homes outside of FEMA designated storm-surge risk zones (Bin & Czajkowski, 2013), and decreases in home prices may occur for such homes.

Two studies have previously assessed flooding risk effects in Florida. McAlpine et al. (2018) determined that Miami-Dade County properties that are projected to be flooded or near roads that will be flooded in 2032 have declined in value. Keenan et al. (2018) found that prices appreciated faster for Miami-Dade County homes at higher elevations since homes at lower elevations are more prone to flooding.

Our study examines the negative impacts of flood risk on both condo and single-family home prices in the City of Naples. Similar to Johnston and Moeltner (2019), we used elevation as a proxy for flood risk, as homes and roads at lower elevations are more prone to flooding than homes and roads at higher elevations. Given the frequency and severity of flooding in the City of Naples, as well as the media attention the flooding generates, home buyers are likely aware of the location of recent flooding events and factor this knowledge into their home purchasing decisions.

Methodology

When people consider a home to buy, they consider a multitude of characteristics that comes with that home. In addition to looking at the structure of the home, they also consider its location, its proximity to amenities and disamenities, the neighborhood culture, other personally important characteristics, and, in the case of the City of Naples, its likelihood of being flooded. The theory behind hedonic analysis is that after controlling for all factors that contribute to home prices, one can isolate how much people are willing to pay for a particular characteristic. Hedonic models are often used to estimate the effect of certain environmental attributes. In our case, we estimate the potential value of flood protection, using parcel and road elevation as proxies.

Following best practices from the hedonic literature, we developed three models (all homes, condos only, and single-family homes only) that estimate home prices as a function of three variable categories – household characteristics, neighborhood amenities, and flood protection that is expressed in terms of parcel and road elevation (hereafter, flood protection variables). Equation 1 describes the general hedonic equation for all three models. The dependent variable in this analysis is the price of arms-length[22] residential property sales between 1/1/2005 and 12/31/2019. Explanatory variables include the parcel and road elevation variables, housing/parcel and sales characteristics, and neighborhood characteristics.

$$\ln(Price) = \beta_0 + \beta_1(Parcel\ Elevation) + \beta_2(Census\ Tract\ Road\ Elevation) + \beta_3(Household\ Characteristics) + \beta_4(Neighborhood\ Amenities) + e_i$$

Equation 1

Where:

Parcel Elevation	=	Mean parcel elevation
Census Tract Road Elevation	=	Mean road elevation within the parcel's associated census tract
Household Characteristics	=	Set of household/parcel and sale characteristics
Neighborhood Amenities	=	Set of neighborhood characteristic variables

ICF used a log-linear functional form specification, where the dependent variable is logged and explanatory variables are untransformed.[23] This form accounts for a non-linear relationship between home prices and explanatory variables, including the flood protection variables.[24] The log-linear specification allows model coefficients to be interpreted as semi-elasticities, which represent the percent change in sale price for a unit change in the characteristic of interest.

Flood protection variables. We used the mean elevation of home parcels and mean elevation of roads within each parcel's associated census tract as proxies for flood risk protection, following the same intuition as Johnston and Moeltner (2019).[25] In other words, the more elevated the parcel or road, the more protected the home is likely to be from flooding. The mean elevation values for parcels and roads were used directly within the hedonic model. In preliminary models, ICF also tested various categories of flood protection based on the parcel's mean elevation being protective (i.e., has an elevation within the respective MSL ranges) of tidal flooding and storm surge flooding. Since the parcel elevation data within these flood risk protection categories contained little to no variability, these models performed poorly. Given these results, ICF chose to use simpler models that incorporate a parcel's mean elevation instead. Details on how ICF developed flood protection variables are discussed in Section A.4.

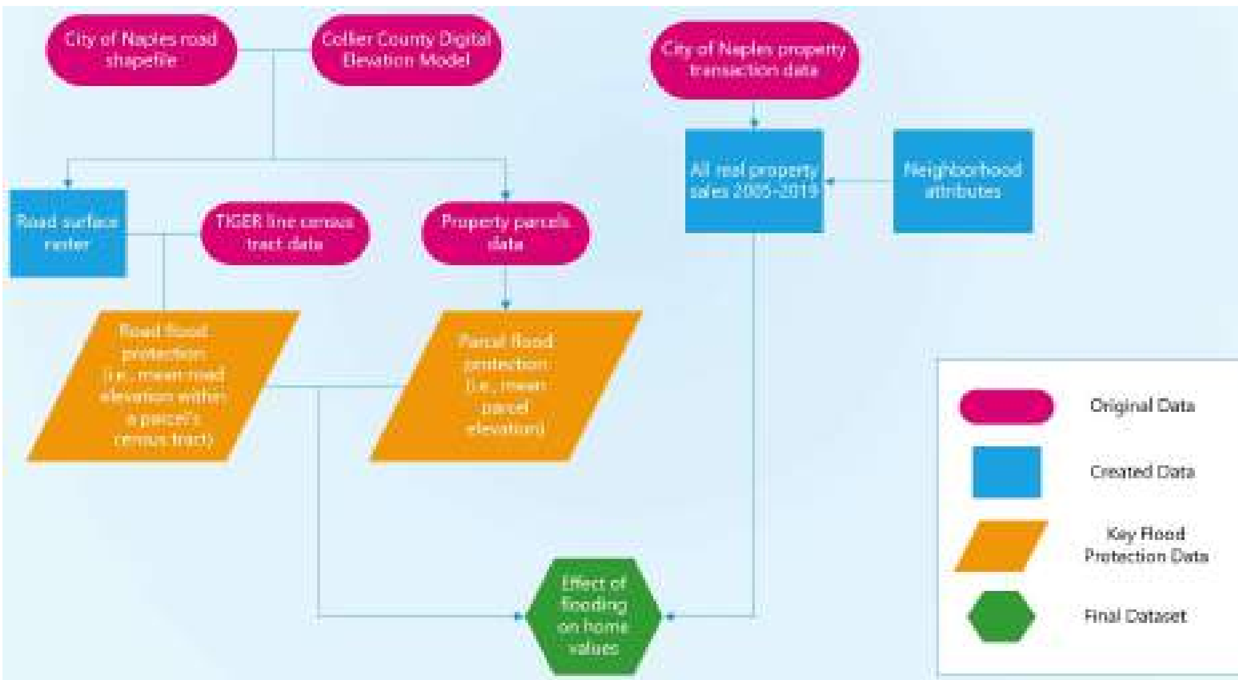
Housing/parcel and neighborhood characteristics. Housing/parcel characteristics include variables such as the total acres of the parcel, the age of the home, the livable square footage

[22] An arms-length sale is a transaction between an independent buyer and seller who do not have any relationship to each other. Both parties act out of self-interest, yielding a fair market value on the home price.
[23] Other hedonic studies utilizing a semi-logarithmic form include Atreya et al. (2013), Atreya et al. (2015), Bin, Kruse, et al. (2008); Bin et al. (2004); Bin, Thomas, et al. (2008), Kousky (2010), Meldrum (2016), Zhang (2016).
[24] Hedonic theory alone does not provide a basis for determining the most appropriate function form. Cropper et al. (1988) suggest linear form, semi-logarithmic, and double logarithmic forms instead of quadratic forms when some relevant explanatory variables are omitted. We tested these other forms, in addition to testing with a Box-Cox transformation, and semi-logarithmic provided the best statistical fit.
[25] ICF tested additional flood protection variables including variables that captured potential differential impacts of mean parcel and road elevation on sale price based on: (1) a home's binned distance from the ocean shoreline, and (2) a home's location in FEMA flood hazard zones. Additional information is available upon request.

of one story of the home, whether the home is a condo, whether the home has amenities such as a pool, carport, or deck, and the grade of the home.[26] ICF accounted for observable neighborhood characteristics by using a set of variables including homes' distances to the ocean and highways. The census tract variables in the model control for confounding spatial factors (for which we lack data to directly control for—i.e., omitted variable bias) that may influence both sale price and our key flood protection variables. Similarly, the year-of-sale variables in the model control for time trends that may influence sale price.

Data and processing flow. Hedonic price models rely on housing/parcel and sale characteristics data as well as geospatial data to account for flood protection and other neighborhood characteristics. **Error! Reference source not found.** illustrates how ICF processed data to create the final dataset.

Figure 3: Data Processing Steps for Creating the Final Dataset



To prepare a dataset for the hedonic analysis, ICF first conducted a series of data cleaning steps and then merged the housing sales and characteristics data with spatial variables. These steps are described in the *Hedonic Model Development Supplementary Materials*.

In the remainder of this appendix, Sections A.3 through A.5 provide details on variable specification and development, Section A.6 presents descriptive statistics for variables included in the hedonic models, Section A.7 presents hedonic model results, Section A.8 discusses the effects of the flood protection variables, and Section A.9 discusses the effects of housing and neighborhood characteristics.

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[26] A home's grade represents its quality, where quality is based on the materials used in construction and the complexity of the house.

Household/Parcel and Sale Characteristics

The City of Naples provided an extensive property sales and housing characteristics dataset obtained from the Collier County Property Appraisers office. The dataset included all sales transactions of all properties within Collier County from 1903 to 2022.The property sales and housing characteristics data are also publicly available through the property search tool on the Collier County website.[27]

To compile home sales and parcel characteristics data for this study, we eliminated all sales prior to year 2005 for several reasons: (1) the literature provides evidence that sea level rise has been occurring at a rapid pace as far back as the mid-2000's (see McAlpine et al. (2018) for a brief review of the literature), and (2) the data on geospatial and neighborhood characteristics prior to 2005 is limited. We also eliminated non-qualified sales,[28] non-residential sales, sales for which the sale year is earlier than the building construction by more than one year,[29] multi-family sales, sales with outlier sale prices,[30] and sales with incorrect or suspect housing characteristics (e.g., acreages of zero or one square footage of livable area). Following these cleaning steps, the final dataset had 11,174 observations. The *Hedonic Model Development Supplementary Materials* provides additional details about the cleaning steps.

The estimated hedonic models include a number of variables on housing and parcel characteristics, including lot size, home square footage, and home age at the time of sale. For single-family homes, the models also include variables for presence of a pool, carport, or deck. The housing dataset did not include data on extra features for condos.

As shown in **Error! Reference source not found.**, mean sale prices for condos and single-family homes vary over time. In addition to temporal trends, prices vary by census tract for both observable (e.g., demographics) and unobservable (e.g., cultural effects) reasons. We accounted for housing price trends with the inclusion of year-of-sale indicator variables. Additionally, we accounted for spatial variation in prices with the inclusion of census tract indicator variables.[31] Although the mean sale price for all sales (i.e., both condos and single-family homes) hovers between $1 and $2 million, sale prices across the City of Naples housing market show pronounced variability, with prices ranging from a low of $26,497 to a high of $9,949,129. Moreover, the figure indicates that, although condos and single-family homes follow similar temporal trends, single-family homes are consistently more expensive compared to condos. Prices for single-family homes ranged between $2 and $3 million whereas prices for condos ranged between $0.75 and $1.5 million.

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[27] https://www.collierappraiser.com/

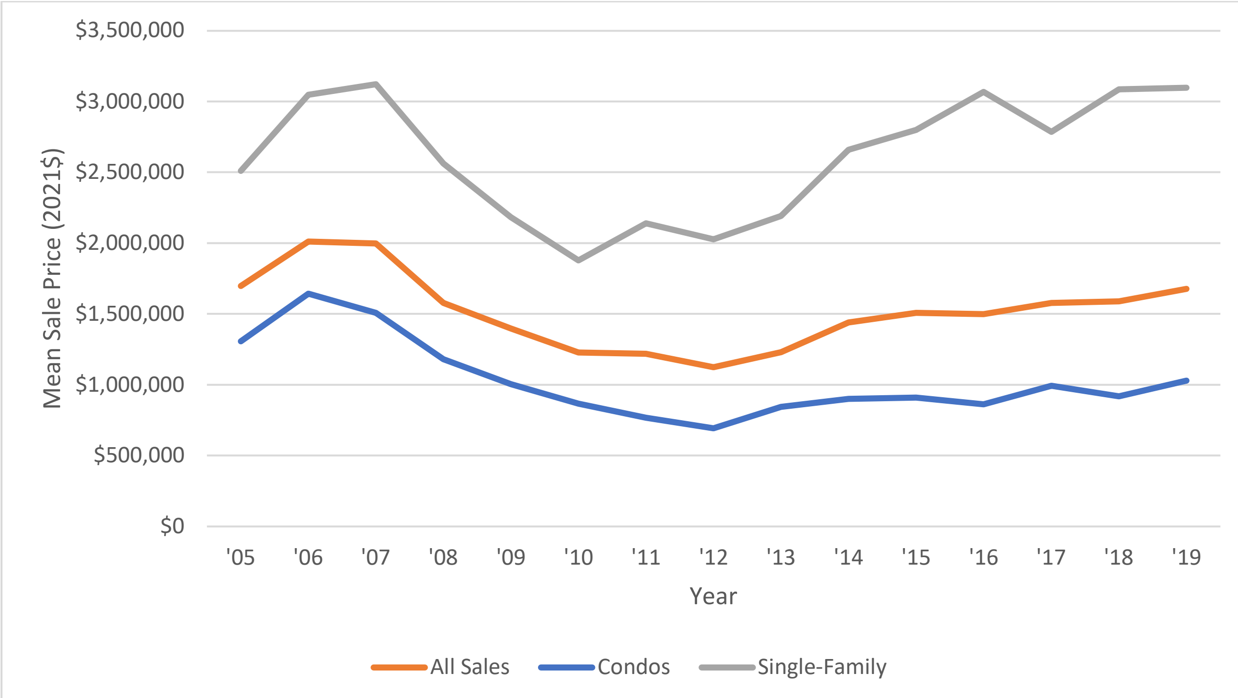
[28] The Collier County dataset includes a field that designates a sale as qualified or disqualified. Qualified sales are arms-length real property transfers, or normal transactions representing fair market value of the property. Disqualified sales are sales that do not represent fair market value of the property, such as transfers of properties to family members or to charitable organizations.

[29] We retained properties sold one year prior to the construction year to account for properties sold in housing developments prior to the completion of construction.

[30] These outliers are sales with prices higher than the 99th percentile value (approximately $10 million).

[31] Alternative iterations of the final model substituted the separate census tract and year-of-sale indicators with census tract by year-of-sale fixed effects. Although this model better accounted for differences in housing price trends within a census tract, it performed poorly with many of the census tract by year-of-sale indicators and key flood protection variables becoming statistically insignificant. Model results are included in *Hedonic Model Development Supplementary Materials*.

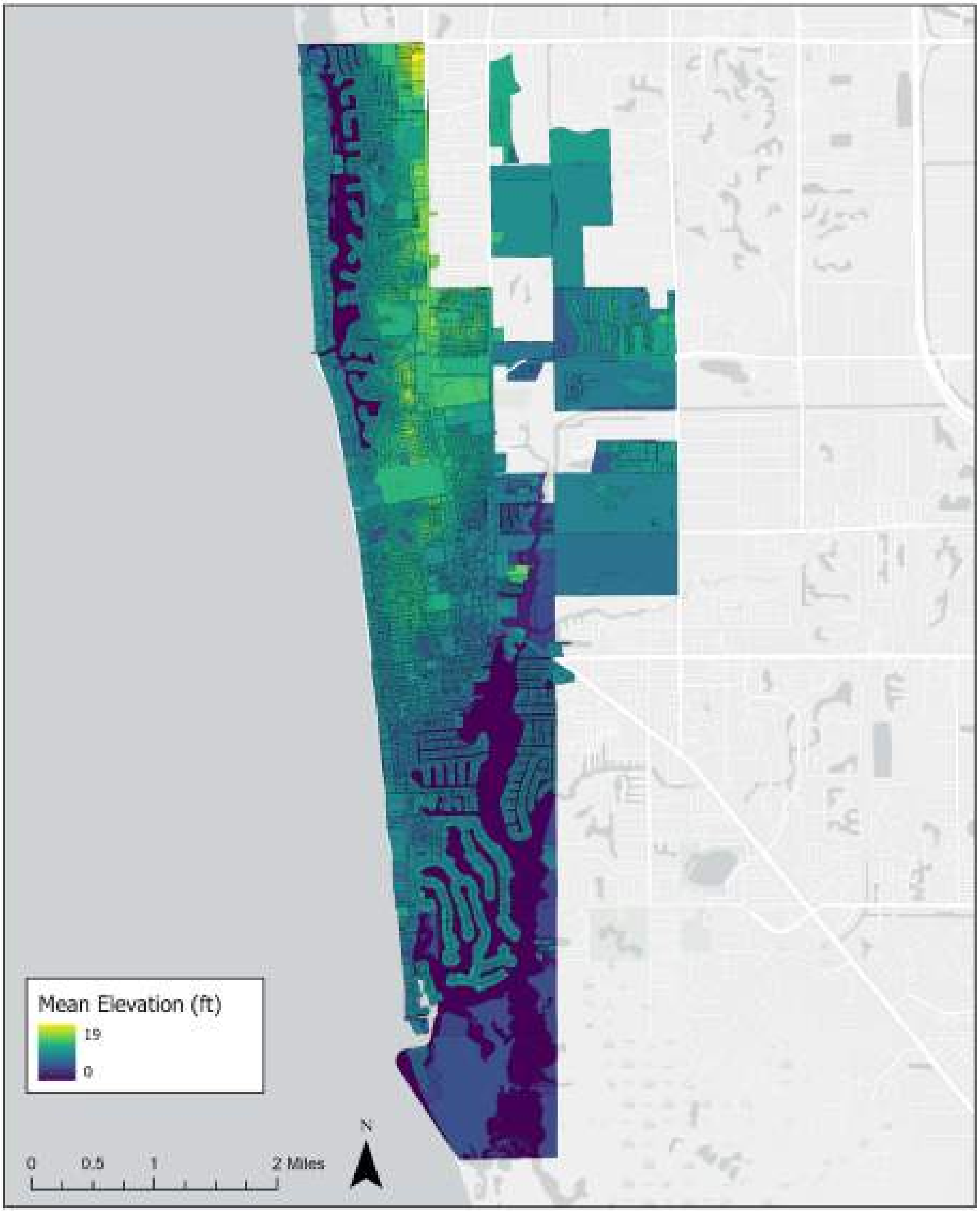
Figure 4: Mean Housing Price Trends for Homes Sold within the City of Naples from 2005 to 2019



Flood Protection Variables

ICF used mean parcel elevation (see **Error! Reference source not found.**) and mean road elevation within a given census tract as proxies for flood risk. The final hedonic models rely on the calculation of these flood protection variables using summary and zonal statistics, as mean elevation (especially for roads) was more representative of the parcel and its neighborhood. The use of mean elevations allowed for a continuous and informative measure of potential flood risk as it relates to land elevation. An additional advantage of using elevation as a proxy for flood risk is that elevation is easily observable by home buyers. **Error! Reference source not found.** shows that the range of elevation within the City of Naples was between 0 and 19 feet. The majority of the city has a relatively low elevation with higher elevation found in the downtown area. Approximately 85 percent of the city is designated as SFHA by FEMA, representing areas that will be inundated by a flood event having a 1-percent chance of being equaled or exceeded in any given year. The remaining 15 percent of the city is covered by areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood.

Figure 5: City of Naples Mean Parcel Elevation

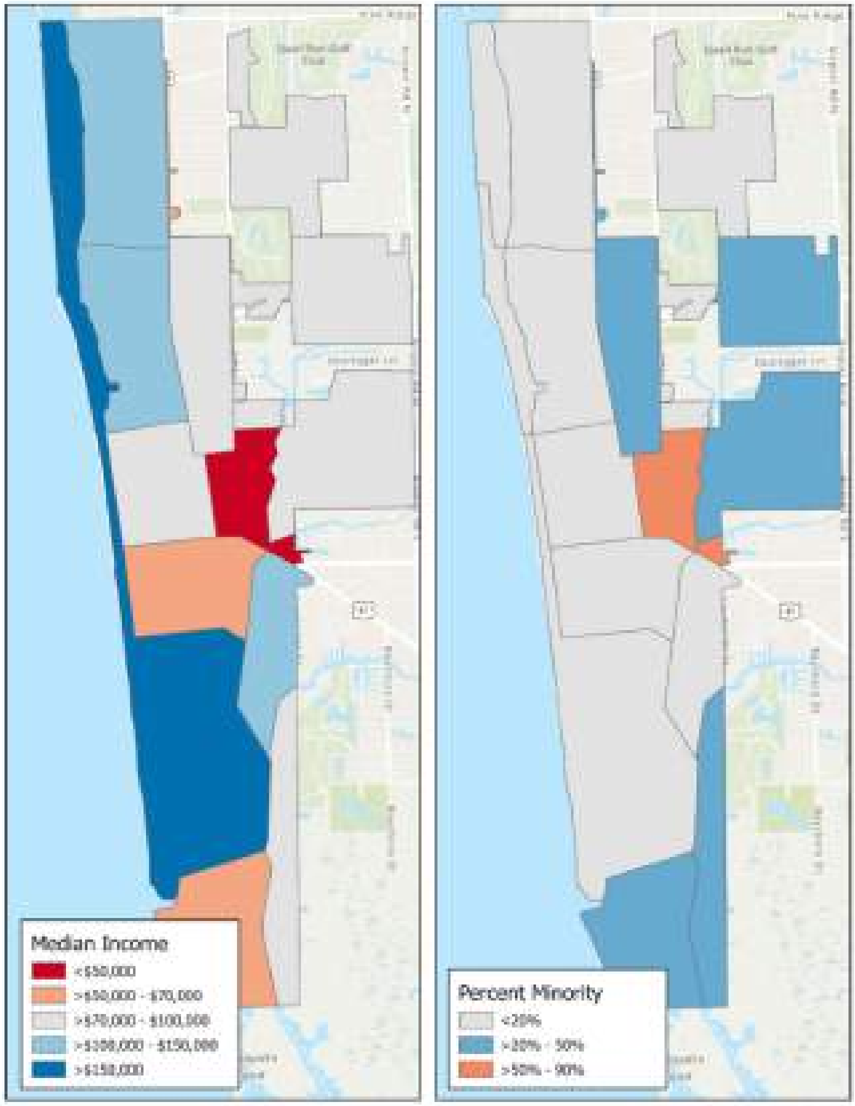


Neighborhood Characteristics

Census Tracts

ICF linked each parcel to a census tract. We did not utilize demographic variables at the census tract level because they are captured by the tract fixed effects. **Error! Reference source not found.** provides examples of the census tract-level variability for which the tract fixed effects control. The figures show the variability of percent of the population identifying as minority (anyone other than white alone, non-Hispanic) and median income. Tracts with high income population are located along the coast and in the areas with many bays, while the tracts with lower income population are found further inland and near the downtown neighborhood. The distribution of minority population reflects a similar pattern. Tracts with a lower percent minority are located along the coast, and tracts with a higher percent minority are found inland and in the downtown area. Additional tract-level variability captured by the tract fixed effects include percent of housing units that are owner-occupied and population density, as well as other omitted or unmeasurable characteristics.

Figure 6: City of Naples Census Tract Median Income and Percent of Tract Population Identifying as Minority



Neighborhood Amenities and Disamenities

Variables representing neighborhood amenities include distance to various neighborhood attributes, such as the ocean and highways, and a dummy variable[32] to indicate shorefront properties. ICF assigned neighborhood characteristics to physical parcels based on proximity to an amenity. Neighborhood amenities are shown in **Error! Reference source not found.**.

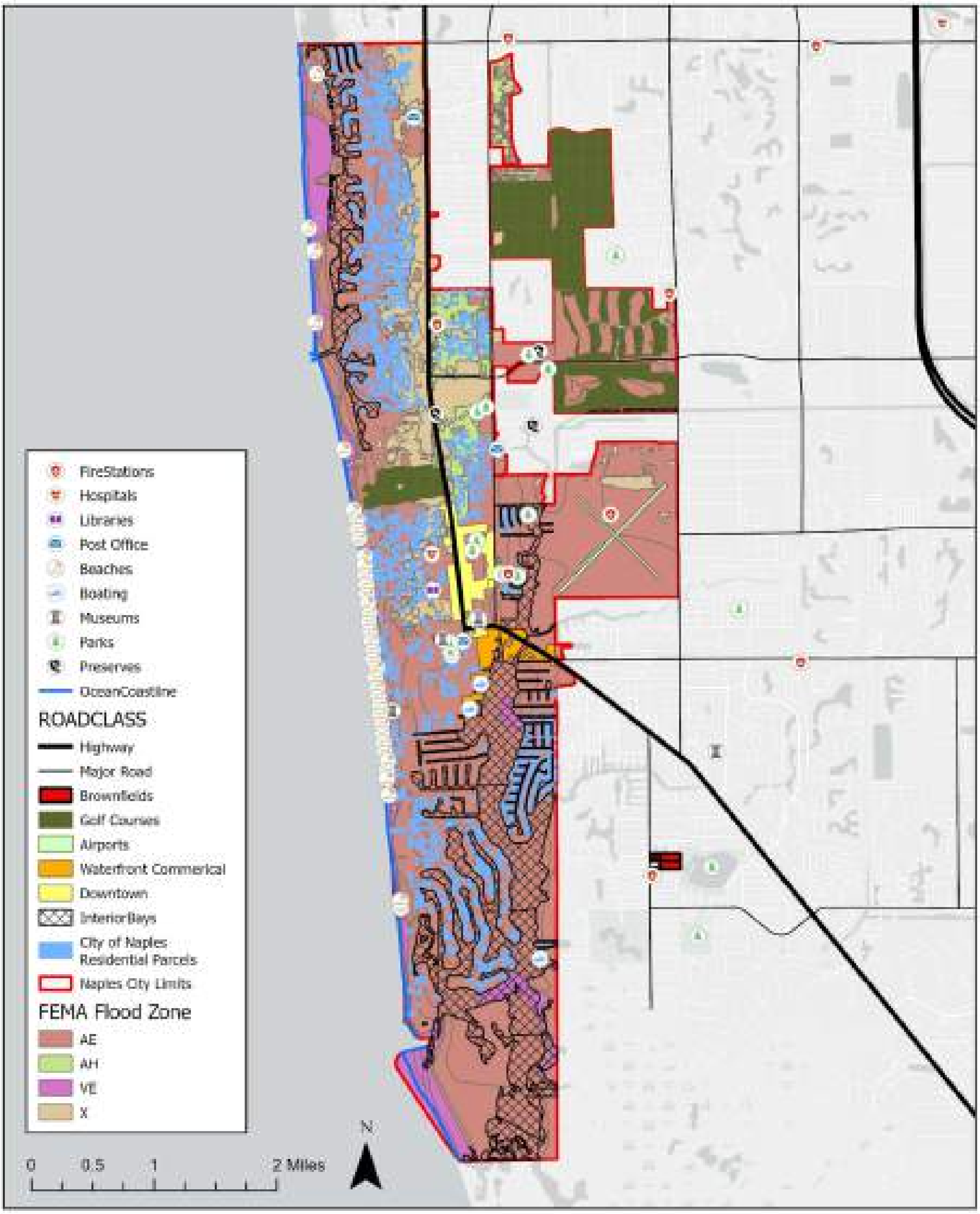
We tested several additional neighborhood characteristic controls—including distances to the nearest beach access point, commercial district, and park; school rank; crime rank; and walkability score—but eliminated them from the final models because of collinearity issues with other variables or low predictive power. For example, distance to the nearest beach access

[32] A “dummy” variable has values of either 0 or 1.

point was excluded from the models because of high correlation between beach location and the ocean shoreline.

Variables representing neighborhood disamenities include homes sold around the time of a storm or hurricane. A number of major storms and hurricanes occurred during the study period. Because these events may have a negative effect on the sale price of homes sold soon afterwards, we tested variables controlling for homes sold within 3 months, 6 months, and 12 months of a major storm or hurricane. We found these variables to be statistically insignificant and thus excluded them from our final models.

Figure 7: Distribution of Neighborhood Amenities throughout the City of Naples



Descriptive Statistics

Appendix Table 9 presents variable definitions and summary statistics for the dataset that includes all sales (i.e., sales of both single-family homes and condos). The dataset includes

11,174 sales in the City of Naples, Florida, which occurred between 1/1/2005 and 12/31/2019. Single-family homes and condos may have sold repeatedly throughout this timeframe. Of the sales that occurred during this time, 5,426 properties (49 percent) sold once, 4,077 properties (36 percent) sold twice, 1,360 properties (12 percent) sold three times, 280 properties (3 percent) sold four times, 25 properties (0.2 percent) sold five times, and 6 properties (0.05 percent) sold six times.

The mean price for single-family homes and condos sold between 2005 and 2019 is $1,496,885 ('*saleamount21*').[33] The median price for single-family homes and condos sold between 2005 and 2019 is $914,664. There is considerable variability in home prices, ranging from $26,497 to $9,949,129.

The vast majority of homes sold in the City of Naples during the study period are condos (69 percent), as indicated by the variable '*condo*'. Only 31 percent of sales are single-family homes. Single-family homes and condos have a mean acreage of 0.10 ('*totalacres*'), with 2,054 square feet of livable space ('*basearea*'). Single-family homes and condos are approximately 36 years old by 2022 ('*age*'). Twenty-three percent of single-family homes had pools ('*pool_sf*'), 1 percent had carports ('*carport_sf*'), and 21 percent had decks ('*deck_sf*').[34]

Twenty-three percent of homes sold were within 50 meters of the coast, as indicated by the variable '*coastal*'. Distance to the ocean ('*ocean*') ranges from 27.6 to 4,260.1 meters (90.6 to 13,976.7 feet), with a mean distance of 970.7 meters (3,184.5 feet). The closest home to a highway is 63.8 meters (209.2 feet) away, and the farthest is 4,549.2 meters (14,925.1 feet) away. The mean distance to a highway ('*highways*') is 982.1 meters (3,222.0 feet).

The mean parcel elevation ('*elev_mean*') is 2.1 meters (6.9 feet) with a range from -1.3 to 5.0 meters (-4.1 to 16.5 feet). We note that negative parcel elevations indicate that the parcel is below sea level. This was rarely the case in our dataset, with only 87 sale observations (less than 1 percent of all sales) being below sea level. The mean road elevation within each parcel's associated census tract ('*rdelev_mean_tract*') is 1.8 meters (5.7 feet) with a range from 1.3 to 2.7 meters (4.1 to 8.9 feet).

Appendix Table 9: Variable Definitions and Summary Statistics for All Sales

Variable	Definition	Mean	Std. dev.	Min	Max
Dependent Variable					
saleamount21	sale price in 2021$	$1,496,885	$1,611,952	$26,497	$9,949,129
Flood Protection Variables					
elev_mean	mean parcel elevation, in feet	6.92	2.38	-4.12	16.49
rdelev_mean_tract	mean road elevation within the census tract of a parcel, in feet	5.73	1.37	4.12	8.91
Housing Characteristics					
totalacres	legal acreage of the property	0.10	0.17	0.00	1.61
basearea	livable area of one story in square feet	2,054.17	1,323	279	72,296

[33] ICF converted sale prices to 2021$ using the Bureau of Labor Statistics' Consumer Price Index for All Urban Consumers (Bureau of Labor Statistics, 2023).
[34] The original housing sales data only provided information on extra features, such as pools and docks, for single-family homes (i.e., excludes condos).

Variable	Definition	Mean	Std. dev.	Min	Max
condo	1 = condo, 0 = otherwise	0.69	0.46	0	1
age	the age of the house by 2022.	35.78	17.03	2	121
age2	age*age	1,570.03	1,204.47	4	14,641
pool_sf [a]	1 = parcel has a pool, 0 = otherwise	0.23	0.42	0	1
carport_sf [a]	1 = parcel has a carport, 0 = otherwise	0.01	0.11	0	1
deck_sf [a]	1 = parcel has a deck, 0 = otherwise	0.21	0.41	0	1
grade_r5_bel_sf [a, b]	1 = grade of the home is below R-5+, 0 = otherwise	0.09	0.29	0	1
grade_rc1to10_sf [a, b]	1 = grade of home is between RC-1 and RC-10, 0 = otherwise	0.06	0.24	0	1
Neighborhood Characteristics					
highways	the distance from the parcel centroid to the highway, in meters	982.07	672.66	63.77	4,549.18
ocean	the distance from the parcel centroid to the ocean shoreline, in meters	970.65	857.50	27.60	4,260.11
coastal2	1 = parcel is within 50 meters of either the ocean shoreline or inner bays	0.23	0.42	0	1
Temporal Characteristics					
yr_XX [c]	1 = house was sold in the year 'XX, 0 = otherwise				
Spatial Characteristics					
tract_XXXXX [d]	1 = house is located in census tract XXXXX, 0 = otherwise				

[a] Variable only pertains to single-family homes.
[b] "R" signifies "residential" while "RC" signifies "residential custom." Higher numbers pertain to higher quality homes. Quality is based on the quality of materials used in construction and the complexity of the house. Rankings from lowest quality to highest quality are as follows: R-0 to R-5+, RC-1 to RC-100.
[c] All models include 14 year-of-sale indicators for sales which occurred between 2005 and 2019.
[d] All models include 10 census tract indicators.
N = 11,174

Model Results

Appendix Table 10 presents regression results for three different models. The 'All Sales Model' includes both condos and single-family homes in our dataset. The 'Condo Only Model' includes only condos, which represent 69 percent of all sales in the final dataset. The 'Single-Family Only Model' includes only single-family homes, representing the remaining 31 percent of the dataset. The 'Condo Only Model' specification excludes several house characteristic variables (*pool_sf*, *carport_sf*, *deck_sf*, *grade_r5_bel_sf*, and *grade_rc1to10_sf*) since this information is not recorded for condos. Both the 'Condo Only Model' and 'Single-Family Only Model' specifications exclude the '*condo*' variable since this variable is equal to 1 for all observations in the 'Condo Only Model' and equal to 0 for all observations in the 'Single-Family Only Model').

The statistical fit of the estimated models is good. Model results suggest a significant systematic component of sale price variation associated with housing, neighborhood, flood protection, temporal, and spatial census tract characteristics. The 'Condo Only Model' has an R^2 of 0.81, the 'Single-Family Only Model' has an R^2 of 0.87, and the 'All Sales Model' has an R^2 of 0.83. These R^2 values indicate that the models are predicting 81, 87, and 83 percent of the variation in sale prices, respectively. Our adjusted R-squared values are within the range of values found in the hedonic flood literature. For example, models from McAlpine et al. (2018), Zhang (2016), and Kousky (2010) yielded adjusted R-squared values of 0.51, 0.76, and 0.83 respectively.

The coefficients on explanatory variables across all models are of the expected sign, though some differences in magnitude show differences in preferences between buyers of condos and standalone homes. Because we use a log-linear functional form, the estimated coefficients represent percentage point increase in the home price per unit change in the explanatory variables. For example, a one square foot increase in living area leads to a 0.02 percent increase in home price.

Given that key results are generally consistent across the three models, we suggest applying the 'All Sales Model' for both condos and single-family homes to support assessment of changes in housing prices due to the City's investment in flood protection.

Appendix Table 10: Regression Results (Dependent Variable = log[salesprice21])

	Condo Only Model	**Single-Family Only Model**	**All Sales Model**
elev_mean	0.0281 (0.064)	0.000273 (0.00883)	0.0229 (0.0150)
rdelev_mean_tract	0.742*** (0.223)	0.451*** (0.0387)	0.766*** (0.167)
basearea	0.000222 (0.000125)	0.0000926*** (0.0000156)	0.000238* (0.000111)
age	-0.0264*** (0.00879)	-0.0147*** (0.00335)	-0.0351*** (0.00684)
age2	-0.000009 (0.00008)	0.000154*** (0.0000384)	0.000231*** (0.0000719)
totalacres		0.817*** (0.102)	0.392 (0.431)
condo			-0.111 (0.117)
pool_sf		0.406*** (0.0635)	0.428*** (0.0693)
carport_sf		0.144*** (0.0344)	0.194** (0.0635)
deck_sf		0.135*** (0.0219)	0.124*** (0.0325)
grade_r5_bel_sf		-0.379*** (0.0338)	0.311** (0.105)
grade_rc1to10_sf		-0.236*** (0.0339)	0.207*** (0.0626)
ocean	-0.000669*** (0.000101)	-0.000336*** (0.0000529)	-0.000671*** (0.0000929)

	Condo Only Model	Single-Family Only Model	All Sales Model
highways	0.000558** (0.000217)	0.000105*** (0.0000270)	0.000228* (0.000106)
coastal2	0.296*** (0.0952)	0.378*** (0.0625)	0.280*** (0.0768)
constant	9.801*** (1.083)	12.04*** (0.321)	10.25*** (0.800)
N	7,692	3,482	11,174
R^2	0.81	0.87	0.83
Adjusted R^2	0.80	0.87	0.83

Note: All models include 14 year-of-sale indicators and 10 census tract fixed effects. Standard errors are in parentheses. *, **, and *** represent significance at the 10, 5, and 1 percent level, respectively.

Effect of Flood Protection Variables

As noted above, the coefficients on the flood protection variables, *elev_mean* and *rdelev_mean_tract*, represent the change in home price for a one-foot increase in the mean elevation of the parcel and a one-foot increase in the mean elevation of roads within the parcel's census tract, respectively. All three models tell a similar story, with positive and statistically significant coefficients on the mean elevation of roads within the home's associated census tract ('*rdelev_mean_tract*') and positive but not statistically significant coefficients on the parcel's mean elevation ('*elev_mean*').[35]

Model results show that home buyers are willing to pay a premium for the additional flood protection benefits afforded by roads. For example, homeowners would have a reduced risk of losing road access to amenities and necessities (e.g., beaches, hospitals) in an area with higher elevated roads. Based on the 'All Sales Model', a one-foot increase in the mean elevation of roads within a home's associated census tract results in a 0.77 percent increase in housing price.[36] For an average City of Naples home in our dataset, which is valued at approximately $1,496,885, a one-foot increase in nearby roads elevation corresponds to an increase in property value of $11,526.

The estimated models show the potential for what the City of Naples stands to gain from efforts to increase road elevations throughout the city. Increased property values from improved flood protection not only benefit homeowners, but also the city through an increased tax base and prevention of future flooding damages and traffic disruption.

Effects of Housing and Neighborhood Characteristics

Many of the other explanatory variables representing housing and neighborhood characteristics in the models have relationships with sale prices that are in line with expectations. For example, the distance to highways variable ('*highways*') has a positive and statistically significant effect, which means that home prices increase as they are located farther away from the highway. The positive sign for square footage ('*basearea*') indicates that as square footage increases, so do home prices. However, the effect of square footage on housing price is different for condos and

[35] This result is not statistically significant with P<0.15. ICF retained the parcel elevation variable for model application purposes. We expect that the City of Naples' resiliency measures will involve parcel level improvements as well as road elevation improvements.
[36] This coefficient is statistically significant with P<0.01.

single-family homes. The variable is statistically insignificant in the ‘Condo Only’ model, whereas in the ‘Single-Family Only’ model, mean home price increases by 0.0001 percent for a one square footage increase in livable space. We also found differences in the influence of a home’s age on sale prices between the models. In the ‘Single-Family Only’ and ‘All Sales’ models, the negative sign on ‘*age*’ and the positive sign on ‘*age2*’ indicate that older homes are less expensive, but decreasingly so as the age of the home increases. In contrast, the relationship between a home’s age and its sale price is more linear in the ‘Condo Only’ model (as indicated by the significant effect of ‘*age*’ and the insignificant effect of ‘*age2*’). The reason for this difference is unclear. It may be due to differences in the cost of maintenance and upkeep between older single-family homes and older condos. Lastly, we also found that, for single-family homes, sale prices increase with the presence of a pool, carport, and deck (as indicated by positive and statistically significant coefficients on ‘*pool_sf,’ carport_sf,’* and ‘*deck_sf*’).

Model results also show that homes closer to the ocean shoreline are more expensive (as indicated by the negative and statistically significant coefficient on ‘*ocean*’ and positive and statistically significant coefficient on ‘*coastal2*’). This aligns with expectations as homeowners may consider beaches along the ocean shoreline and the views from waterfront properties to be amenities. In contrast, homes closer to the highway are less expensive (as indicated by the positive and statistically significant coefficient on ‘*highways*’). This may be because homeowners consider the noise pollution generated by highways to be a disamenity.

Hedonic Model References

AECOM. (2018a). City of Naples' 2018 Stormwater Master Plan Update.

AECOM. (2018b). *Stormwater Master Plan Update: City of Naples*. Retrieved from https://www.naplesgov.com/sites/default/files/fileattachments/streets_amp_stormwater/page/24001/final_2018.stormwater_master_plan_update.pdf

Atreya, A., & Ferreira, S. (2015). Seeing is Believing? Evidence from Property Prices in Inundated Areas. *Risk Anal, 35*(5), 828-848. doi:10.1111/risa.12307

Atreya, A., Ferreira, S., & Kriesel, W. (2013). Forgetting the Flood? An Analysis of the Flood Risk Discount over Time. *Land Economics, 89*(4), 577-596.

Bin, O., & Czajkowski, J. (2013). The impact of technical and non-technical measures of water quality on coastal waterfront property values in South Florida. *Marine Resource Economics, 28*(1), 43-63.

Bin, O., Kruse, J. B., & Landry, C. E. (2008). Flood Hazards, Insurance Rates, and Amenities: Evidence from the Coastal Housing Market. *The Journal of Risk and Insurance, 75*(1), 63-82.

Bin, O., & Landry, C. E. (2013). Changes in implicit flood risk premiums: Empirical evidence from the housing market. *Journal of Environmental Economics and Management, 65*(3), 361-376. doi:https://doi.org/10.1016/j.jeem.2012.12.002

Bin, O., & Polasky, S. (2004). Effects of Flood Hazards on Property Values: Evidence before and after Hurricane Floyd. *Land Economics, 80*(4), 490-500. doi:10.2307/3655805

Bin, O., Thomas, W. C., Jamie, B. K., & Craig, E. L. (2008). Viewscapes and Flood Hazard: Coastal Housing Market Response to Amenities and Risk. *Land Economics, 84*(3), 434. doi:10.3368/le.84.3.434

Bureau of Labor Statistics. (2023). CPI for All Urban Consumers (CPI-U). Retrieved from https://www.bls.gov/cpi/data.htm

Cropper, M. L., Deck, L. B., & McConnell, K. E. (1988). On the choice of funtional form for hedonic price functions. *The Review of Economics and Statistics*, 668-675.

FEMA. (2020). Flood Zones. Retrieved from https://www.fema.gov/glossary/flood-zones

Freeman, L. (2022). Damage from Hurricane Ian at $2.2 billion in Collier; more than 3,500 buildings face major damage. Retrieved from https://www.naplesnews.com/story/weather/hurricanes/2022/10/11/hurricane-ian-damage-2-2-billion-collier-naples-marco-island/10466660002/

Johnston, R. J., & Moeltner, K. (2019). Special Flood Hazard Effects on Coastal and Interior Home Values: One Size Does Not Fit All. *Environmental and resource economics, 74*(1), 181-210. doi:10.1007/s10640-018-00314-7

Johnston, R. J., & Moeltner, K. (2019). Special flood hazard effects on coastal and interior home values: One size does not fit all. *Environmental and resource economics, 74*, 181-210. doi:https://doi.org/10.1007/s10640-018-00314-7

Keenan, J. M., Hill, T. C. B., & Gumber, A. (2018). Climate gentrification: from theory to empiricism in Miami-Dade County, Florida. *Environmental Research Letters, 13*.

Kousky, C. (2010). Learning from extreme events: Risk perceptions after the flood. *Land Economics, 86*(3), 395-422.

McAlpine, S. A., & Porter, J. R. (2018). Estimating Recent Local Impacts of Sea-Level Rise on Current Real-Estate Losses: A Housing Market Case Study in Miami-Dade, Florida. *Popul Res Policy Rev, 37*(6), 871-895. doi:10.1007/s11113-018-9473-5

Meldrum, J. R. (2016). Floodplain price impacts by property type in Boulder county, Colorado: Condominiums versus standalone properties. *Environmental and resource economics, 64*, 725-750.

NOAA. (n.d.-a). NOAA Extreme Water Levels. Retrieved from https://tidesandcurrents.noaa.gov/est/est_station.shtml?stnid=8725110

NOAA. (n.d.-b). NOAA Sea Level Trends. Retrieved from https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8725110

NOAA. (n.d.-c). NOAA Tide Predictions. Retrieved from https://tidesandcurrents.noaa.gov/noaatidepredictions.html?id=8725110

Zhang, L. (2016). Flood hazards impact on neighborhood house prices: A spatial quantile regression analysis. *Regional Science and Urban Economics, 60*, 12-19. doi:https://doi.org/10.1016/j.regsciurbeco.2016.06.005