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STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

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January 31, 2022

Ref.: PO-22-030

Memorandum

To: Councilmember Tamara Paltin, Chair Committee on Planning and Sustainable Land Use Committee

Thru: William J. Aila Jr., Chairman Hawaiian Homes Commission *WJA*

From: Stewart Matsunaga, Acting Administrator DHHL Land Development Division *SM*

Andrew H. Choy, Acting Administrator DHHL Planning Office *AC*

Re: Follow-up on Information Requests Regarding DHHL West Maui Developments from the January 24, 2022 Planning and Sustainable Land Use Committee Meeting

Mahalo nui for the opportunity to provide information regarding DHHL West Maui development projects to the Maui County Council Committee on Planning and Sustainable Land Use Committee. During the meeting, there were several information requests of DHHL from committee members that we indicated we would provide later. The following provides the information that was requested of DHHL by the committee members. Please distribute this memorandum to your fellow committee members. Should you or other committee members have additional questions or information requests, please feel free to reach out to us at any time.

1. **How much federal funding does DHHL anticipate receiving for County of Maui projects from the "Build Back Better Bill" that is currently going through the legislative process in Congress?**

As the legislation is still being deliberated by Congress, DHHL cannot say with any certainty whether it will receive any federal funding or how much of that funding would be for its Maui County projects.

2. **How much water will DHHL need for its West Maui Homestead Development Projects?**

DHHL Development	Number of Agriculture Lots	Number of Residential Units	Estimated Potable Water Demand (Million Gallons Per Day (MGD))
Leiali'i Phase 1B Increment 1	0	86	0.0774
Leiali'i Phase 1B Increment 2	0	164*	0.1378
Honokōwai	252	929**	0.94968
TOTAL	252	1,093	1.6488

*Assumes 164 multi-family units will be developed in Increment 2; However, at this time, DHHL is also contemplating 95 single-family lots as an alternative in which case, the estimated potable water demand would be 0.085 MGD.

**Includes estimated 573 multi-family lots will be developed in Honokōwai

3. Which aquifer will DHHL's new Honokōwai well be located in?

DHHL's planned new well will be located in the Honokōwai Aquifer System Area. The state Commission on Water Resource Management estimates the sustainable yield of this aquifer at approximately 6 MGD.

4. Please provide more information on DHHL's R-1 needs so that the County can better collaborate with DHHL on these improvements.

See enclosed DHHL Preliminary Engineering Report for Honokōwai homestead development. Note DHHL selected ALTERNATIVE C as its preferred alternative in its Final Environmental Assessment for the Honokōwai homestead development.

Enclosure

PRELIMINARY INFRASTRUCTURE ANALYSIS REPORT
FOR
DHHL HONOKOWAI MASTER PLAN

Honokowai, Maui, Hawaii

**T.M.K.s: (2) 4-4-001:015 and
(2) 4-4-002:003, 008, 009, 011, 015, 018 & 038**

Prepared for:

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TABLE OF CONTENTS

1.0 INTRODUCTION

2.0 EXISTING INFRASTRUCTURE

- 2.1 ROADWAYS
- 2.2 DRAINAGE
- 2.3 SEWER
- 2.4 WATER
- 2.5 ELECTRIC

3.0 ANTICIPATED INFRASTRUCTURE IMPROVEMENTS

- 3.1 ROADWAYS
- 3.2 DRAINAGE
- 3.3 SEWER
- 3.4 WATER
- 3.5 ELECTRIC

4.0 PREFERRED ALTERNATIVE

EXHIBITS

- 1 LOCATION MAP
- 2 VICINITY MAP
- 3 SOIL SURVEY MAP
- 4-A FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-001:015)
- 4-B FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:003)
- 4-C FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:008)
- 4-D FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:009)
- 4-E FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:011)
- 4-F FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:015)
- 4-G FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:018)
- 4-H FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:038)
- 5 EXISTING LAND SLOPE
- 6 RAINFALL ISOHYET MAP
- 7 SOIL CLASSIFICATION MAP
- 8 EXISTING ONSITE UTILITIES
- 9 EXISTING OFFSITE SEWER INFRASTRUCTURE
- 10 EXISTING OFFSITE WATER INFRASTRUCTURE
- 11 EXISTING OFFSITE DRAINAGE INFRASTRUCTURE
- 12 ALTERNATE A – PROPOSED SEWER SYSTEM & R-1 WATER MAP
(IWS FOR 1 TO 2 ACRE AG LOTS)
- 13 ALTERNATE A – PROPOSED SEWER SYSTEM & R-1 WATER MAP
(NO IWS)
- 14 ALTERNATE A – PROPOSED WATER SYSTEM MAP
- 15 ALTERNATE A – PROPOSED DRAINAGE SYSTEM MAP

- 16 ALTERNATE B – PROPOSED SEWER SYSTEM & R-1 WATER MAP
(IWS FOR 1 TO 2 ACRE AG LOTS)
- 17 ALTERNATE B – PROPOSED SEWER SYSTEM & R-1 WATER MAP
(NO IWS)
- 18 ALTERNATE B – PROPOSED WATER SYSTEM MAP
- 19 ALTERNATE B – PROPOSED DRAINAGE SYSTEM MAP
- 20 ALTERNATE C – PROPOSED SEWER SYSTEM & R-1 WATER MAP
(IWS FOR 1 TO 2 ACRE AG LOTS)
- 21 ALTERNATE C – PROPOSED SEWER SYSTEM & R-1 WATER MAP
(NO IWS)
- 22 ALTERNATE C – PROPOSED WATER SYSTEM MAP
- 23 ALTERNATE C – PROPOSED DRAINAGE SYSTEM MAP
- 24 ALTERNATE C (PHASE I) – PROPOSED SEWER SYSTEM & R-1
WATER MAP (IWS FOR 1 TO 2 ACRE AG LOTS)
- 25 ALTERNATE C (PHASE I) – PROPOSED SEWER SYSTEM & R-1
WATER MAP (NO IWS)
- 26 ALTERNATE C (PHASE I) – PROPOSED WATER SYSTEM MAP
- 27 ALTERNATE C (PHASE I) – PROPOSED DRAINAGE SYSTEM MAP
- 28 ALTERNATE C (PHASE II) – PROPOSED SEWER SYSTEM & R-1
WATER MAP (IWS FOR 1 TO 2 ACRE AG LOTS)
- 29 ALTERNATE C (PHASE II) – PROPOSED SEWER SYSTEM & R-1
WATER MAP (NO IWS)
- 30 ALTERNATE C (PHASE II) – PROPOSED WATER SYSTEM MAP
- 31 ALTERNATE C (PHASE II) – PROPOSED DRAINAGE SYSTEM MAP

APPENDICES

- A HYDROLOGIC CALCULATIONS
- B DOMESTIC WATER DEMAND CALCULATIONS
- C WASTEWATER CALCULATIONS
- D ORDER OF MAGNITUDE COST ESTIMATES

**PRELIMINARY INFRASTRUCTURE ANALYSIS REPORT
FOR
DHHL HONOKOWAI MASTER PLAN
T.M.K.s: (2) 4-4-001:015 and
(2) 4-4-002:003, 008, 009, 011, 015, 018 & 038**

1.0 INTRODUCTION

The Department of Hawaiian Home Lands (DHHL) manages the Hawaiian Home Lands trust to develop and deliver land to native Hawaiians.

The DHHL's Honokowai parcels are identified as T.M.K.: (2) 4-4-001:015 and T.M.K.: (2) 4-4-002:003, 008, 009, 011, 015, 018 and 038 encompassing a total area of approximately 800 acres. The project site is primarily undeveloped with the Department of Water Supply's (DWS) Mahinahina Water Treatment Plant and reservoir located at the northeastern end of the property. The DWS 2.0 million-gallon Honokowai tank is also located on the property. The DHHL lands are located immediately to the east of Honoapiilani Highway and approximately one-half mile to the south of the Kapalua West Maui Airport (see Exhibit 2).

The master planning process will assist with the development of a subsistence agricultural homestead community for its beneficiaries. The process includes a thorough analysis of site conditions, cultural resources, assessment of infrastructure capacity, and beneficiary and community outreach.

2.0 EXISTING INFRASTRUCTURE

2.1 ROADWAYS

The major roadway in the vicinity of the DHHL lands is Honoapiilani Highway. It serves as the major arterial between Lahaina and Kapalua. In the vicinity of the project site, the Honoapiilani Highway is a two-way, two-lane north-south roadway.

Three phases of the Honoapiilani Highway Realignment project, also known as the Lahaina Bypass Highway, (Phases 1A, 1B-1 and 1B-2) have been completed. The realignment begins south of the Launiupoko Wayside Park and terminates at Keawe Street where it intersects Honoapiilani Highway near the Lahaina Cannery Mall.

Adjacent roadways include Akahele Street to the north and Lower Honoapiilani Road to the south. The intersections of both roadways at Honoapiilani Highway are signalized. The western terminus of Akahele Street is Lower Honoapiilani Road and the eastern terminus is the Kapalua West Maui Airport. Lower Honoapiilani Road begins at Honoapiilani Highway immediately to the west of the Lahaina Wastewater Reclamation Facility (LWWTF) and its terminus is to the north at the Kapalua Resort. It serves the residential and commercial areas makai of Honoapiilani Highway.

There is an existing cane haul road parallel to and mauka of Honoapiilani Highway which traverses along the western boundary of the DHHL lands. Access to the cane haul road from the north is from Akahele Street and from a roadway on the northern side of the LWWTF. A well-graded dirt road starts from the cane haul road at the western boundary and traverses parallel to the northern boundary line and terminates at the eastern boundary adjacent to the DWS reservoir at the Mahinahina Water Treatment Plant (MWTP). This dirt road is the primary access to the MWTP.

2.2 DRAINAGE

Elevations on the site range from approximately 740 feet above mean sea along the eastern boundary of the site to approximately 40 feet above mean sea level at the western boundary, with an average slope of approximately 6.6%.

Honokowai Stream traverses through the DHHL lands in an east to west direction. An unnamed gulch traverses along the southern boundary of the DHHL properties and intersects Honokowai Stream near the southwestern corner. Approximately 30 percent of the northern section of the DHHL lands

sheet flows toward and onto Honoapiilani Highway and the southern 70 percent of the project site sheet flows into the unnamed Gulch and Honokowai Stream.

In the early 1990's, the County of Maui and the United States Department of Agriculture, Soil Conservation Services, completed the Honokowai Channel project. It consisted of a sedimentation basin, spillway, concrete box culverts and concrete channel near the southwest corner of the DHHL lands. It crosses Honoapiilani Highway at the Honokowai Bridge and continues downstream in a concrete channel. A triple 11'-6" wide x 12'-7" high concrete box culvert was installed under Lower Honoapiilani Road, which connected to an existing concrete channel to the ocean. According to the Design Report, dated February 28, 1992, the concrete channel structure was designed to accommodate 7,972 cfs.

According to Panel Numbers 150003 0351F and 150003 0352E of the Flood Insurance Rate Map, prepared by the United States Federal Emergency Management Agency, with a FIRM Index date of November 4, 2015, the majority of the project site is situated in Flood Zone X, which represents areas outside the 0.2% annual chance floodplain. The lower reaches of Honokowai Stream are in Flood Zones A and AEF (see Exhibits 4A to 4H). Flood Zone A represents a zone where no Base Flood Elevation (BFE) has been determined and Flood Zone AEF represents a floodway in the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

According to the "Soil Survey Database for Island of Maui, Hawaii (September 2014)," prepared by the United States Department of Agriculture Natural Resources Conservation Service, the majority of the soils within the project site are classified as Lahaina silty clay, 3 to 7 percent slopes (LaB), Lahaina silty clay, 7 to 15 percent slopes, Kahana silty clay, 3 to 7 percent slopes (KbB) and Kahana silty clay, 7 to 15 percent slopes (KbC). A small portion of the land along Honokowai Stream, near the southwest corner of the property is classified as Ewa silty clay loam, 0 to 3 percent slope (EaA). A sliver of the

land along the lower southern boundary is classified as Molokai silty clay loam, 3 to 7 percent slopes (MuB) and Molokai silty clay loam, 7 to 15 percent slopes (MuC). Within Honokowai Stream and the unnamed gulch, the soils are classified as rough broken and stony land (rRS) and rock land (rRK).

Ewa silty clay loam, 0 to 3 percent slopes is characterized as having very slow runoff and no more than a slight erosion hazard. Lahaina silty clay, 3 to 7 percent slopes is characterized as having moderate permeability, slow runoff and a slight erosion hazard. Lahaina silty clay, 7 to 15 percent slopes is characterized as having medium runoff and a moderate erosion hazard. Molokai silty clay loam, 3 to 7 percent slopes is characterized as having slow to medium runoff and a slight to moderate erosion hazard. Molokai silty clay loam, 7 to 15 percent slopes is characterized as having medium runoff and a moderate erosion hazard. Kahana silty clay, 3 to 7 percent slopes and 7 to 15 percent slopes is characterized as having moderately rapid permeability, slow to medium runoff and a slight to moderate erosion hazard. Rough broken and stony land consists of very steep, stony gulches. Runoff is rapid and geologic erosion is active. Rock land is made up of areas where exposed rock covers 25 to 90 percent of the surface. The rock outcrops and very shallow soils are the main characteristics.

2.3 SEWER

The LWWTF collects and treats wastewater from Puamana to Kapalua. Its design capacity is 9.0 million gallons per day (mgd) and currently treats about 4.0 mgd of wastewater. Presently, it has the capacity to accommodate the wastewater generated from the development of the DHHL project.

The treated effluent from the LWWTF is of R-1 quality. Of the 4.0 mgd of treated wastewater, approximately 600,000 gallons per day (gpd) during the wet season and 2.0 mgd during the dry season of the R-1 water is transmitted to existing recycled water users. The R-1 water that is not recycled is disposed of through injection wells. Currently, there is approximately 2.0 mgd of R-1 water available.

The County has an existing wastewater transmission line easement along the northern side of Honokowai Stream. Within the easement area, there is a 20-inch transmission force main that can be used to deliver R-1 water to the Honokowai Reservoir and the DLNR Upper Reservoir site. The County is in the design stage of renovating these R-1 facilities to become the core storage and distribution components in its recycled water network.

2.4 WATER

The County of Maui currently operates the MWTF, located near the northeast corner of the DHHL properties at an elevation of approximately 650 feet. It is a surface water treatment plant and the County has an agreement to withdraw up to 5.0 mgd from the Honokohau/Honolua Ditch system. The MWTF has a design capacity of 3.2 mgd and is producing an average of 3.0 mgd.

There is a 16-inch waterline from the MWTF that feeds the 2.0 million-gallon DWS Honokowai Reservoir at an elevation of 250 feet. The uppermost service area from the DWS Honokowai Reservoir is the 150-foot elevation. A 20-inch waterline runs from the Honokowai reservoir to Honoapiilani Highway, where it reduces to a 16-inch waterline at Lower Honoapiilani Road.

An alternative non-potable water source is the R-1 treated wastewater from the LWWRF. Recycled wastewater treated to the R-1 level can be used for golf course irrigation, landscape irrigation and food crops. The LWWRF treatment process is constructed to treat 100 percent of its effluent to R-1 quality standards. In accordance with a 2011 Consent Agreement with the Environmental Protection Agency (EPA), effluent that is discharged into the existing injection wells for disposal must meet R-1 quality. If the County experiences a treatment issue and is unable to produce R-1 quality water, users are contacted, and the water is diverted into the injection wells and reported to the EPA.

The County of Maui Department of Environmental Management (DEM) has an existing pipeline that connects to the County of Maui's Honokowai Reservoir at an elevation of approximately 300 feet above mean sea level. There is also

an existing pipeline from the Honokowai Reservoir to the Upper DLNR Reservoir (Field 140 Reservoir), which is located to the east of the DHHL lands.

The County's reuse system extends from the LWWRF to the DLNR Reservoir at an elevation of approximately 700 feet above mean sea level. The system was modified in 2002 to provide water to the Honokowai Reservoir as part of the 1999 Consent Decree between the EPA, Department of Health and the County of Maui. The R-1 pipeline is a ductile iron pipe and is located within an easement dedicated to the County by the State through Executive Order No. 3206. In the mid 2000's the large pump that conveyed water to the DLNR Reservoir was removed from the manifold as there were no R-1 users for water at this location and water was required in the Kaanapali area. It was determined that the pipeline was in good condition, however the gaskets at the pipe joints were questionable.

2.5 ELECTRIC

There are three existing 69-kV overhead utility distribution systems from the Maalaea Power Plant that service the West Maui area. There are overhead electrical lines on the east side of Honoapiilani Highway that crosses to the west side fronting the DHHL properties.

There are onsite overhead electrical lines that traverse through the project site.

3.0 **ANTICIPATED INFRASTRUCTURE IMPROVEMENTS**

3.1 ROADWAYS

According to the State Department of Transportation (SDOT), monies have been identified for the next phase (Phase 1C) of the Lahaina Bypass Highway. Phase 1C covers the section between Keawe Street and the Kaanapali Connector. However, some in the West Maui community are advocating for the Highway realignment to the south. This will relocate the existing connection to Honoapiilani Highway further south to the Ukumehame area.

The SDOT will make a final decision on the next phase of the Bypass Highway in the next few months.

Phase 1D of the Bypass Highway is the section between Puukolii Road, through DHHL lands and ending at the northern terminus at Honoapiilani Highway. However, this phase may not be constructed for many years. Due to the uncertainty of the timing of this section of the Bypass Highway, Phase 1D will not be considered in this report.

SDOT requires future intersections with Honoapiilani Highway be separated by at least a quarter mile. For master planning purposes, the SDOT concurs with the two access points shown on the master plan. Coordination for highway access should be done with the nearby Pulelehua project. Approval for the final roadway intersections at Honoapiilani Highway will need to be reviewed and approved by the SDOT Right-of-Way Branch. The SDOT will require a traffic impact analysis report to determine the improvements required at each intersection with Honoapiilani Highway to support the proposed project.

The Roadway Classification Table below outlines the County of Maui standards for various roadway classifications.

ROADWAY CLASSIFICATION TABLE

ROADWAY CLASSIFICATION	RIGHT-OF-WAY WIDTH (MIN.)	PAVEMENT WIDTH (MIN.)	PAVEMENT STRUCTURE*
Major Arterial	80 Ft.	56 Ft.	Class "A"
Major Collector	60 Ft.	44 Ft.	Class "A"
Minor Urban Street	48 Ft.	28 Ft.	Class "B"
Minor Rural Street	40 Ft.	22 Ft.	Class "C"

* The pavement structures listed below are the minimum. Modified pavement structures submitted by a licensed Soils Engineer will be considered.

Class "A" 2-1/2" asphalt concrete
 5" asphalt treated base
 8" subbase

Curbed median island
Concrete curb & gutters
Concrete sidewalks on both sides of street

Class "B" 2-1/2" asphalt concrete
 4" asphalt treated base
 6" subbase
 Concrete curb & gutters
 Concrete sidewalks on both sides of street

Class "C" 2" asphalt concrete
 6" base course
 Grassed swales in shoulders

3.2 DRAINAGE

In accordance with Chapter 4, "Rules for the Design of Storm Drainage Facilities in the County of Maui", drainage areas greater than 100 acres and all streams, the Natural Resources Conservation Service (NRCS, formerly Soil Conservation Service) hydrograph method shall be used, with a recurrence interval of 100 years based on a 24-hour storm.

The drainage intent for the project is to limit the need for extensive grading as much as possible and to minimize the alteration of the existing drainage pattern. Development of the project will include the implementation of site-specific best management practices (BMPs) during construction to provide erosion control and minimize impacts to surrounding properties. BMPs may include, but are not limited to:

1. Prevention of cement products, oil, fuel, and other toxic substances from falling or leaching into the water.
2. Prompt and proper disposal of all loosened and excavated soil and debris material from drainage structure work.
3. Retention of ground cover until the latest possible date.
4. Stabilization of graded areas by sodding or planting as soon as possible.
5. Early construction of drainage features.

6. Minimize time of construction.

It is estimated that the existing runoff from a 100-year, 24-hour storm from the project site is 781 cfs, generating a volume of 9,601,148 cubic feet (220.4 acre-feet). Approximately 70 percent of the onsite runoff sheet flows into an unnamed gulch or Honokowai Stream. The unnamed gulch intersects Honokowai Stream within the DHHL property and runoff from both discharge into the Honokowai Basin. The runoff at the Honokowai Basin is stored and eventually overtops an existing spillway into a drainage channel which discharges into the ocean to the west of the DHHL properties.

After development of the proposed project, the runoff from the 100-year, 24-hour storm is estimated to be 1,452 cfs with a volume of 13,476,716 cubic feet (309.4 acre-feet), an increase of 671 cfs and 3,875,568 cubic feet (89 acre-feet). To maintain the existing drainage patterns, it is proposed that the area designated for homestead subsistence ag lots (1 to 2 acres) use grassed roadway and lot swales as the major drainage component. The roadway swales will traverse between lots and discharge into the unnamed gulch or Honokowai Stream, as it is presently doing (see Exhibits 15, 19 and 23).

The parcels designated for multi-family, parks, commercial and industrial development will be required to mitigate the increase in runoff from a 50-year, 1-hour storm within the designated project sites. Runoff in excess of this recurrence interval will be conveyed to the master drainage system provided along the common roadways.

3.3 SEWER

The County of Maui has recently completed a \$45 million upgrade to the LWWTF. The County is now in the process of renovating the Honokowai Reservoir to become a R-1 recycled water storage and distribution reservoir and upgrading its reuse pump station and force main to deliver water to the reservoir in order to expand its reuse network and customer base.

Presently, the LWWTF has capacity available to accommodate the wastewater generated from the DHHL project. Due to the terrain and drainageways on the DHHL lands, an onsite sewer lift station will be required to transport the wastewater generated from the DHHL project to the LWWTF.

DHHL should explore the option of using individual wastewater systems (IWS) for the 1 to 2-acre agricultural lots. Currently, the Department of Health regulations include a 50-lot maximum for the use of IWSs. If public benefit can be shown, a variance may be allowed. Lots with a minimum size of one acre can utilize an IWS, however, only one dwelling is allowed on the lot. The estimated cost for the installation of an IWS is \$15,000.

The DEM has \$13.5 million budgeted for improvements to its R-1 transmission system. Improvements include purchasing Maui Land and Pine's (MLP) 2 million-gallon mid-level reservoir located on TMK: (2) 4-4-002:019, which is located approximately in the middle of the DHHL lands (see Exhibit 8). The DEM anticipates installing a cover over the reservoir to minimize evaporation. The acquisition and improvements to the reservoir is estimated to be completed in the first half of 2020. Thereafter, R-1 water will be available to DHHL recycled water users makai of the 2 million-gallon reservoir.

The DEM plans on building a second pipeline to the 300 feet reservoir as part of its expansion project and it is being designed. The old line to the 300 feet elevation will be rehabilitated after the second line is constructed. The next phase will include the installation of a pump station at the 300 feet reservoir to send water to the 700 feet reservoir. A similar process with force mains will also be incorporated. The DEM would like to coordinate the easement requirements with DHHL to slightly widen the existing easements to accommodate the second pipelines. It would be preferable to build an access and maintenance roadway over the lines for maintenance access, demarcation of the location of the lines and avoiding accidental breakages due to grading or other construction.

The DEM intends to acquire the DLNR Upper Reservoir within 2 years. The reservoir is located on TMK: (2) 4-4-004:012, which is owned by the State and

the reservoir is maintained by the Department of Land and Natural Resources. The reservoir site is immediately mauka (east) of the DHHL properties. The reservoir is not lined and subject to loss of water through seepage.

Once the reservoir is acquired and upgraded, the R-1 water would be mixed with ditch water. Existing and future recycled water users will receive the mixed water through the existing R-1 pipelines and ditch system.

The County will fund and construct the system's regional infrastructure. DHHL will be required to develop the onsite infrastructure to provide service to its beneficiaries. DHHL will be responsible to operate and maintain its onsite wastewater system.

With population growth in West Maui, the increase in wastewater treatment will produce a corresponding increase in the R-1 water supply. In the future, the County may consider upsizing the R-1 transmission line from the LWWTF to the LDNR Upper Reservoir increase its capacity from 2 mgd to 9 mgd.

The DEM is interested in supplying R-1 water to the DHHL lands. Due to the proximity of the properties to the LWWTF and existing R-1 facilities, it would be more cost effective to provide R-1 water to DHHL. According to the DEM, there are other landowners interested in utilizing the County's R-1 water. Distribution of available R-1 water will be on a first come, first serve basis until there is no supply available.

Based on the information provided to DHHL from the Commission on Water Resource Management (CWRM), the estimated irrigation demand in the Honokowai area is 4,900 gallons per acre per day. The three land use alternatives being considered range between 347 and 451 acres for subsistence agriculture. R-1 water can be used for irrigation purposes. The probable R-1 demand for the agricultural lots would be between 1.7 to 2.2 million gallons per day.

The current surplus could meet the higher range of the probable R-1 demand. However, R-1 water has high salinity that may limit the type of crops that could

be supported. An option is to blend the R-1 water with ditch water to reduce the salinity to improve the viability for agricultural purposes.

3.4 WATER

DHHL is working with the DWS to generate an intergovernmental agreement to use the existing Honokowai Well as a potable water source. The proposed project includes source, storage and transmission improvements from the Honokowai Well site to the MWTF site.

CWRM has established a sustainable yield of 6 million gallons a day for the Honokowai aquifer. A 700 gpm pump was installed in the well, which has an installed capacity of 1.0 mgd. Based on an operational schedule of 16 hours pumping over a 24-hour period, the maximum reliable capacity of the well is 448,000 gpd. Pumpage from the well will be within the Honokowai aquifer's sustainable yield.

The DWS is requesting a perpetual land use license for the continued operation and future expansion of the existing MWTP. Through negotiations with the DWS, a 200,000 gpd allocation of potable water will be provided to the DHHL. The DWS will provide a 5/8-inch water meter to each lot. Based on a water consumption of 600 gpd, the allocation could support approximately 330 single family units. The 200,000 gallon allocation is to be used for domestic purposes only. Irrigation demand will be provided by non-potable sources such as R-1 effluent and ditch water.

DHHL proposes improvements to the existing Honokowai Well site and the installation of approximately 8,000 feet of 12-inch transmission waterline to a proposed 100,000-gallon headbreaker tank near the MWTF. The outlet from the headbreaker tank will connect to the existing 16-inch transmission line near the existing 2-million-gallon finish water tank at the MWTF. The existing pump in the Honokowai Well will be replaced with a 700 gpm submersible pump. A new control building is being proposed at the well site, which will be graded to accommodate a potential 500,000-gallon storage tank. DHHL proposes the

source, storage and transmission improvements to support its operation as a potable water source to potentially service the Honokowai lands for future planned agricultural, residential and commercial purposes.

A Water Policy Plan was adopted by the Hawaiian Homes Commission on July 22, 2014. One of the relevant policies is to expressly determine and plan for future water needs and actively participate in broader water management, use and protection efforts in Hawaii in order to secure water.

A State Water Projects Plan was adopted by CWRM in May 2017. It identifies DHHL water needs and calculates potable and non-potable water demands based on DHHL plans. The projected long-term potable water demand (2026 and beyond) for the Honokowai lands is 617,900 gpd. It is proposed that potable water for DHHL be provided by the DWS system.

See Section 3.3 SEWER for possible use of R-1 water as a non-potable water source for the project. See Appendix B for the Potable Water Demand.

3.5 ELECTRIC

DHHL will need to work with Maui Electric Company to utilize their existing facilities to service the project.

The DEM may be interested in exploring photovoltaic alternatives to offset the pumping cost for the R-1 water to the upper reservoirs. The DHHL could investigate the option of working with the County of Maui and the DEM on this alternative.

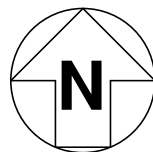
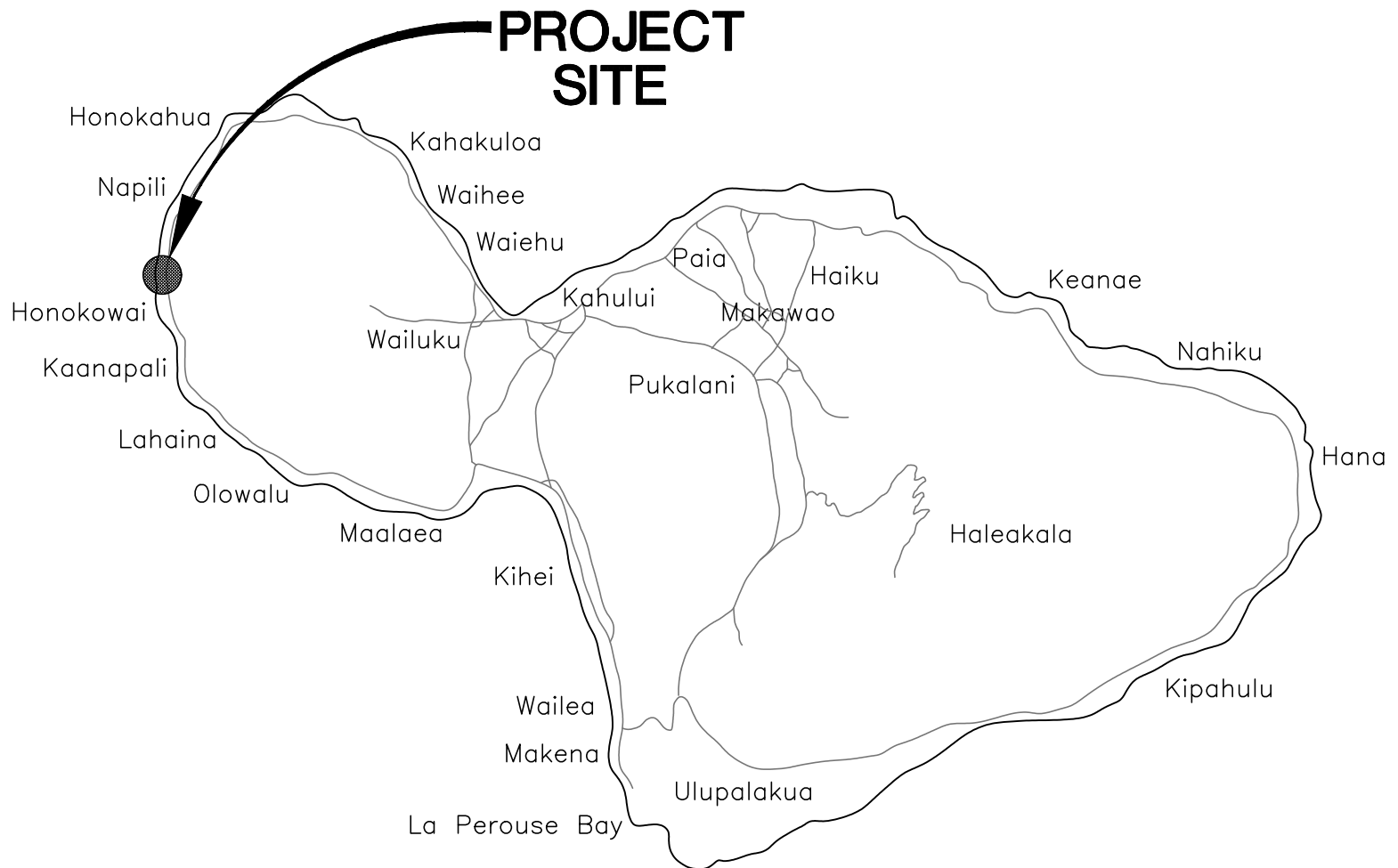
4.0 PREFERRED ALTERNATIVE

DHHL selected Alternative C as their preferred alternative and is proposing to develop the project in two phases. The first phase will consist of 56 subsistence agricultural lots and a community use park. The second phase will consist of 38 subsistence agricultural lots, 356 homestead single-family residential lots, one community use agriculture lot, and 3 community use parks.

EXHIBITS

- 1 LOCATION MAP**
- 2 VICINITY MAP**
- 3 SOIL SURVEY MAP**
- 4-A FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-001:015)**
- 4-B FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:003)**
- 4-C FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:008)**
- 4-D FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:009)**
- 4-E FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:011)**
- 4-F FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:015)**
- 4-G FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:018)**
- 4-H FLOOD INSURANCE RATE MAP (TMK: (2) 4-4-002:038)**
- 5 EXISTING LAND SLOPE**
- 6 RAINFALL ISOHYET MAP**
- 7 SOIL CLASSIFICATION MAP**
- 8 ONSITE EXISTING UTILITIES**
- 9 EXISTING OFFSITE SEWER INFRASTRUCTURE**
- 10 EXISTING OFFSITE WATER INFRASTRUCTURE**
- 11 EXISTING OFFSITE DRAINAGE INFRASTRUCTURE**
- 12 ALTERNATE A – PROPOSED SEWER SYSTEM & R-1 WATER MAP (IWS FOR 1 TO 2 ACRE AG LOTS)**
- 13 ALTERNATE A – PROPOSED SEWER SYSTEM & R-1 WATER MAP (NO IWS)**
- 14 ALTERNATE A – PROPOSED WATER SYSTEM MAP**
- 15 ALTERNATE A – PROPOSED DRAINAGE SYSTEM MAP**
- 16 ALTERNATE B – PROPOSED SEWER SYSTEM & R-1 WATER MAP (IWS FOR 1 TO 2 ACRE AG LOTS)**
- 17 ALTERNATE B – PROPOSED SEWER SYSTEM & R-1 WATER MAP (NO IWS)**
- 18 ALTERNATE B – PROPOSED WATER SYSTEM MAP**
- 19 ALTERNATE B – PROPOSED DRAINAGE SYSTEM MAP**
- 20 ALTERNATE C – PROPOSED SEWER SYSTEM & R-1 WATER MAP (IWS FOR 1 TO 2 ACRE AG LOTS)**
- 21 ALTERNATE C – PROPOSED SEWER SYSTEM & R-1 WATER MAP (NO IWS)**
- 22 ALTERNATE C – PROPOSED WATER SYSTEM MAP**
- 23 ALTERNATE C – PROPOSED DRAINAGE SYSTEM MAP**
- 24 ALTERNATE C (PHASE I) – PROPOSED SEWER SYSTEM & R-1 WATER MAP (IWS FOR 1 TO 2 ACRE AG LOTS)**

- 25 **ALTERNATE C (PHASE I) – PROPOSED SEWER SYSTEM & R-1
WATER MAP (NO IWS)**
- 26 **ALTERNATE C (PHASE I) – PROPOSED WATER SYSTEM MAP**
- 27 **ALTERNATE C (PHASE I) – PROPOSED DRAINAGE SYSTEM
MAP**
- 28 **ALTERNATE C (PHASE II) – PROPOSED SEWER SYSTEM & R-1
WATER MAP (IWS FOR 1 TO 2 ACRE AG LOTS)**
- 29 **ALTERNATE C PHASE II) – PROPOSED SEWER SYSTEM & R-1
WATER MAP (NO IWS)**
- 30 **ALTERNATE C (PHASE II) – PROPOSED WATER SYSTEM MAP**
- 31 **ALTERNATE C (PHASE II) – PROPOSED DRAINAGE SYSTEM
MAP**

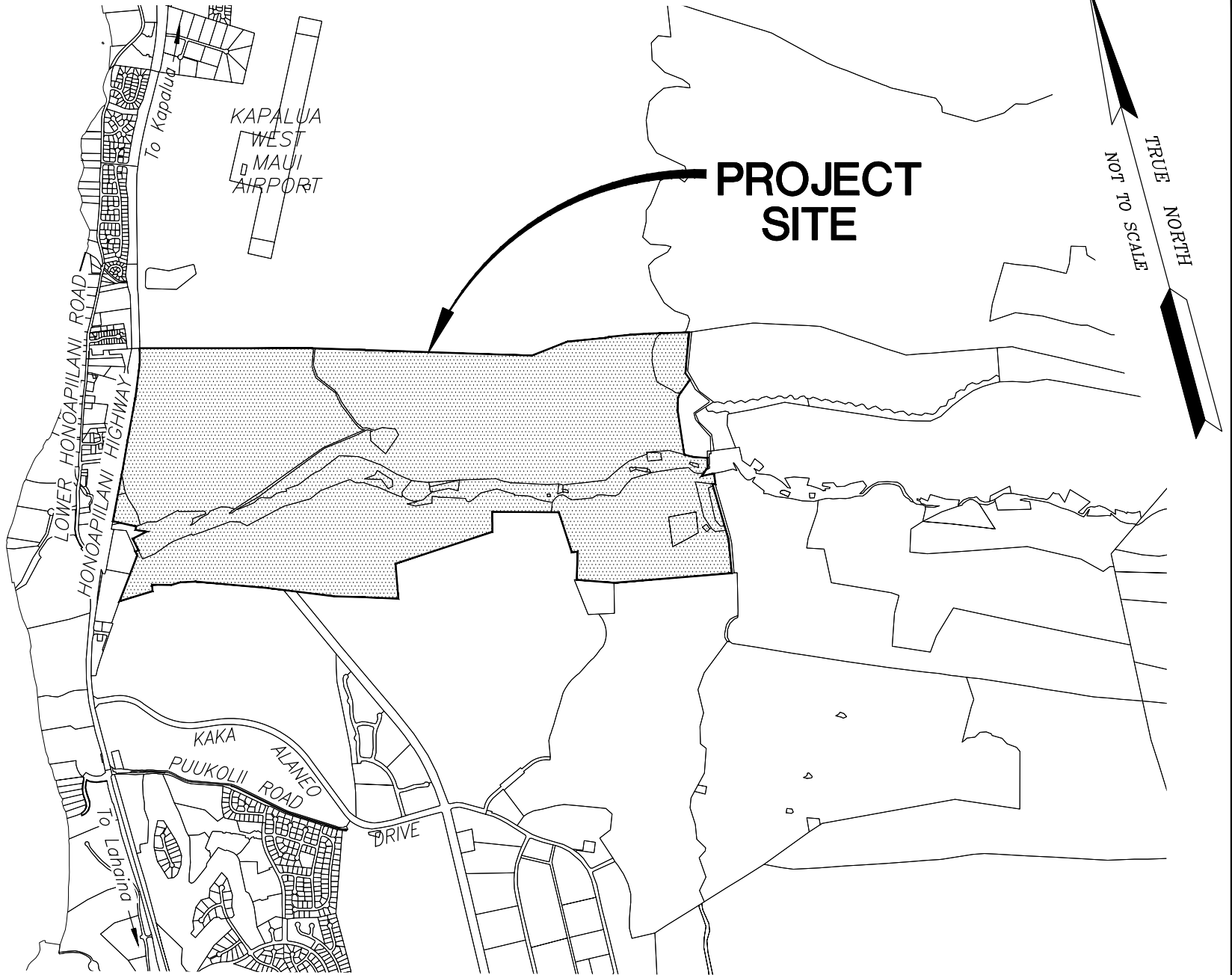


ISLAND OF MAUI

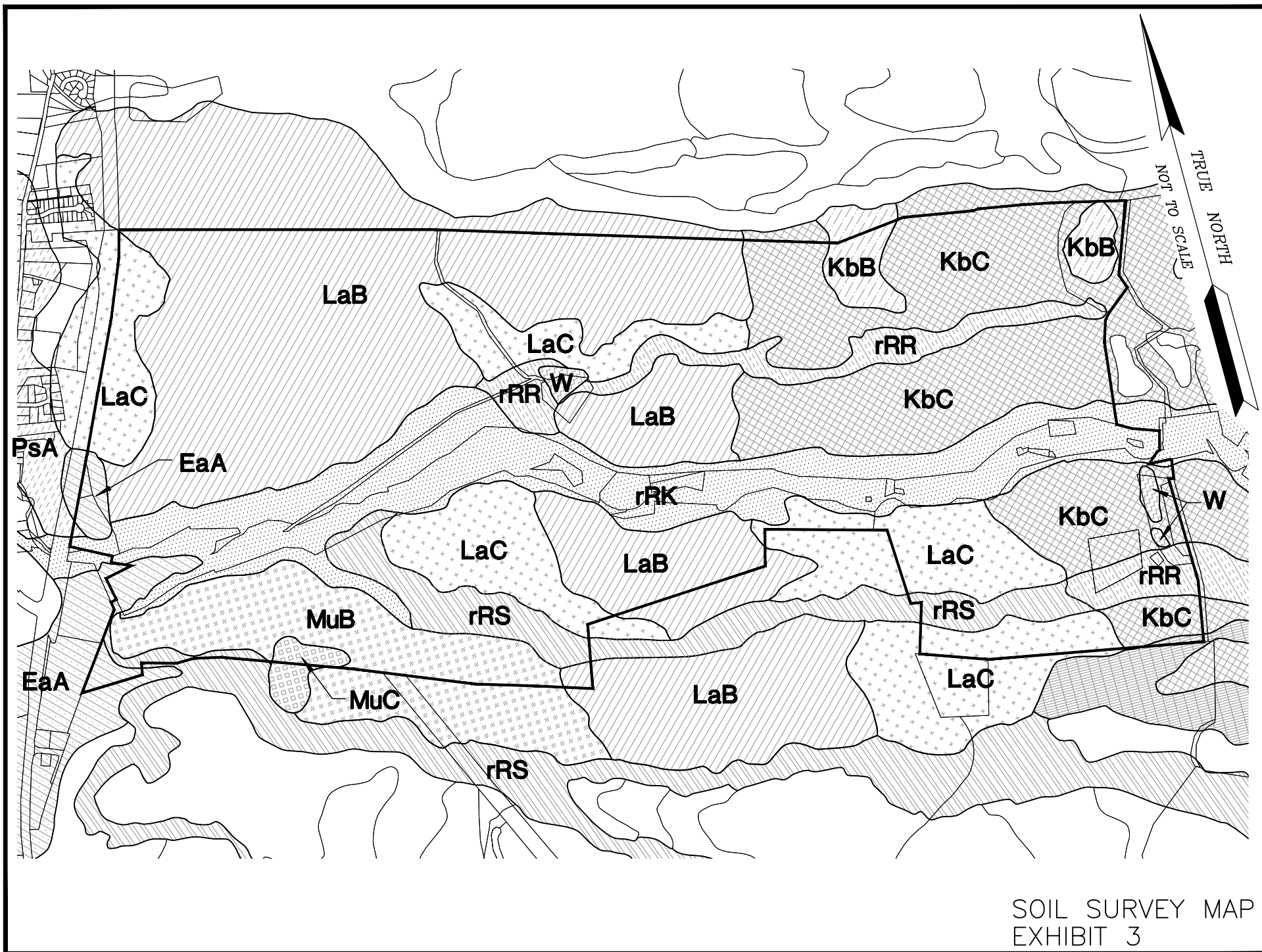
NOT TO SCALE

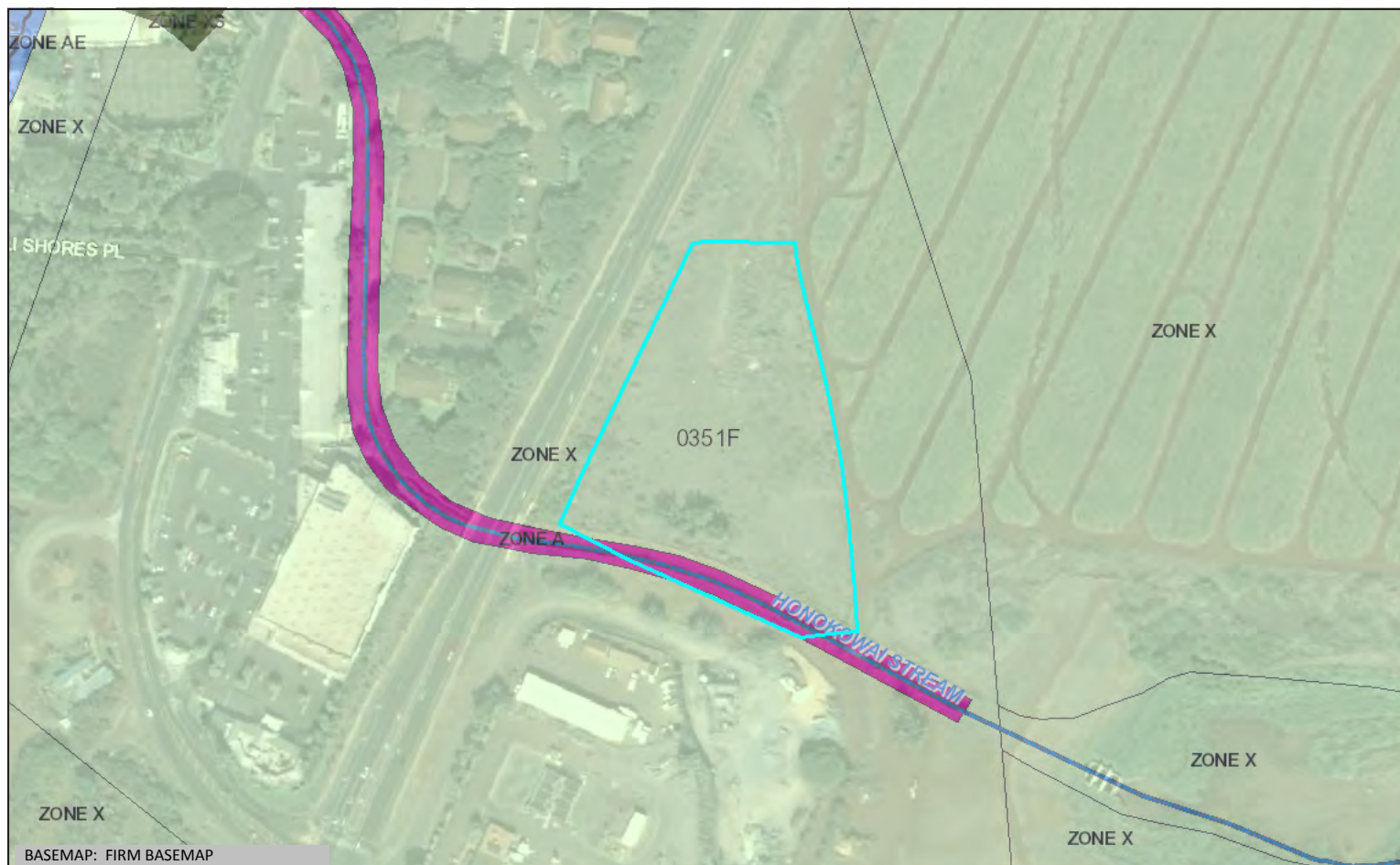
LOCATION MAP
EXHIBIT 1

O
C
E
A
N



VICINITY MAP
EXHIBIT 2





Flood Hazard Assessment Report

www.hawaiiinfip.org

4-4-001:015

Property Information

COUNTY: MAUI
 TMK NO: (2) 4-4-001:015
 WATERSHED: HONOKOWAI
 PARCEL ADDRESS: HONOAPIILANI HWY
 LAHAINA, HI 96761

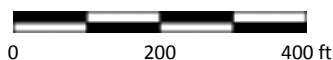
Notes:

Flood Hazard Information

FIRM INDEX DATE: NOVEMBER 04, 2015
 LETTER OF MAP CHANGE(S): NONE
 FEMA FIRM PANEL: 1500030351F
 PANEL EFFECTIVE DATE: SEPTEMBER 19, 2012

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://www.scd.hawaii.gov/>

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: YES (MA-0130)
 FOR MORE INFO, VISIT: <http://dlnreng.hawaii.gov/dam/>



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If this map has been identified as 'PRELIMINARY', please note that it is being provided for informational purposes and is not to be used for flood insurance rating. Contact your county floodplain manager for flood zone determinations to be used for compliance with local floodplain management regulations.

FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND (Note: legend does not correspond with NFHL)

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

	Zone A: No BFE determined.
	Zone AE: BFE determined.
	Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
	Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
	Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
	Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.
	Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

	Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
	Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

	Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase applies, but coverage is available in participating communities.
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BASEMAP: FIRM BASEMAP



Flood Hazard Assessment Report

www.hawaiiinfip.org

4-4-002:003

Property Information

COUNTY: MAUI
 TMK NO: (2) 4-4-002:003
 WATERSHED: HONOKOWAI; WAHIKULI
 PARCEL ADDRESS: HONOKOWAI
 LAHAINA, HI 96761

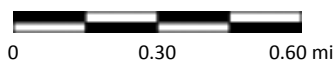
Notes:

Flood Hazard Information

FIRM INDEX DATE: NOVEMBER 04, 2015
 LETTER OF MAP CHANGE(S): NONE
 FEMA FIRM PANEL - EFFECTIVE DATE: 1500030351F - SEPTEMBER 19, 2012
 1500030352E - SEPTEMBER 25, 2009

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://www.scd.hawaii.gov/>

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: YES (MA-0054; MA-0056; MA-0058; MA-0059; MA-0130)
 FOR MORE INFO, VISIT: <http://dlnreng.hawaii.gov/dam/>



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FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND (Note: legend does not correspond with NFHL)

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

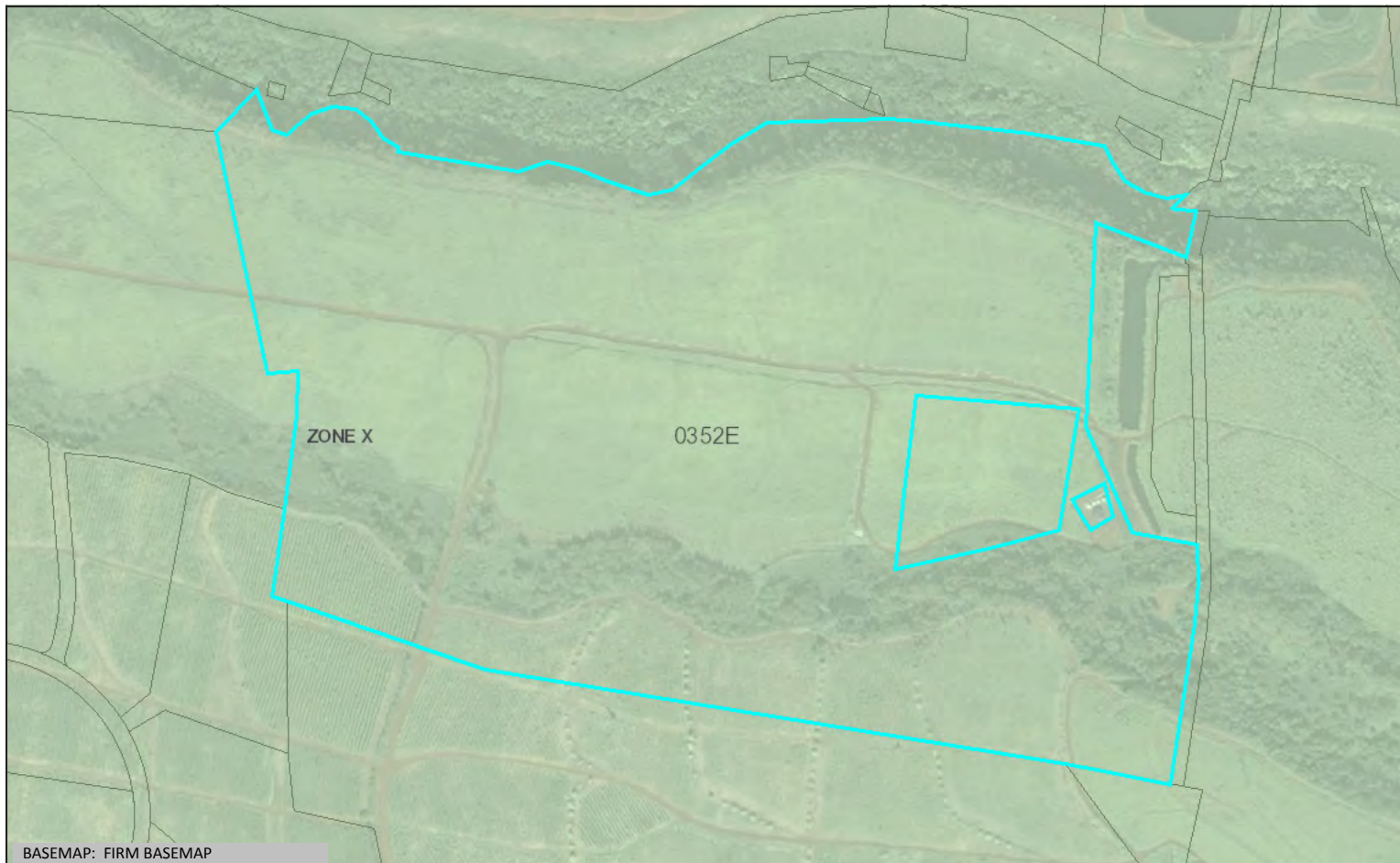
	Zone A: No BFE determined.
	Zone AE: BFE determined.
	Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
	Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
	Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
	Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.
	Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

	Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
	Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

	Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase applies, but coverage is available in participating communities.
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BASEMAP: FIRM BASEMAP



Flood Hazard Assessment Report

www.hawaiiinfip.org

DHHL Honokowai

Property Information

COUNTY: MAUI
 TMK NO: (2) 4-4-002:008
 WATERSHED: HONOKOWAI; WAHIKULI
 PARCEL ADDRESS:

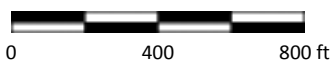
Notes:

Flood Hazard Information

FIRM INDEX DATE: NOVEMBER 04, 2015
 LETTER OF MAP CHANGE(S): NONE
 FEMA FIRM PANEL: 1500030352E
 PANEL EFFECTIVE DATE: SEPTEMBER 25, 2009

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://www.scd.hawaii.gov/>

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: YES (MA-0059)
 FOR MORE INFO, VISIT: <http://dlnreng.hawaii.gov/dam/>



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FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND

(Note: legend does not correspond with NFHL)

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

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	Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
	Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
	Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.
	Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

	Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
	Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

	Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase applies, but coverage is available in participating communities.
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ZONE X

0352E

BASEMAP: FIRM BASEMAP



Flood Hazard Assessment Report

www.hawaiiinfip.org

DHHL Honokowai

Property Information

COUNTY: MAUI
 TMK NO: (2) 4-4-002:009
 WATERSHED: HONOKOWAI
 PARCEL ADDRESS:

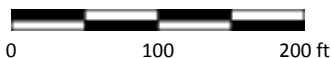
Notes:

Flood Hazard Information

FIRM INDEX DATE: NOVEMBER 04, 2015
 LETTER OF MAP CHANGE(S): NONE
 FEMA FIRM PANEL: 1500030352E
 PANEL EFFECTIVE DATE: SEPTEMBER 25, 2009

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://www.scd.hawaii.gov/>

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://dlnreng.hawaii.gov/dam/>



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FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND (Note: legend does not correspond with NFHL)

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

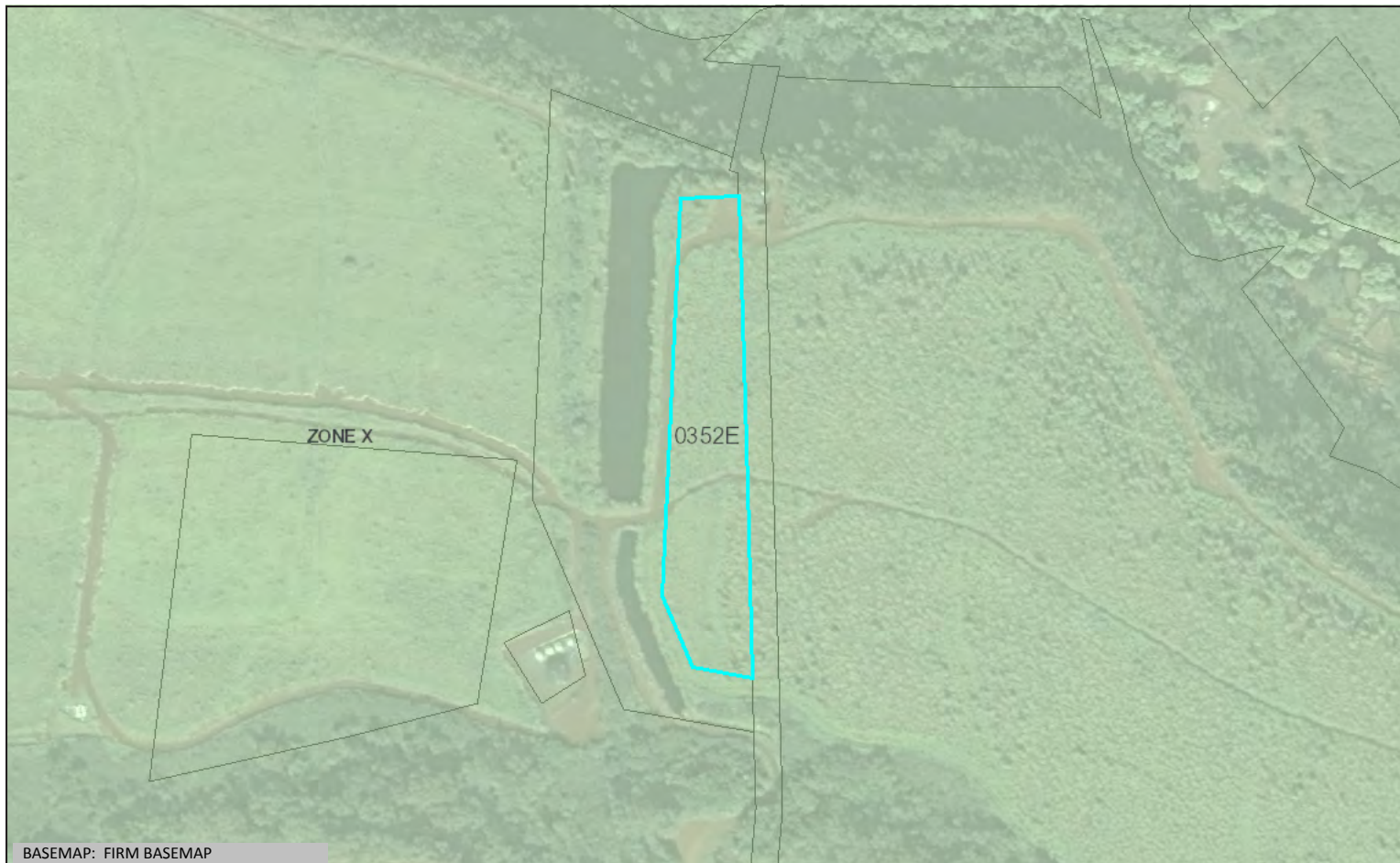
	Zone A: No BFE determined.
	Zone AE: BFE determined.
	Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
	Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
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	Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.
	Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

	Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
	Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

	Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase applies, but coverage is available in participating communities.
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Flood Hazard Assessment Report

www.hawaiiinfip.org

DHHL Honokowai

Property Information

COUNTY: MAUI
 TMK NO: (2) 4-4-002:011
 WATERSHED: HONOKOWAI
 PARCEL ADDRESS:

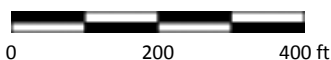
Notes:

Flood Hazard Information

FIRM INDEX DATE: NOVEMBER 04, 2015
 LETTER OF MAP CHANGE(S): NONE
 FEMA FIRM PANEL: 1500030352E
 PANEL EFFECTIVE DATE: SEPTEMBER 25, 2009

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://www.scd.hawaii.gov/>

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://dlnreng.hawaii.gov/dam/>



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FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND (Note: legend does not correspond with NFHL)

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	Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
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	Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.
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	Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
	Zone X: Areas determined to be outside the 0.2% annual chance floodplain.
OTHER FLOOD AREAS	
	Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase applies, but coverage is available in participating communities.



BASEMAP: FIRM BASEMAP



Flood Hazard Assessment Report

www.hawaiiinfip.org

DHHL Honokowai

Property Information

COUNTY: MAUI
 TMK NO: (2) 4-4-002:015
 WATERSHED: HONOKOWAI
 PARCEL ADDRESS:

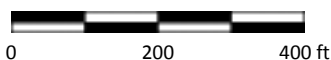
Notes:

Flood Hazard Information

FIRM INDEX DATE: NOVEMBER 04, 2015
 LETTER OF MAP CHANGE(S): NONE
 FEMA FIRM PANEL: 1500030352E
 PANEL EFFECTIVE DATE: SEPTEMBER 25, 2009

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://www.scd.hawaii.gov/>

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: YES (MA-0144)
 FOR MORE INFO, VISIT: <http://dlnreng.hawaii.gov/dam/>



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FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND (Note: legend does not correspond with NFHL)

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

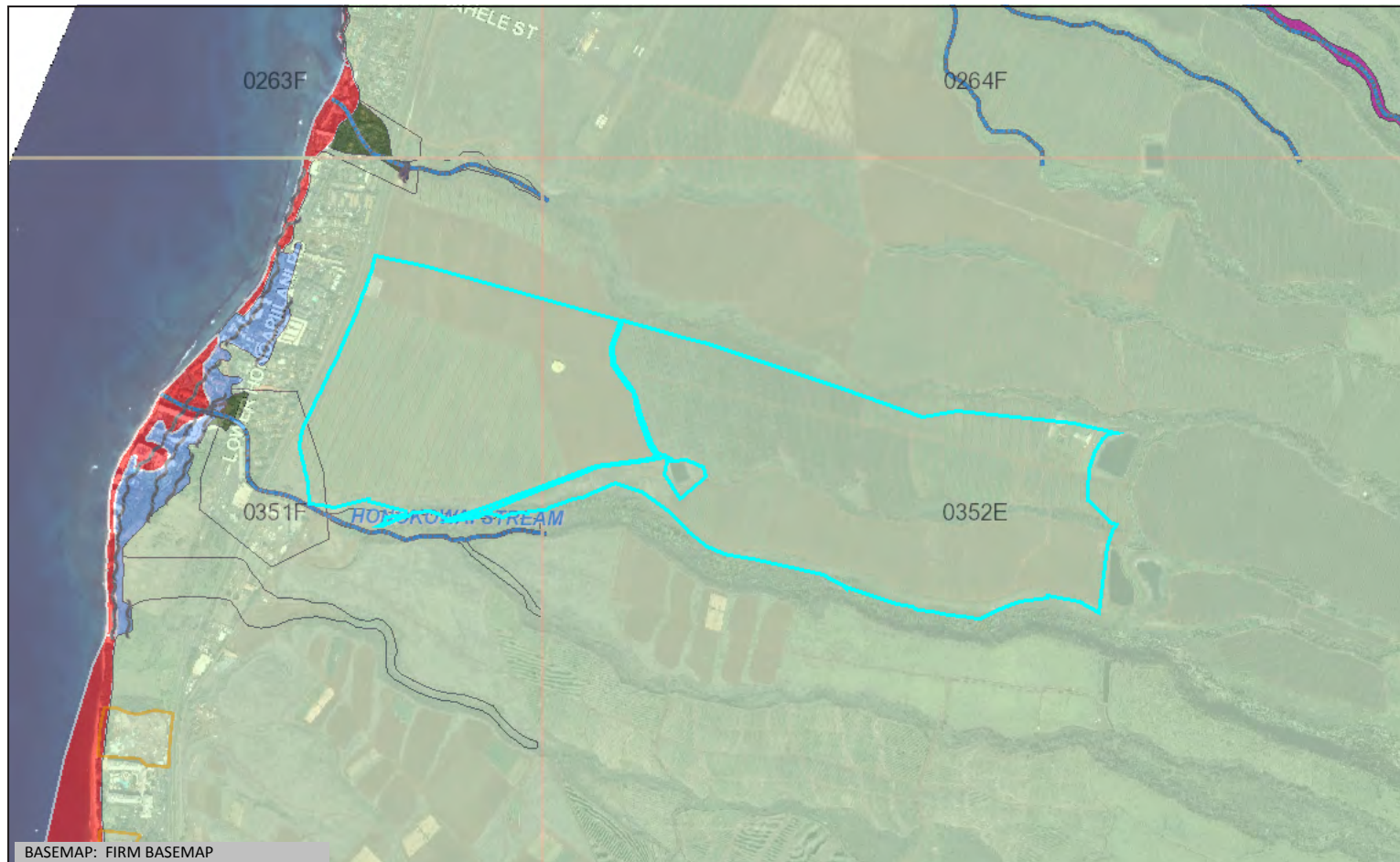
	Zone A: No BFE determined.
	Zone AE: BFE determined.
	Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
	Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
	Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
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	Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
	Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

	Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase applies, but coverage is available in participating communities.
--	---



Flood Hazard Assessment Report

www.hawaiiinfip.org

4-4-002:018

Property Information

COUNTY: MAUI
 TMK NO: (2) 4-4-002:018
 WATERSHED: HONOKOWAI
 PARCEL ADDRESS:

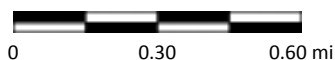
Notes:

Flood Hazard Information

FIRM INDEX DATE: NOVEMBER 04, 2015
 LETTER OF MAP CHANGE(S): NONE
 FEMA FIRM PANEL - EFFECTIVE DATE: 1500030351F - SEPTEMBER 19, 2012
 1500030352E - SEPTEMBER 25, 2009

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://www.scd.hawaii.gov/>

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: YES (MA-0058; MA-0059; MA-0130; MA-0142; MA-0143; MA-0144)
 FOR MORE INFO, VISIT: <http://dlnr.hawaii.gov/dam/>



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FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND (Note: legend does not correspond with NFHL)

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

	Zone A: No BFE determined.
	Zone AE: BFE determined.
	Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
	Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
	Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
	Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.
	Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

	Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
	Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

	Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase applies, but coverage is available in participating communities.
--	---



Flood Hazard Assessment Report

www.hawaiiinfip.org

DHHL HONOKOWAI

Property Information

COUNTY: MAUI
 TMK NO: (2) 4-4-002:038
 WATERSHED: HONOKOWAI
 PARCEL ADDRESS: ADDRESS NOT DETERMINED
 LAHAINA, HI 96761

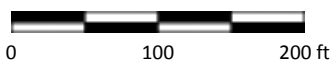
Notes:

Flood Hazard Information

FIRM INDEX DATE: NOVEMBER 04, 2015
 LETTER OF MAP CHANGE(S): NONE
 FEMA FIRM PANEL: 1500030351F
 PANEL EFFECTIVE DATE: SEPTEMBER 19, 2012

THIS PROPERTY IS WITHIN A TSUNAMI EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://www.scd.hawaii.gov/>

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
 FOR MORE INFO, VISIT: <http://dlnreng.hawaii.gov/dam/>



Disclaimer: The Hawaii Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use, accuracy, completeness, and timeliness of any information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR, its officers, and employees from any liability which may arise from its use of its data or information.

If this map has been identified as 'PRELIMINARY', please note that it is being provided for informational purposes and is not to be used for flood insurance rating. Contact your county floodplain manager for flood zone determinations to be used for compliance with local floodplain management regulations.

FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND

(Note: legend does not correspond with NFHL)

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

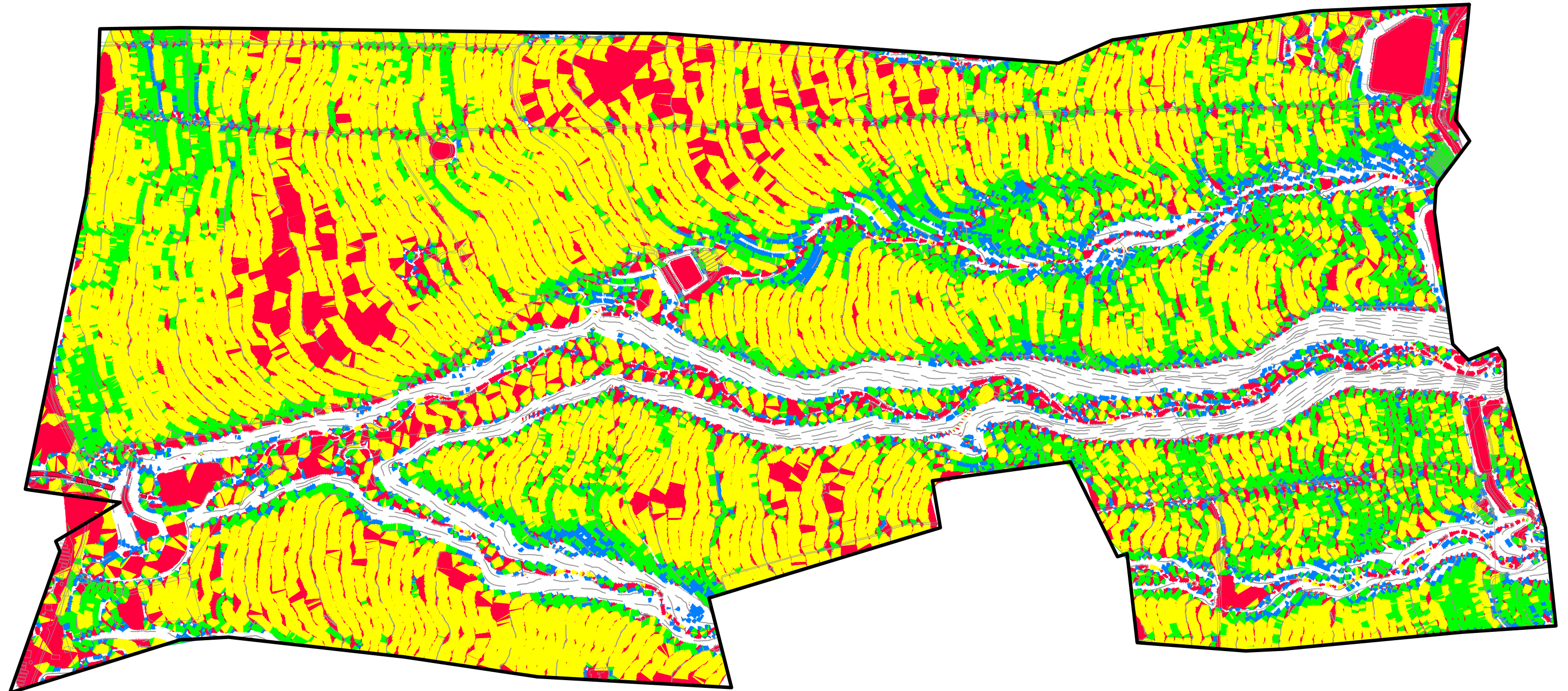
	Zone A: No BFE determined.
	Zone AE: BFE determined.
	Zone AH: Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
	Zone AO: Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
	Zone V: Coastal flood zone with velocity hazard (wave action); no BFE determined.
	Zone VE: Coastal flood zone with velocity hazard (wave action); BFE determined.
	Zone AEF: Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

	Zone XS (X shaded): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
	Zone X: Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

	Zone D: Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase applies, but coverage is available in participating communities.
--	---



MAP LEGEND:

	<5% SLOPE
	5% TO 10% SLOPE
	10% TO 15% SLOPE
	>20% SLOPE

**EXHIBIT 5
EXISTING LAND SLOPE**

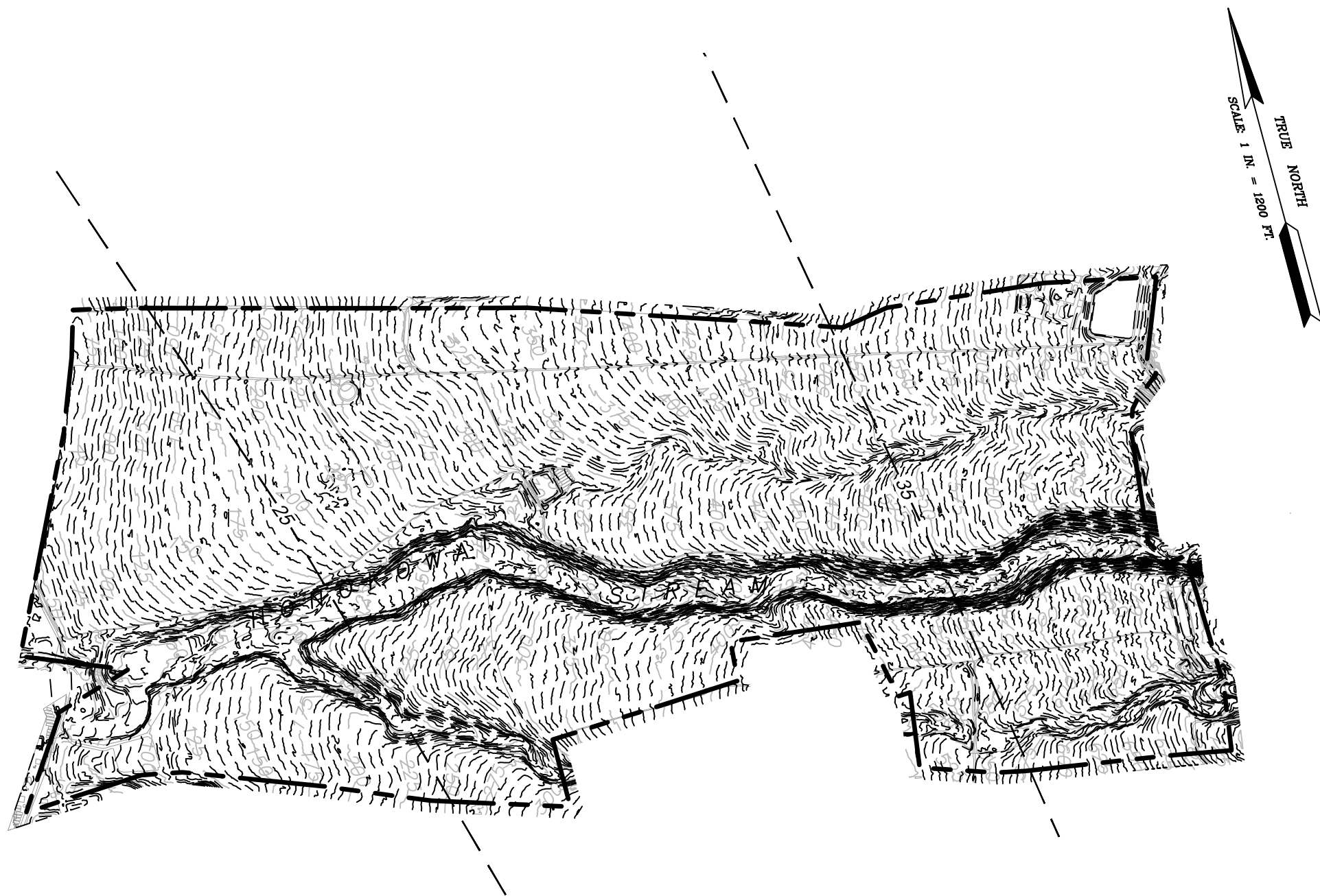


EXHIBIT 6
RAINFALL ISOHYET MAP

G:\2018 PROJECTS\2018-41\MAPS\SOILS MAP.dwg Aug. 14, 2020 - 2:16pm

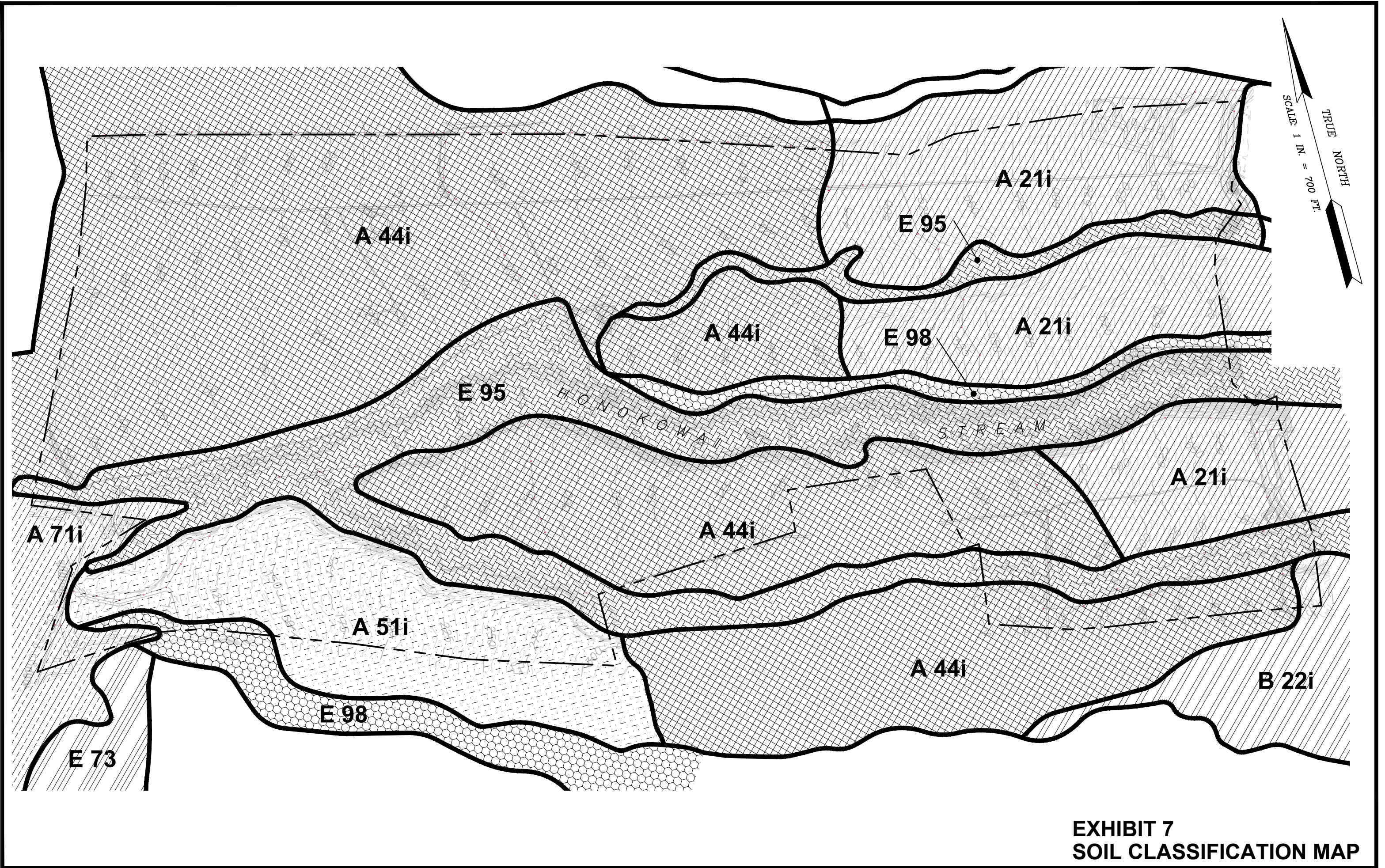
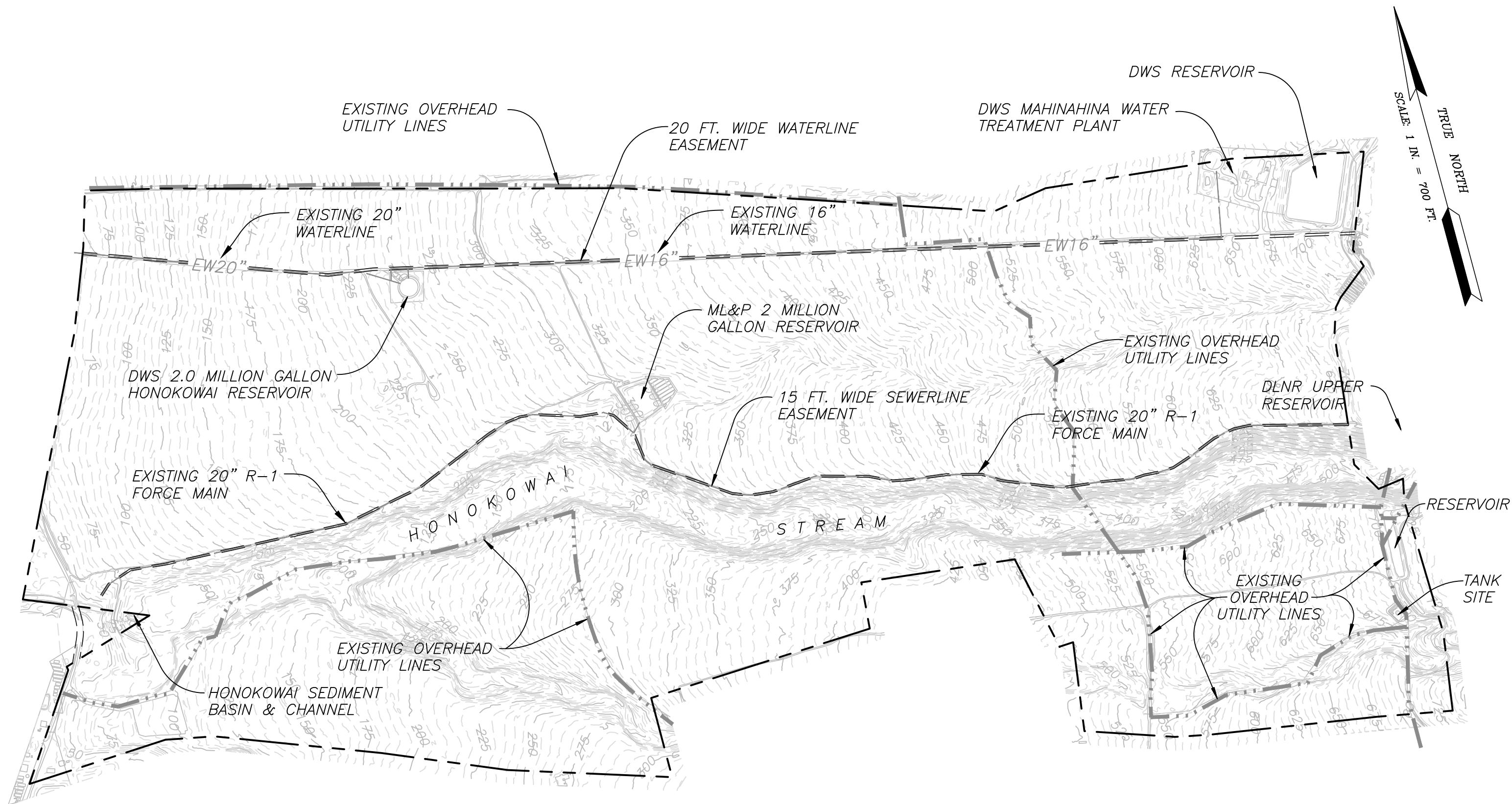
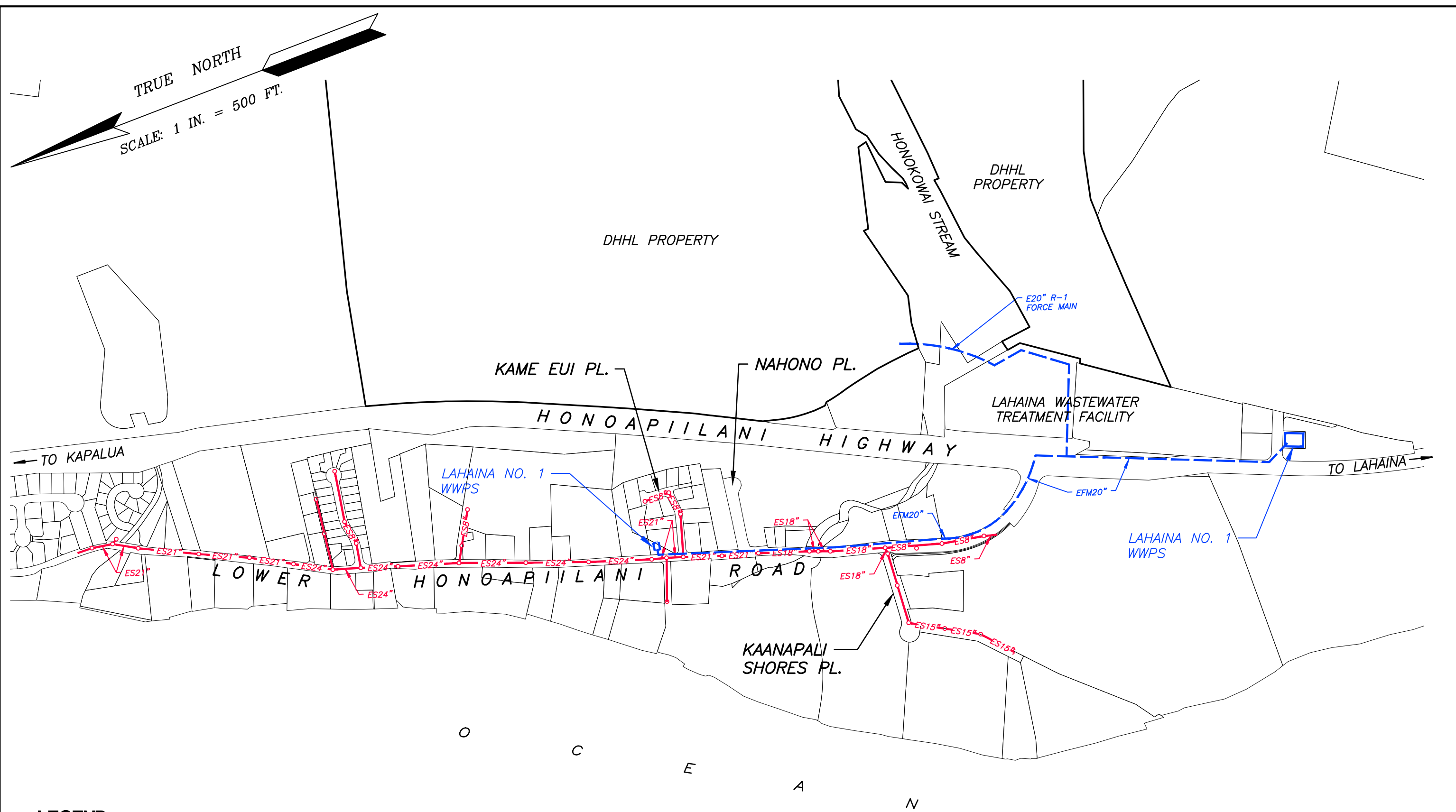


EXHIBIT 7
SOIL CLASSIFICATION MAP



**EXHIBIT 8
EXISTING ONSITE UTILITIES**

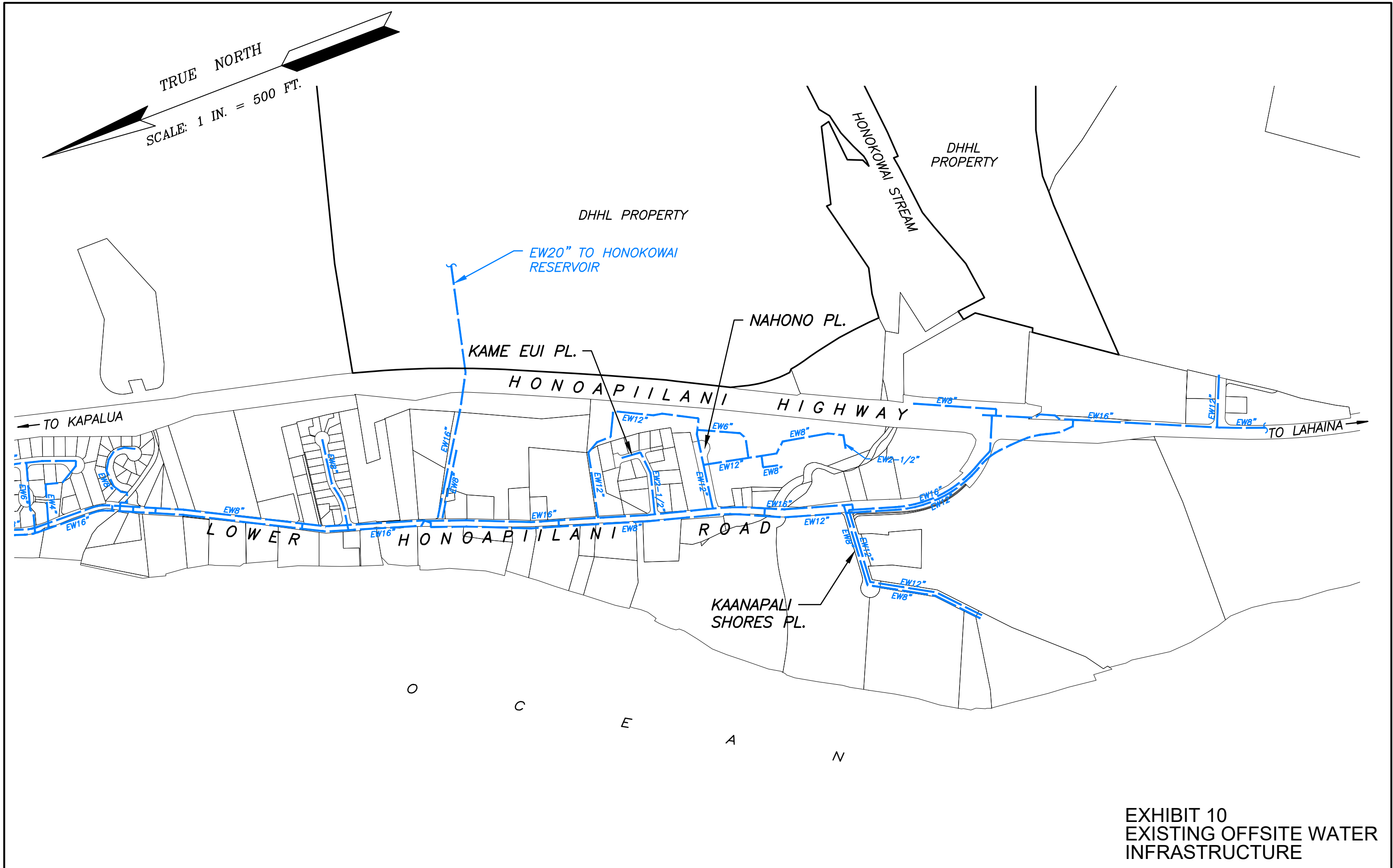
TRUE NORTH
SCALE: 1 IN. = 500 FT.



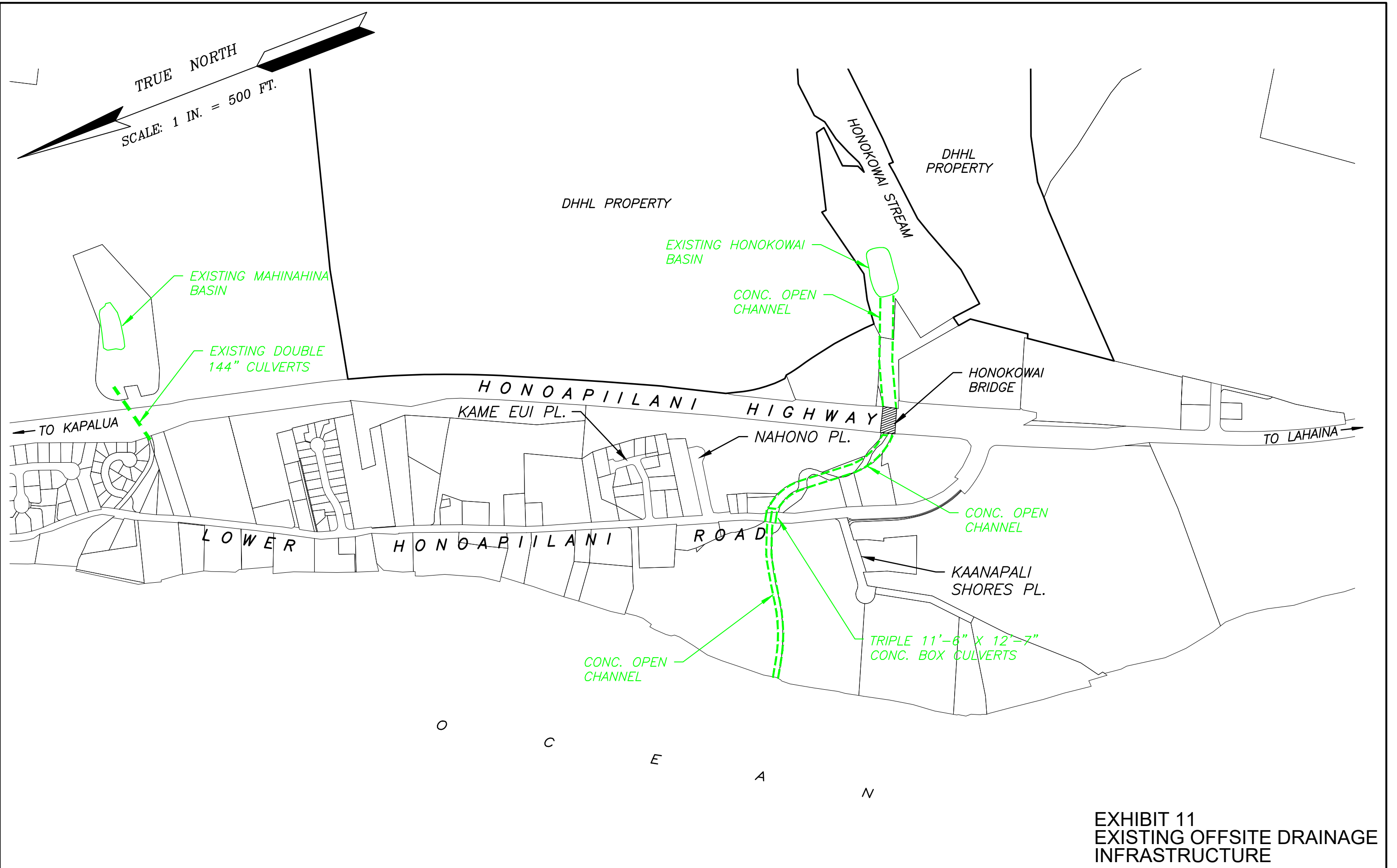
- LEGEND:**
- EXISTING SEWERLINE WITH SIZE
 - EXISTING FORCE MAIN WITH SIZE
 - SEWER MANHOLE

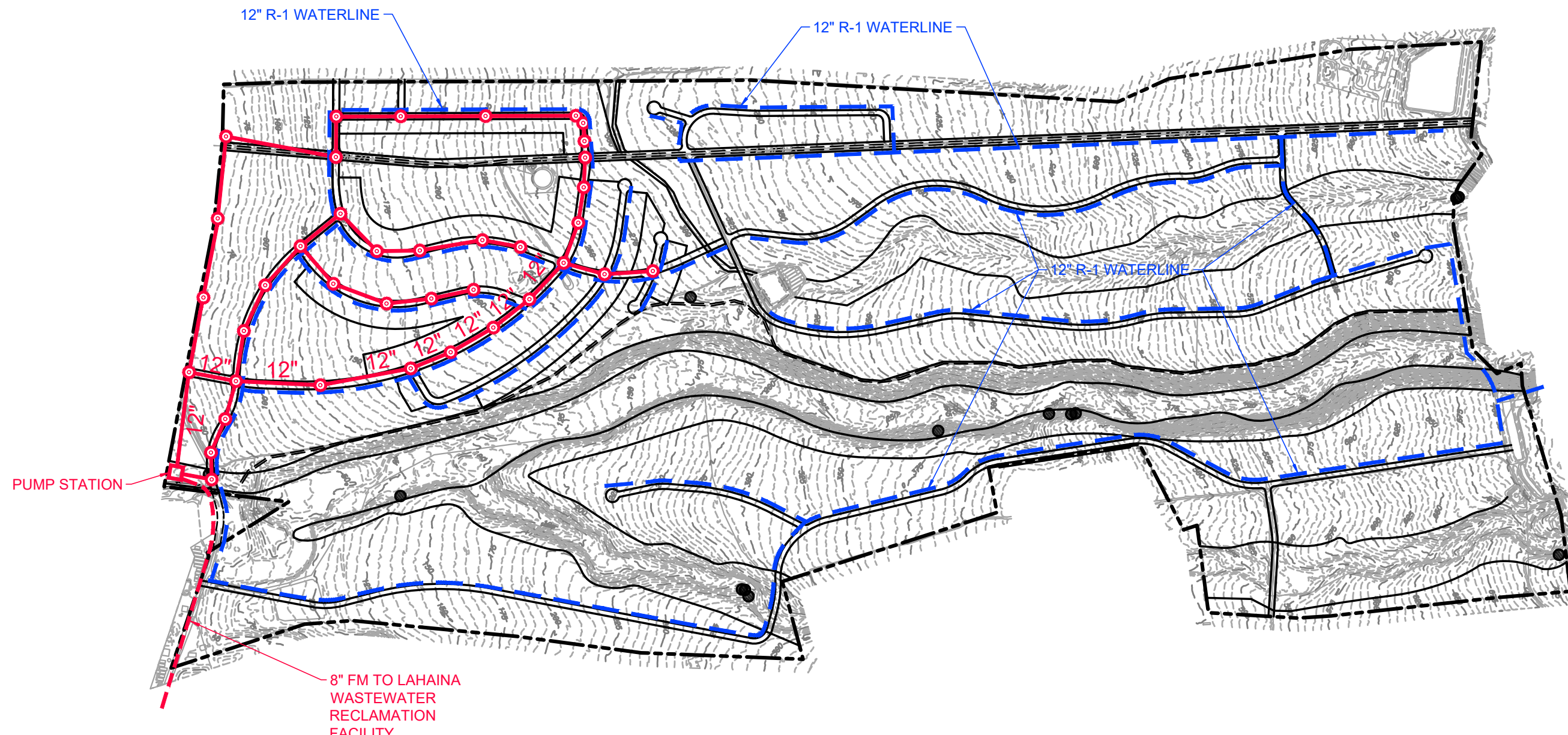
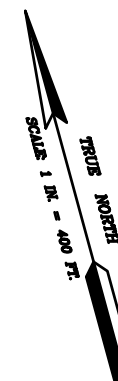
EXHIBIT 9
EXISTING OFFSITE SEWER
INFRASTRUCTURE

G:\2018 PROJECTS\2018-41\EXHIBITS\EXTG INFRASTRUCTURE.dwg Aug. 14, 2020 - 2:00pm



G:\2018 PROJECTS\2018-41\EXHIBITS\EXTG INFRASTRUCTURE.dwg Aug. 14, 2020 - 1:59pm

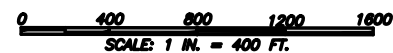




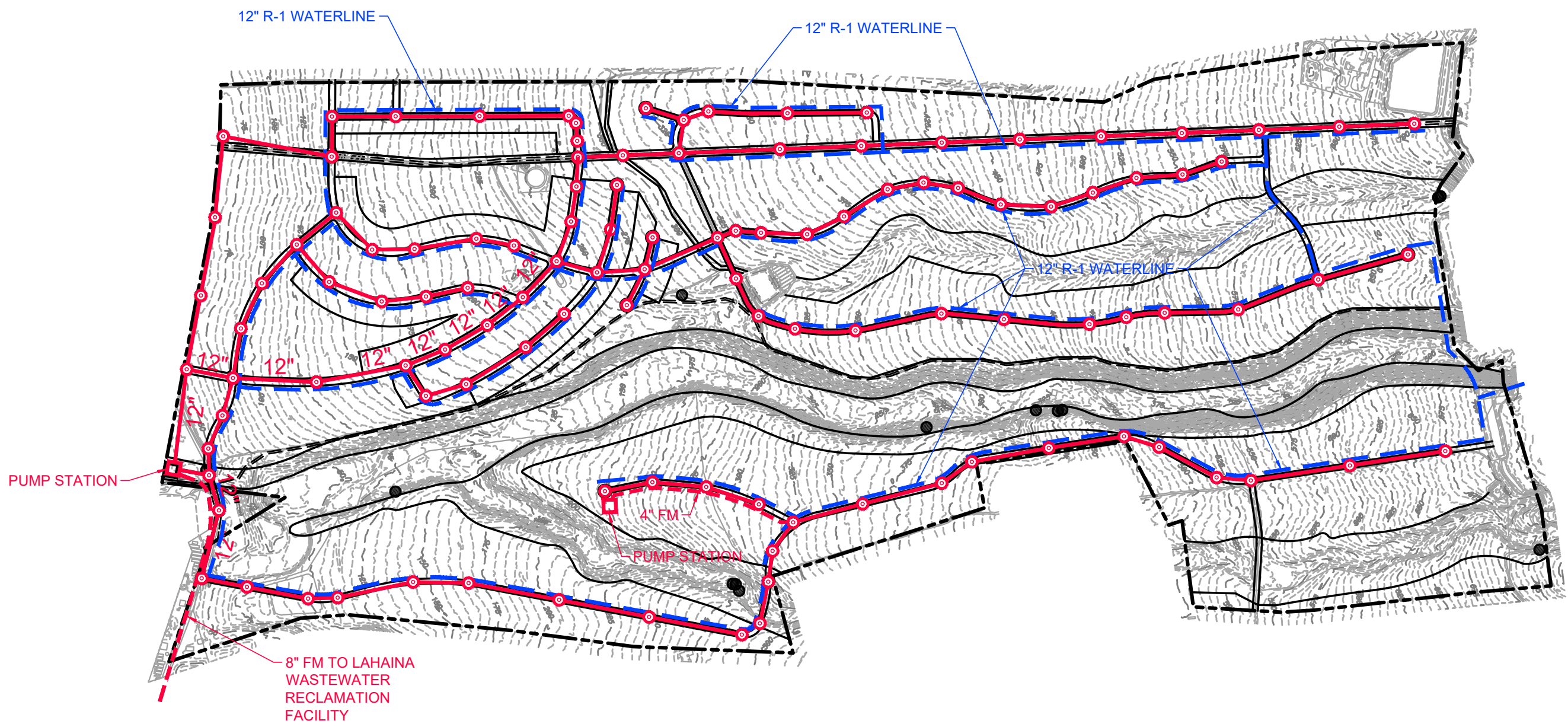
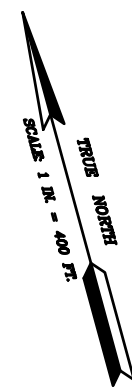
NOTE - ALL SEWERLINES ARE
8" PVC UNLESS OTHERWISE
NOTED.

LEGEND:

- SEWER MANHOLE
- SEWERLINE W/SIZE
- SEWER PUMP STATION
- FORCEMAIN W/SIZE
- 12" R-1 WATERLINE



**EXHIBIT 12
ALTERNATE A
PROPOSED SEWER SYSTEM
& R-1 WATER (IWS FOR 1 - 2
ACRE LOTS) MAP**



NOTE - ALL SEWERLINES ARE
8" PVC UNLESS OTHERWISE
NOTED.

- LEGEND:
-  SEWER MANHOLE
 -  SEWERLINE W/SIZE
 -  SEWER PUMP STATION
 -  FORCEMAIN W/SIZE
 -  12" R-1 WATERLINE

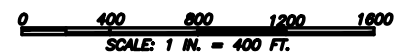
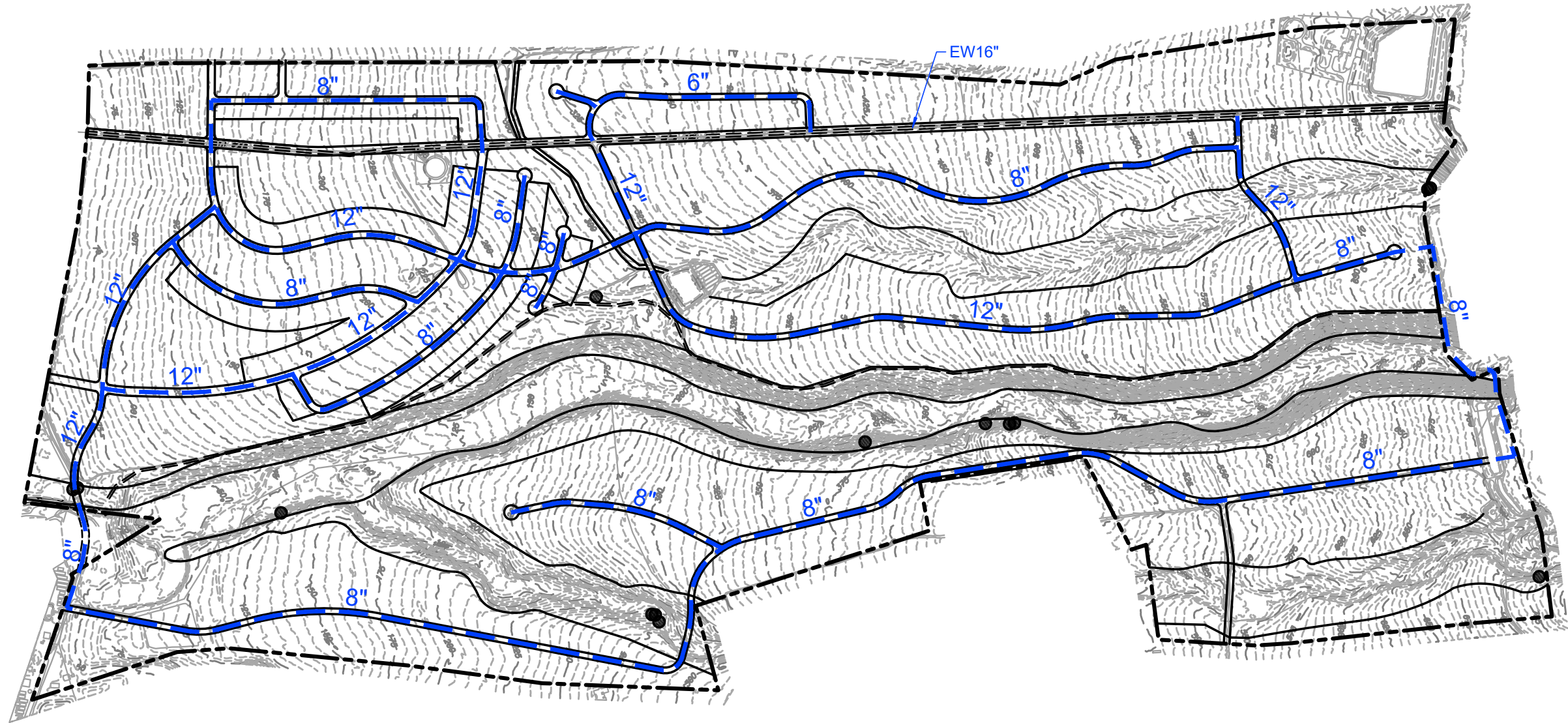


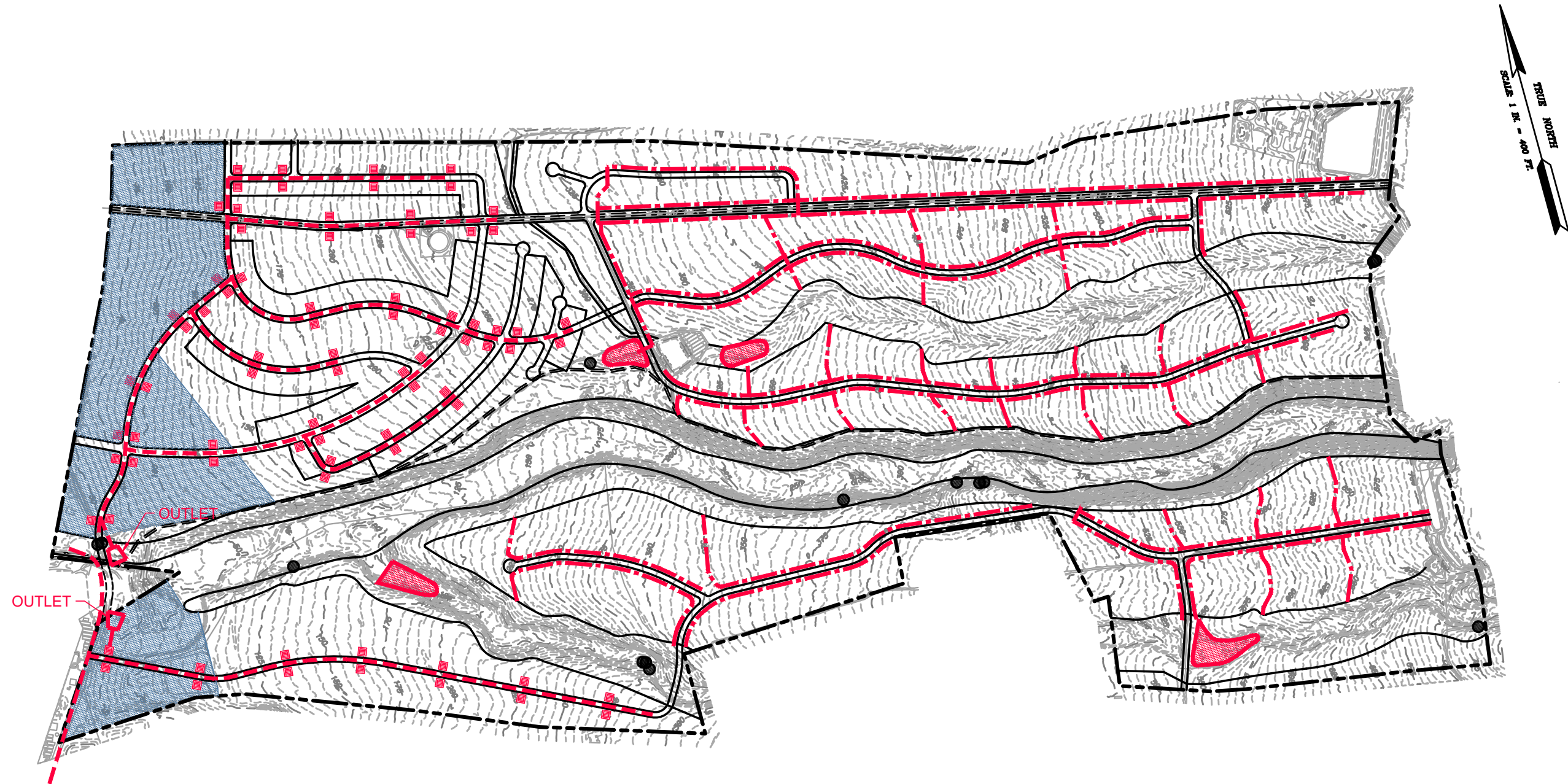
EXHIBIT 13
ALTERNATE A
PROPOSED SEWER SYSTEM
& R-1 WATER MAP (NO IWS)



LEGEND:
12" WATERLINE W/SIZE

0 400 800 1200 1600
SCALE: 1 IN. = 400 FT.

**EXHIBIT 14
ALTERNATE A
PROPOSED WATER SYSTEM MAP**



LEGEND:



GRASS ROADWAY SWALES

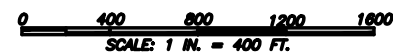
CATCH BASIN

DRAINLINE

OUTLET STRUCTURE

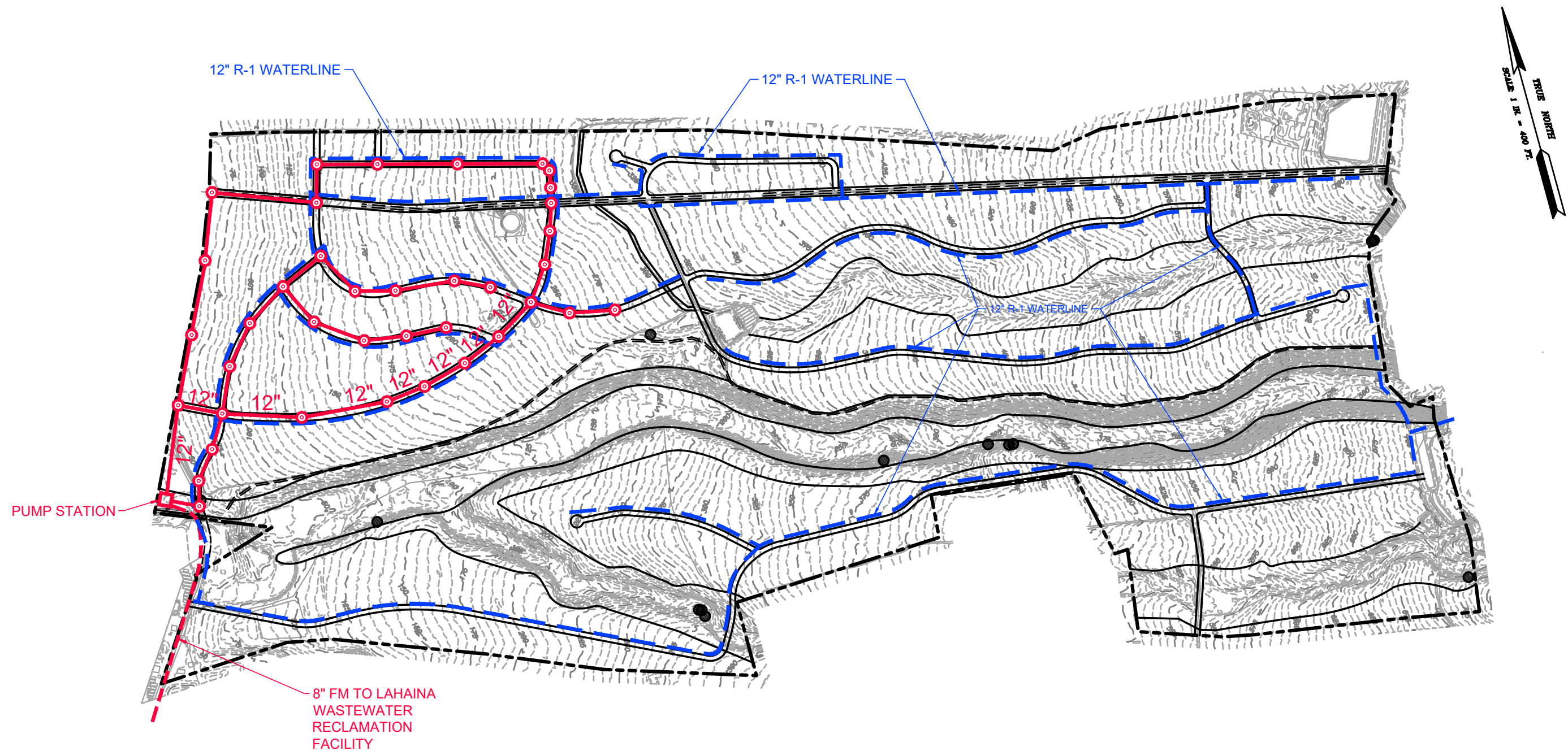
RETENTION BASIN

COMMERCIAL, INDUSTRIAL OR MULTI-FAMILY
PROJECTS TO INSTALL ONSITE DRAINAGE
MITIGATION



**EXHIBIT 15
ALTERNATE A
PROPOSED DRAINAGE SYSTEM MAP**

C:\2018 PROJECTS\2018-41\EXHIBITS\LOT-LAYOUT\AJ.Bj.dwg Nov. 18, 2021 12:02pm



NOTE - ALL SEWERLINES ARE
8" PVC UNLESS OTHERWISE
NOTED.

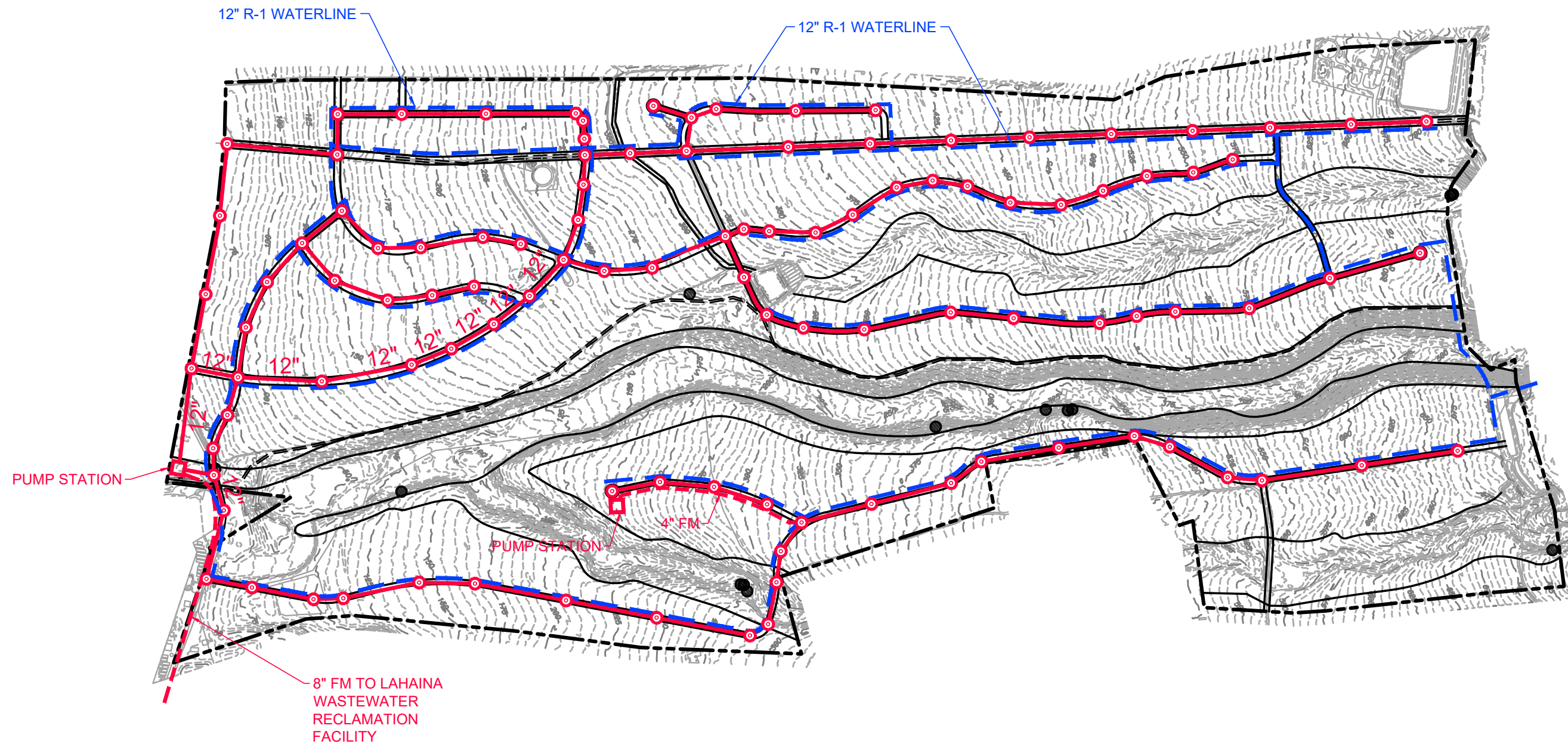
LEGEND:

	SEWER MANHOLE
	SEWERLINE W/SIZE
	SEWER PUMP STATION
	FORCEMAIN W/SIZE
	12" R-1 WATERLINE

0 400 800 1200 1600
SCALE: 1 IN. = 400 FT.

**EXHIBIT 16
ALTERNATE B
PROPOSED SEWER SYSTEM
& R-1 WATER (IWS FOR 1 - 2
ACRE LOTS) MAP**

C:\2018 PROJECTS\2018-41\EXHIBITS\LOT-LAYOUT\ALT B\dwg Nov. 18, 2021 1:03pm



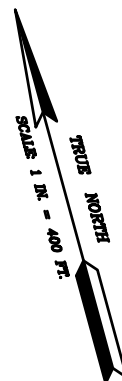
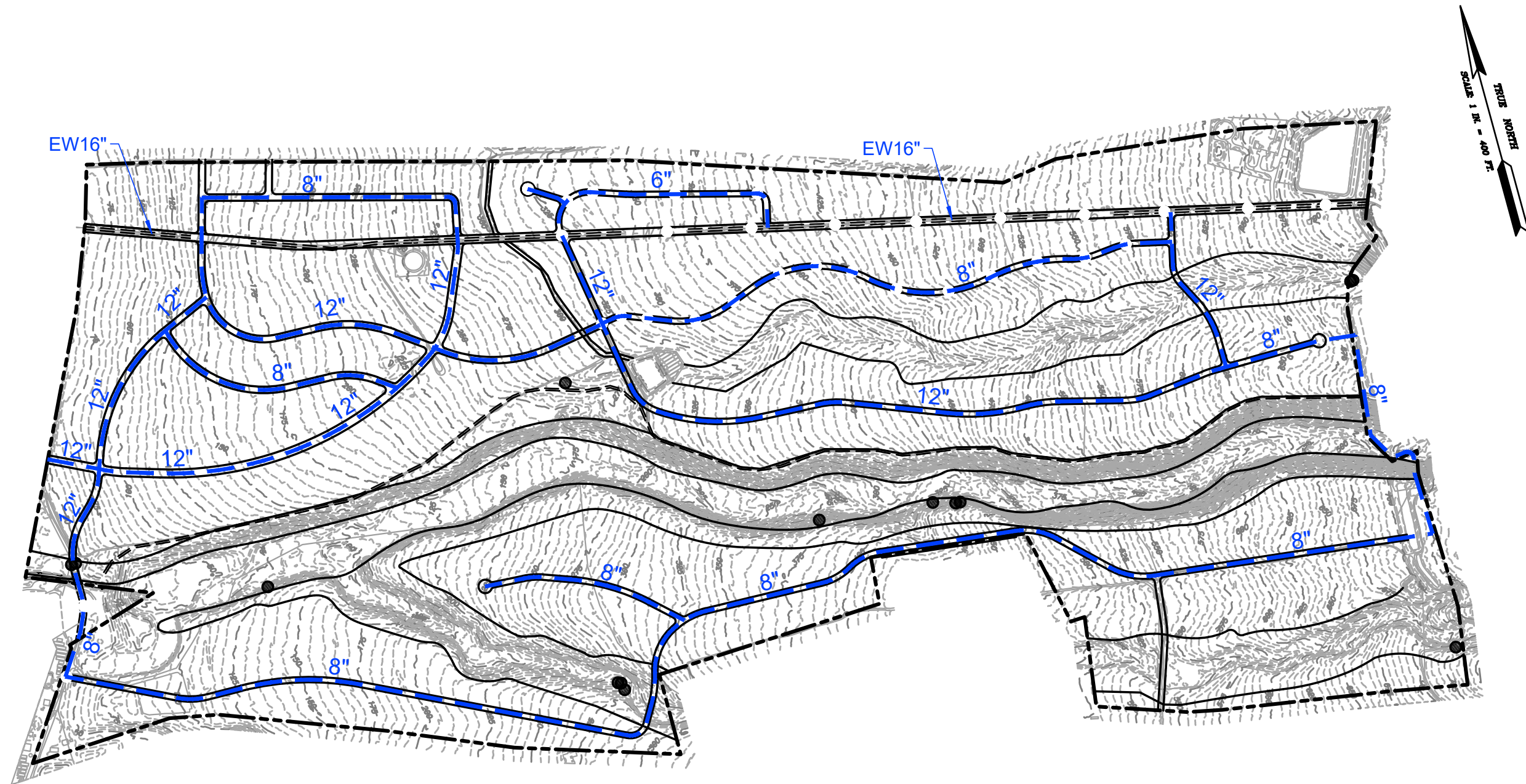
NOTE - ALL SEWERLINES ARE
8" PVC UNLESS OTHERWISE
NOTED.

LEGEND:

- | | |
|--|--------------------|
| | SEWER MANHOLE |
| | SEWERLINE W/SIZE |
| | SEWER PUMP STATION |
| | FORCEMAIN W/SIZE |
| | 12" R-1 WATERLINE |

0 400 800 1200 1600
SCALE: 1 IN. = 400 FT.

**EXHIBIT 17
ALTERNATE B
PROPOSED SEWER SYSTEM
& R-1 WATER MAP (NO IWS)**

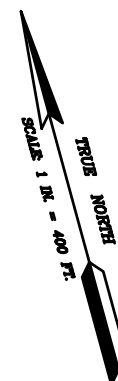


LEGEND:

12" WATERLINE W/SIZE

0 400 800 1200 1600
SCALE: 1 IN. = 400 FT.

EXHIBIT 18
ALTERNATE B
PROPOSED WATER SYSTEM MAP



LEGEND:

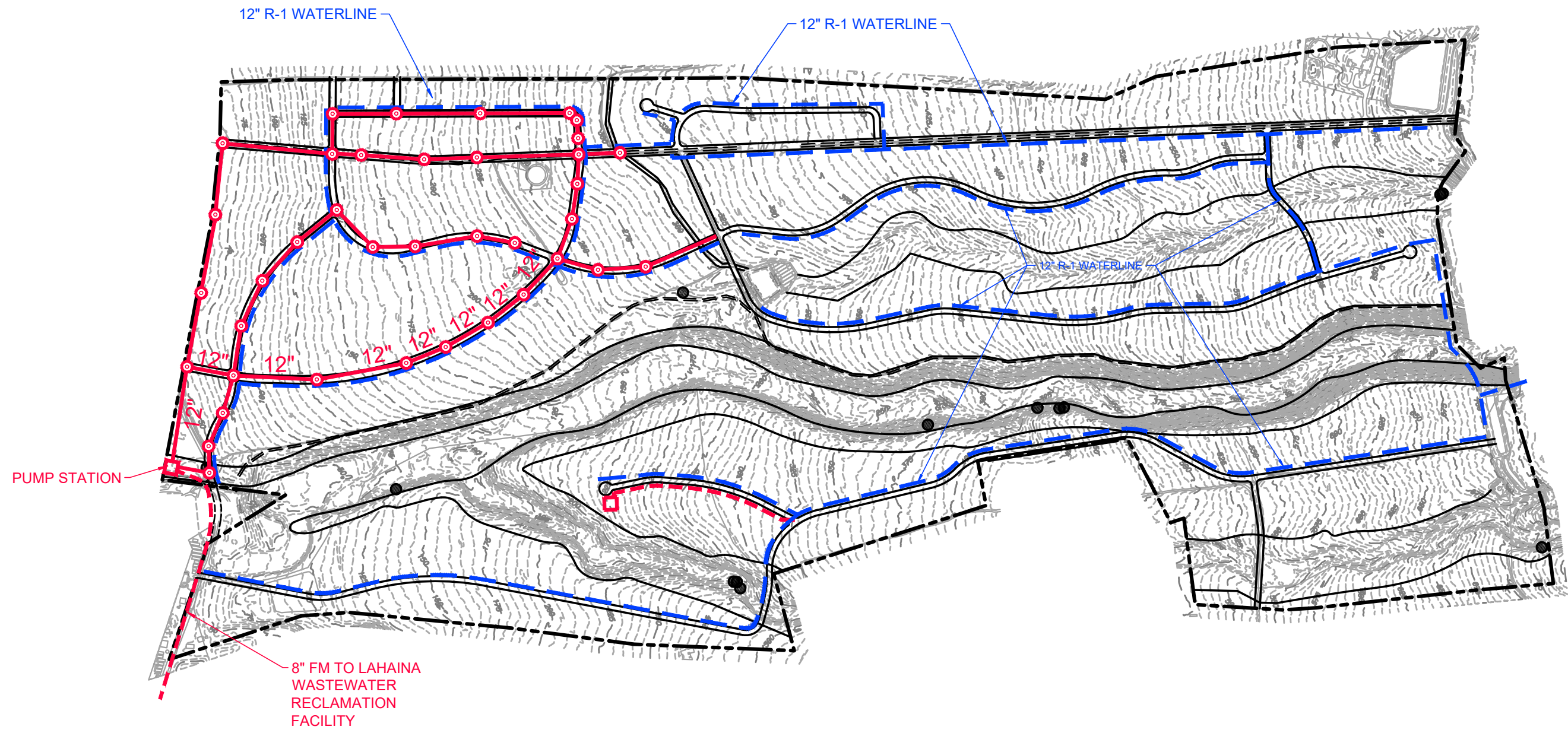


- GRASS ROADWAY SWALES
- CATCH BASIN
- DRAINLINE
- OUTLET STRUCTURE
- RETENTION BASIN
- COMMERCIAL, INDUSTRIAL OR MULTI-FAMILY
PROJECTS TO INSTALL ONSITE DRAINAGE
MITIGATION

0 400 800 1200 1600
SCALE: 1 IN. = 400 FT.

**EXHIBIT 19
ALTERNATE B
PROPOSED DRAINAGE SYSTEM MAP**

C:\2018 PROJECTS\2018-41\EXHIBITS\LOT-LAYOUT\AUT C.dwg Nov. 18, 2021 1:11pm



NOTE - ALL SEWERLINES ARE
8" PVC UNLESS OTHERWISE
NOTED.

LEGEND:

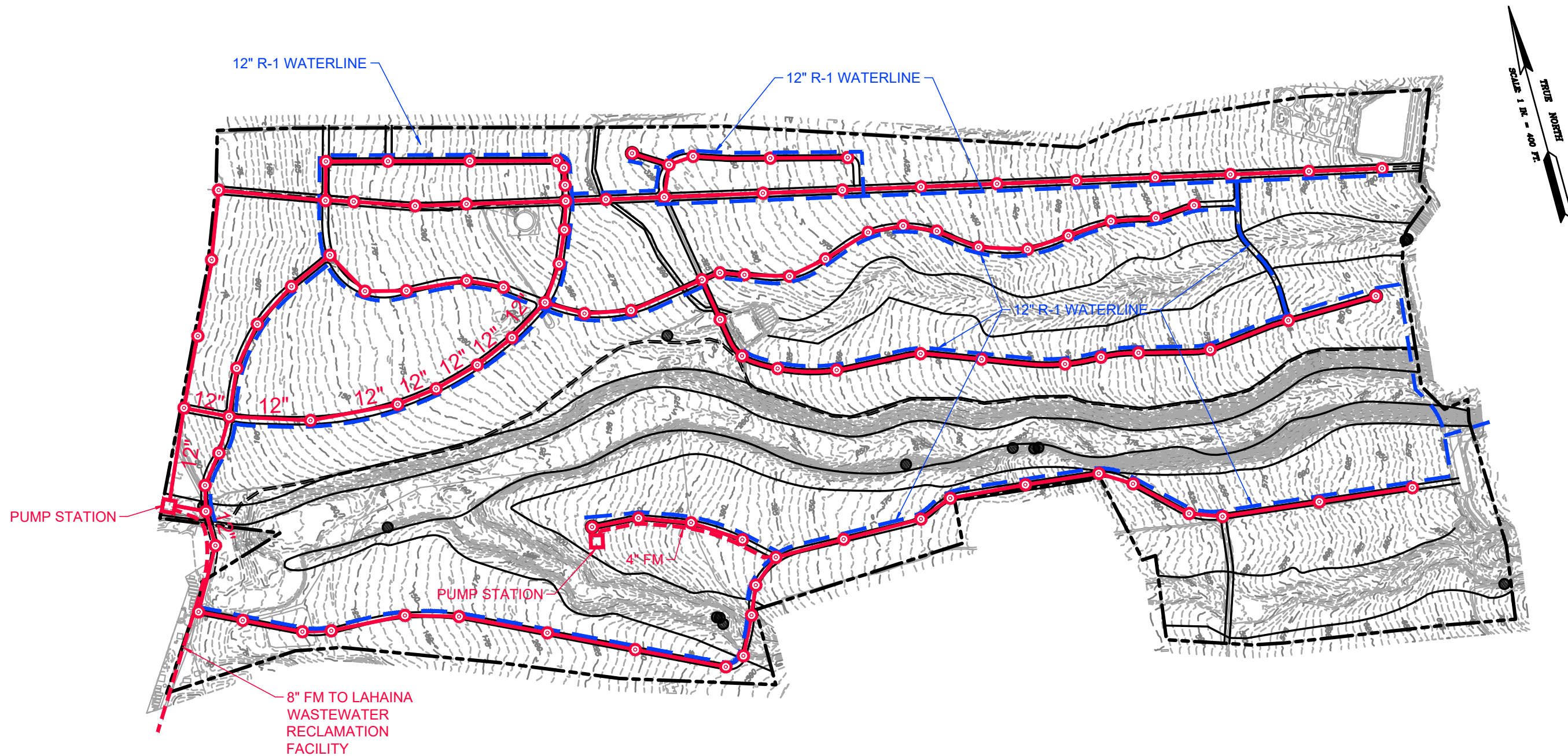


SEWER MANHOLE
SEWERLINE W/SIZE
SEWER PUMP STATION
FORCEMAIN W/SIZE
12" R-1 WATERLINE

0 400 800 1200 1600
SCALE: 1 IN. = 400 FT.

**EXHIBIT 20
ALTERNATE C
PROPOSED SEWER SYSTEM
& R-1 WATER (IWS FOR 1 - 2
ACRE LOTS) MAP**

C:\2018 PROJECTS\2018-41\EXHIBITS\LOT-LAYOUT\ALT C.dwg Nov. 18, 2021 1:12pm



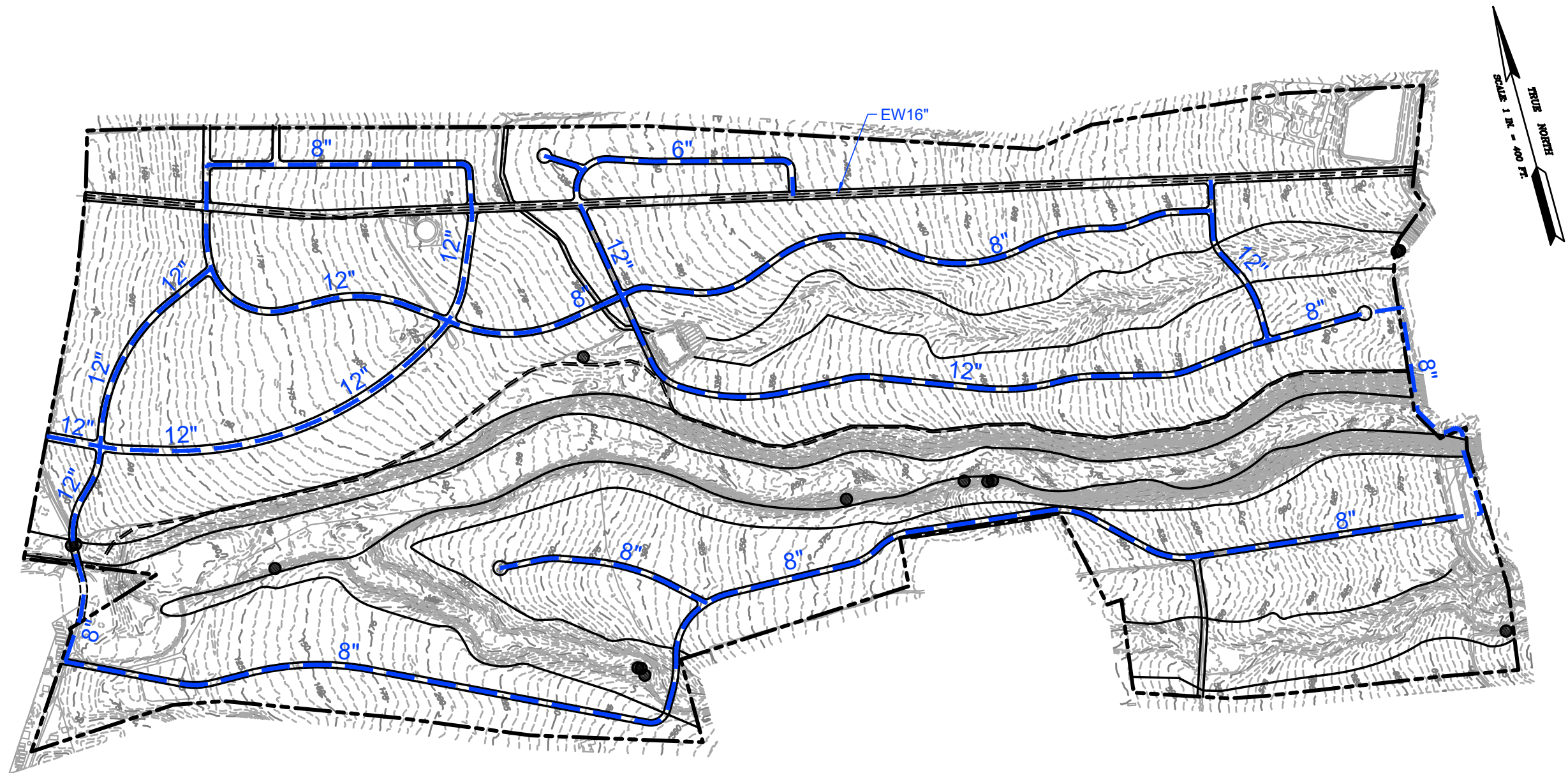
NOTE - ALL SEWERLINES ARE
8" PVC UNLESS OTHERWISE
NOTED.

LEGEND:

	SEWER MANHOLE
	SEWERLINE W/SIZE
	SEWER PUMP STATION
	FORCEMAIN W/SIZE
	12" R-1 WATERLINE

0 400 800 1200 1600
SCALE: 1 IN. = 400 FT.

EXHIBIT 21
ALTERNATE C
PROPOSED SEWER SYSTEM
& R-1 WATER MAP (NO IWS)



LEGEND:

12" WATERLINE W/SIZE

0 400 800 1200 1600
SCALE: 1 IN. = 400 FT.

EXHIBIT 22
ALTERNATE C
PROPOSED WATER SYSTEM MAP

LEGEND:

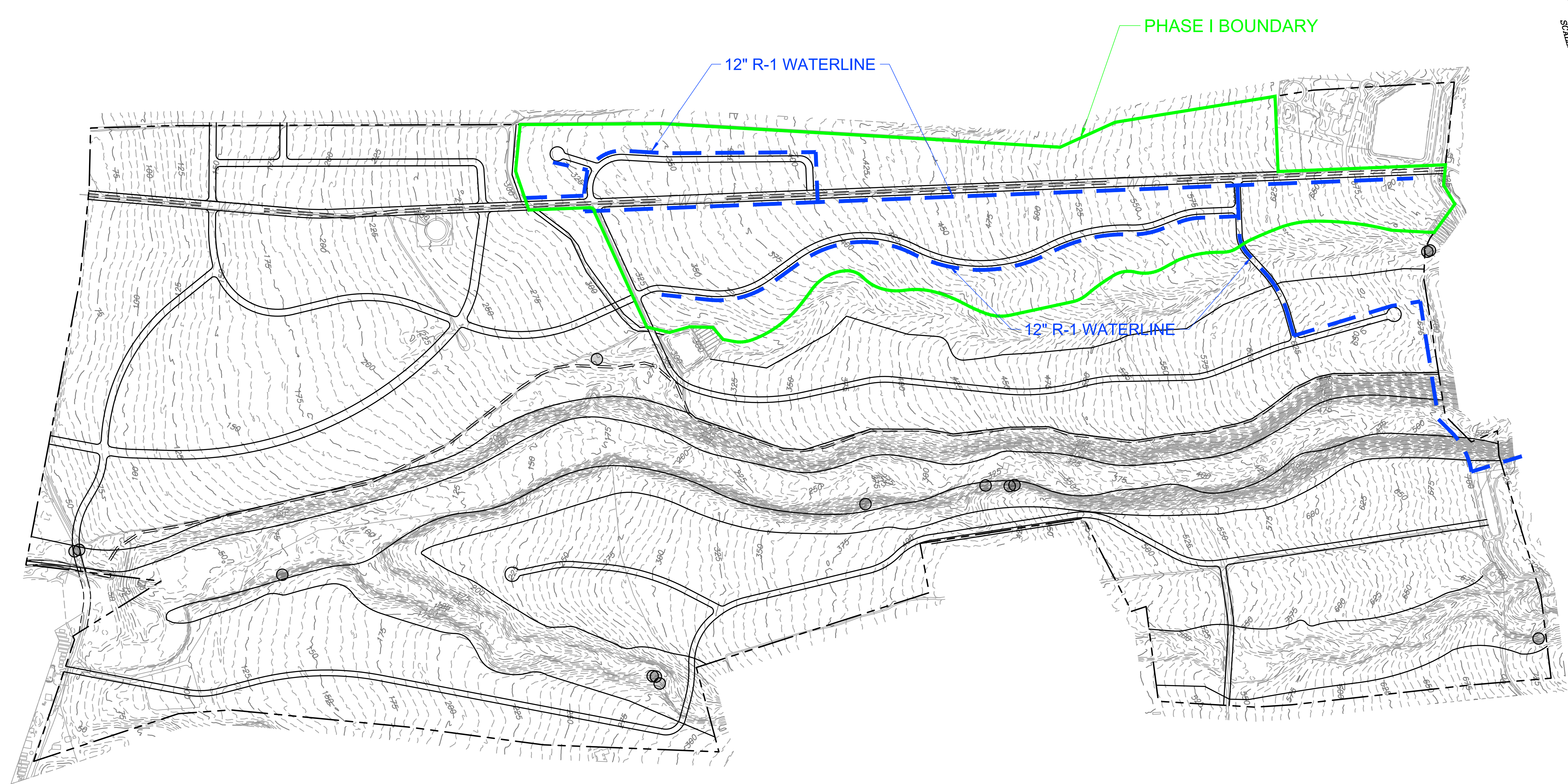
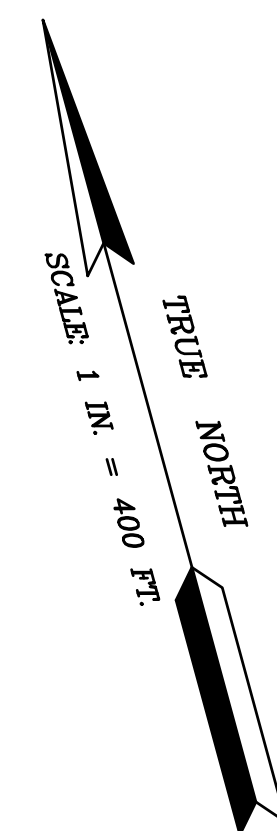


- GRASS ROADWAY SWALES
- CATCH BASIN
- DRAINLINE
- OUTLET STRUCTURE
- RETENTION BASIN
- COMMERCIAL, INDUSTRIAL OR MULTI-FAMILY
PROJECTS TO INSTALL ONSITE DRAINAGE
MITIGATION

0 400 800 1200 1600
SCALE: 1 IN. = 400 FT.



EXHIBIT 23
ALTERNATE C
PROPOSED DRAINAGE SYSTEM MAP



NOTE - ALL SEWERLINES ARE
8" PVC UNLESS OTHERWISE
NOTED.

- LEGEND:**
- PHASE I BOUNDARY
 - - - - 12" R-1 WATERLINE

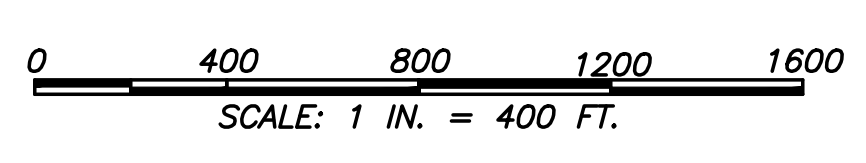
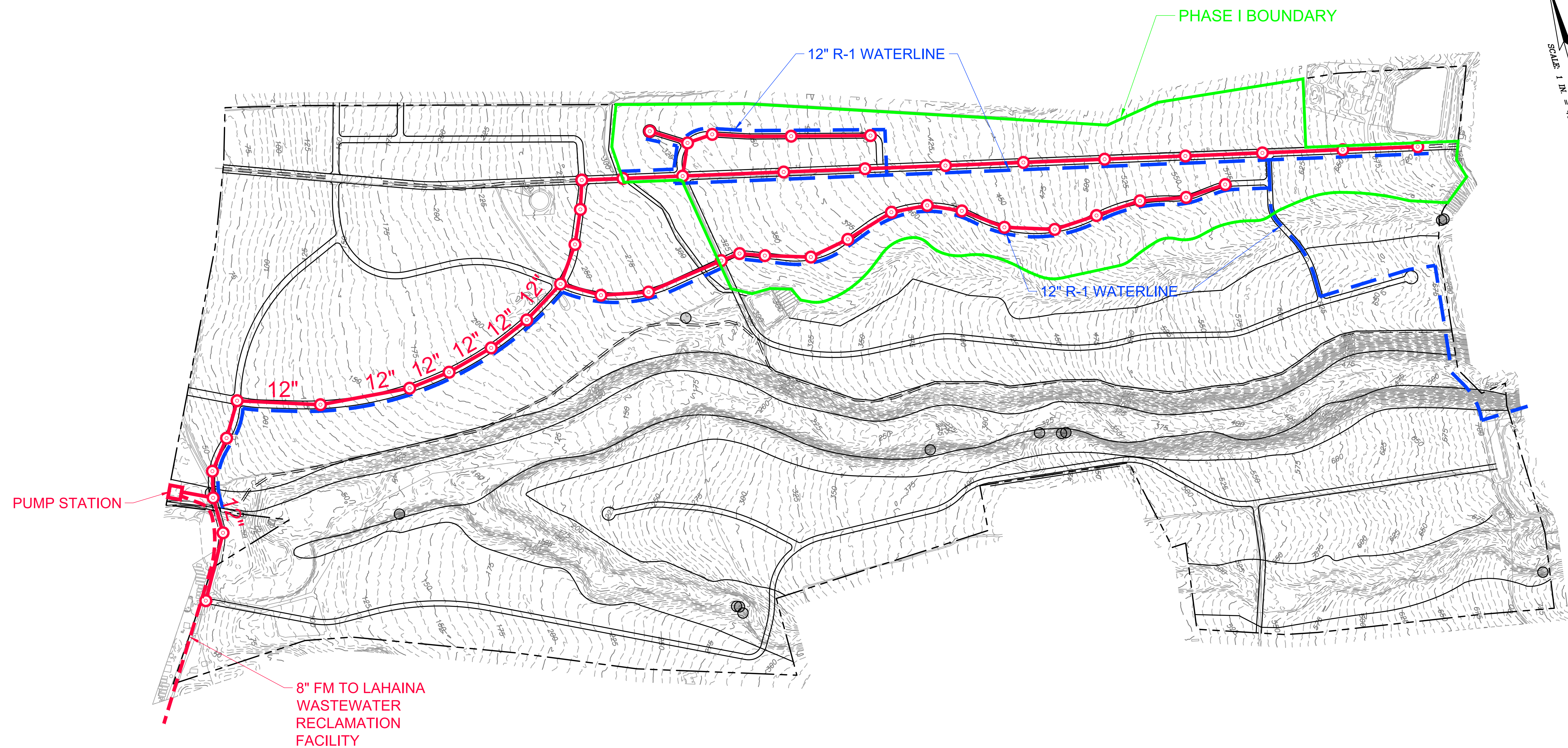
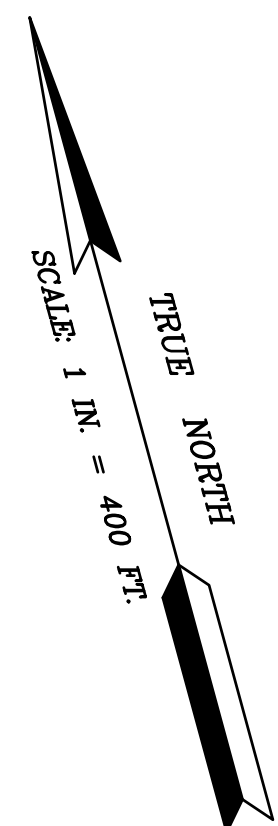


EXHIBIT 24
ALTERNATE C (PHASE I)
PROPOSED SEWER SYSTEM
& R-1 WATER (IWS FOR 1 - 2
ACRE LOTS) MAP



NOTE - ALL SEWERLINES ARE
8" PVC UNLESS OTHERWISE
NOTED.

LEGEND:

- | | |
|--|--------------------|
| | PHASE I BOUNDARY |
| | SEWER MANHOLE |
| | SEWERLINE W/SIZE |
| | SEWER PUMP STATION |
| | FORCEMAIN W/SIZE |
| | 12" R-1 WATERLINE |

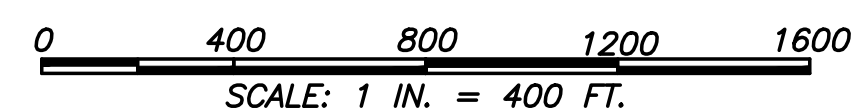
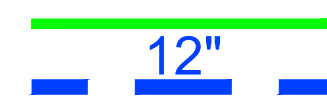


EXHIBIT 25
ALTERNATE C (PHASE I)
PROPOSED SEWER SYSTEM
& R-1 WATER MAP (NO IWS)

C:\2018 PROJECTS\2018-41\EXHIBITS\LOT-LAYOUT\ALT C\PH.dwg Date: 03/20/21 11:52am

LEGEND:



PHASE I BOUNDARY
WATERLINE W/SIZE

0 400 800 1200 1600
SCALE: 1 IN. = 400 FT.

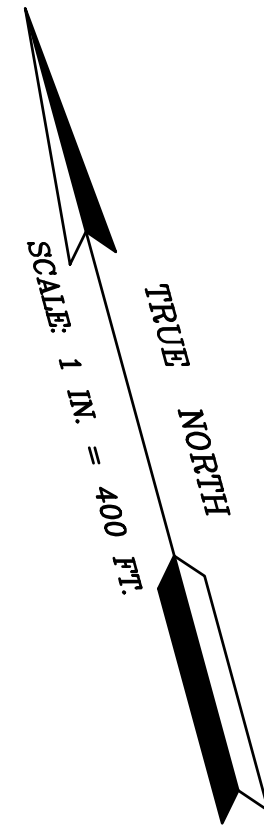
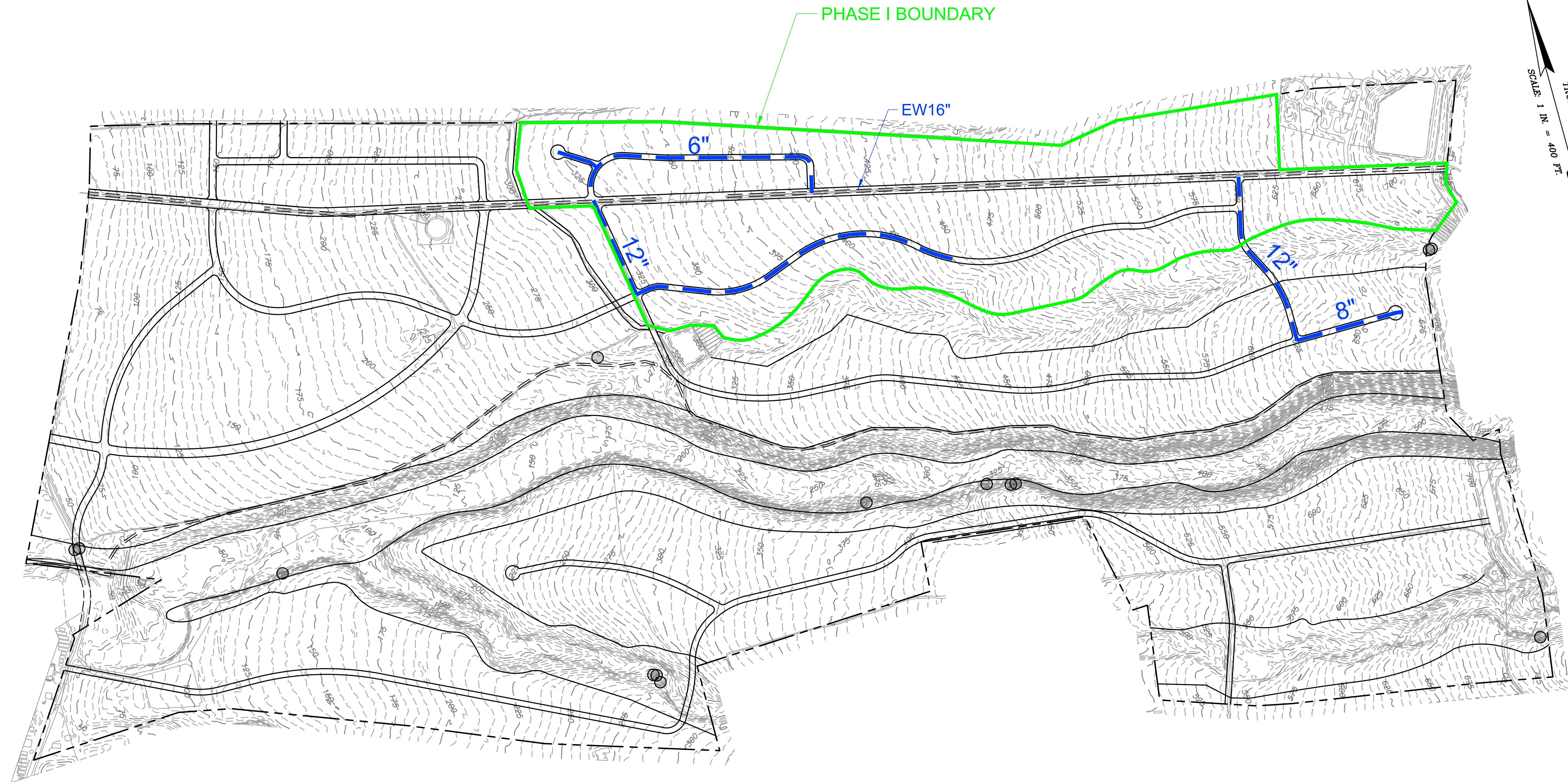


EXHIBIT 26
ALTERNATE C (PHASE I)
PROPOSED WATER SYSTEM MAP

TRUE NORTH
SCALE: 1 IN. = 400 FT.

PHASE I BOUNDARY



LEGEND:

- PHASE I BOUNDARY
- GRASS ROADWAY SWALES
- RETENTION BASIN
- COMMERCIAL, INDUSTRIAL OR MULTI-FAMILY PROJECTS TO INSTALL ONSITE DRAINAGE MITIGATION

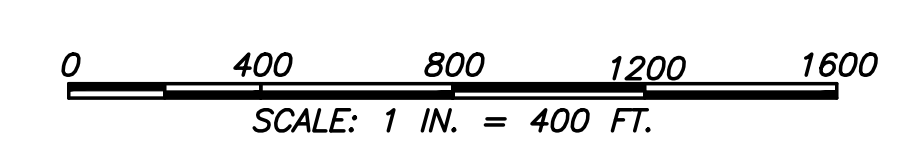
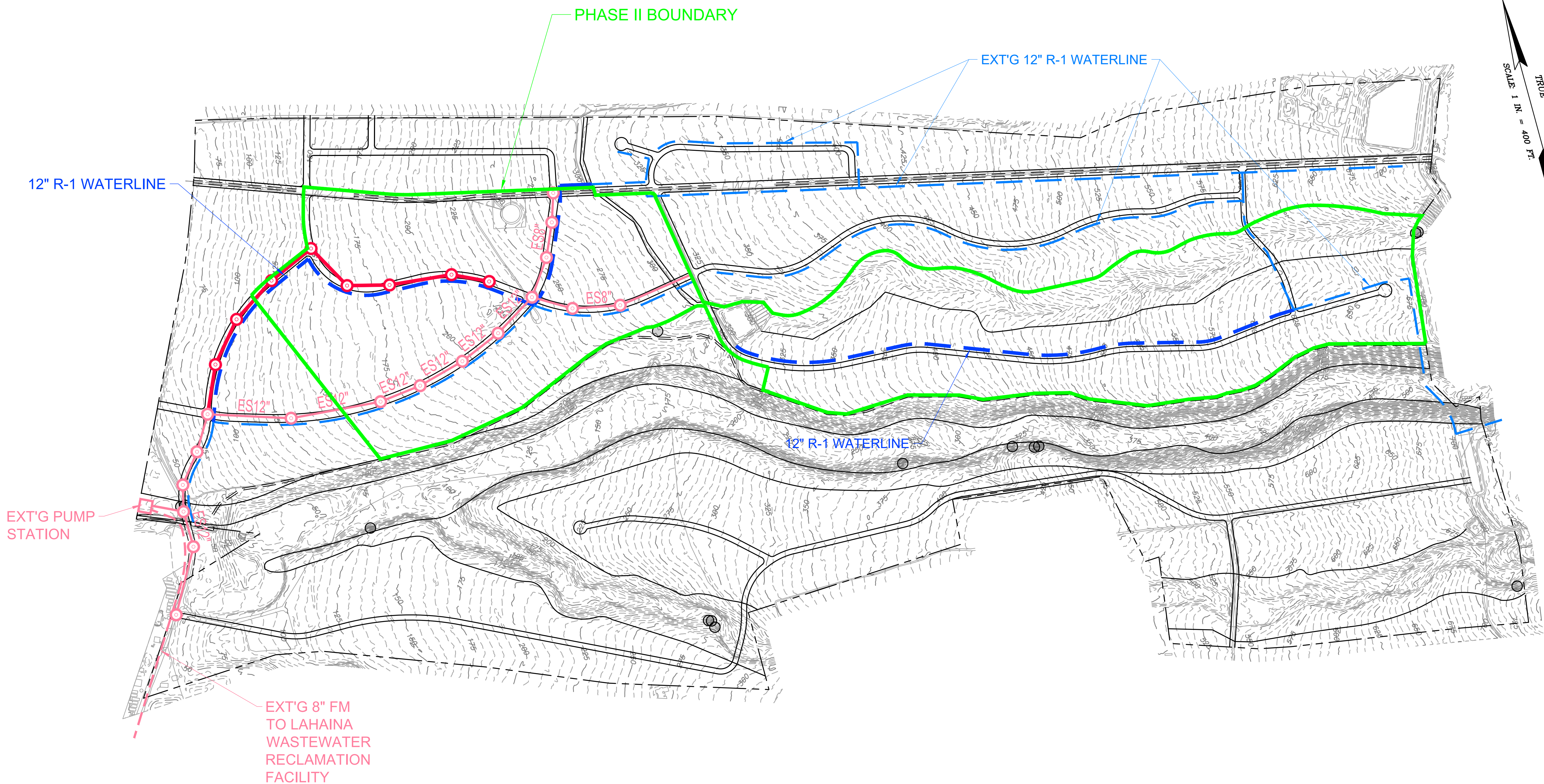
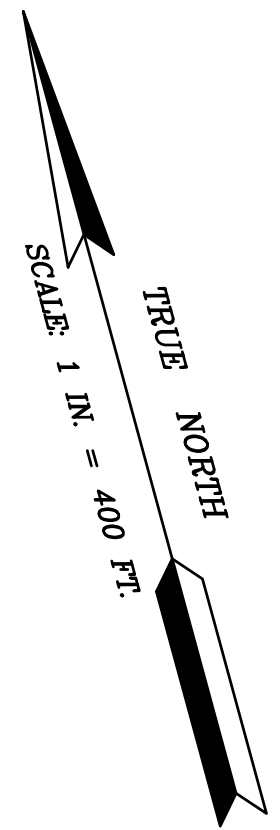


EXHIBIT 27
ALTERNATE C (PHASE I)
PROPOSED DRAINAGE SYSTEM MAP



NOTE - ALL SEWERLINES ARE
8" PVC UNLESS OTHERWISE
NOTED.

LEGEND:	
	PHASE II BOUNDARY
	SEWER MANHOLE
	EXT'G SEWER MANHOLE
	SEWERLINE W/SIZE
	EXT'G SEWERLINE W/SIZE
	SEWER PUMP STATION
	EXT'G SEWER PUMP STATION
	FORCEMAIN W/SIZE
	EXT'G FORCEMAIN W/SIZE
	12" R-1 WATERLINE
	EXT'G 12" R-1 WATERLINE

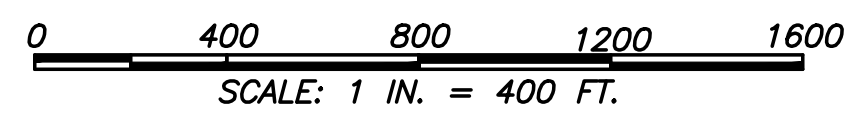
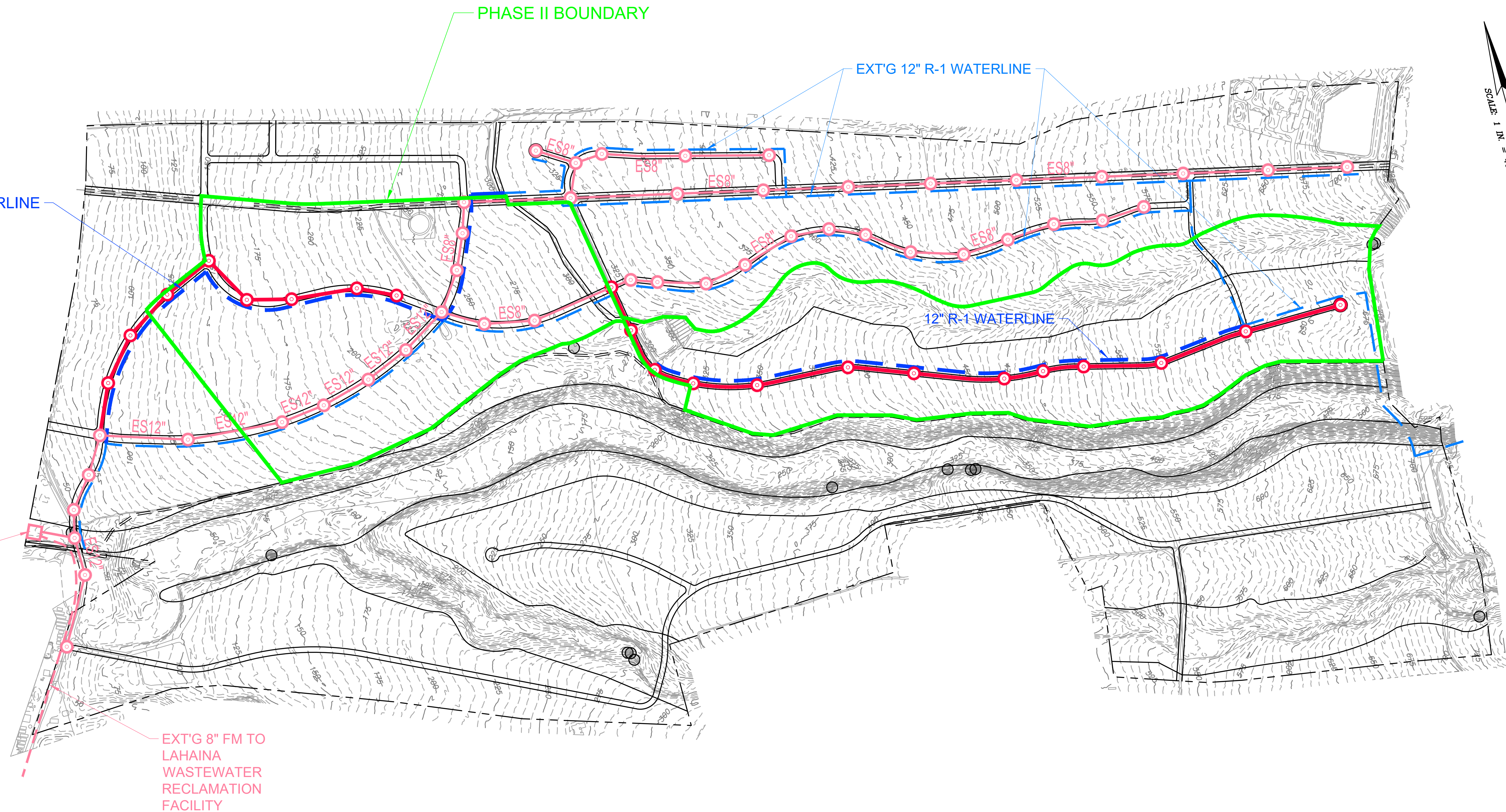
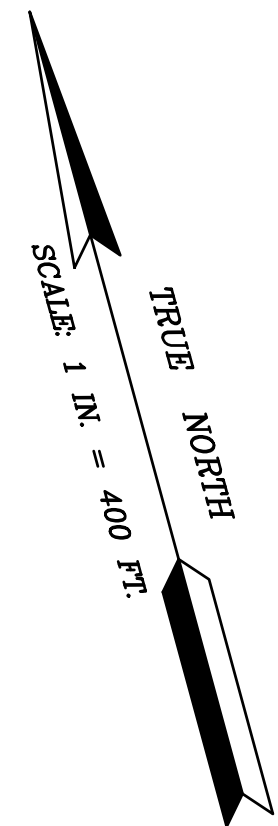


EXHIBIT 28
ALTERNATE C (PHASE II)
PROPOSED SEWER SYSTEM
& R-1 WATER MAP



NOTE - ALL SEWERLINES ARE
8" PVC UNLESS OTHERWISE
NOTED.

LEGEND:

	PHASE II BOUNDARY
	SEWER MANHOLE
	EXT'G SEWER MANHOLE
	SEWERLINE W/SIZE
	EXT'G SEWERLINE W/SIZE
	SEWER PUMP STATION
	EXT'G SEWER PUMP STATION
	FORCEMAIN W/SIZE
	EXT'G FORCEMAIN W/SIZE
	12" R-1 WATERLINE
	EXT'G 12" R-1 WATERLINE

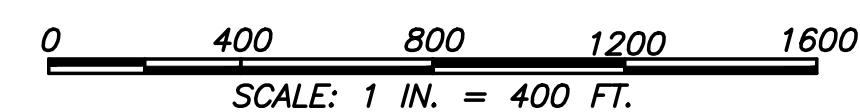
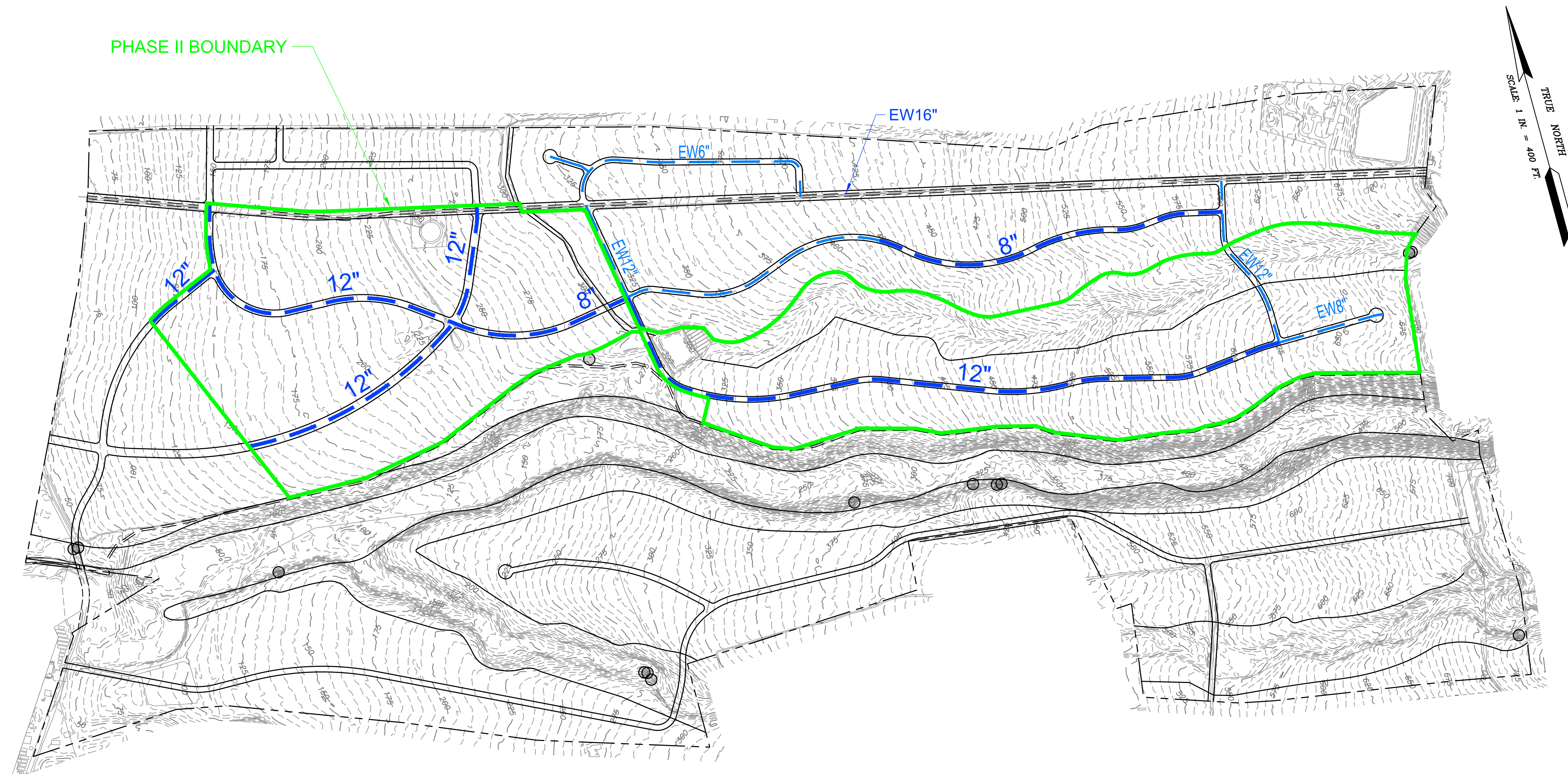


EXHIBIT 29
ALTERNATE C (PHASE II)
PROPOSED SEWER SYSTEM
& R-1 WATER MAP (NO IWS)



TRUE NORTH
SCALE: 1 IN. = 400 FT.

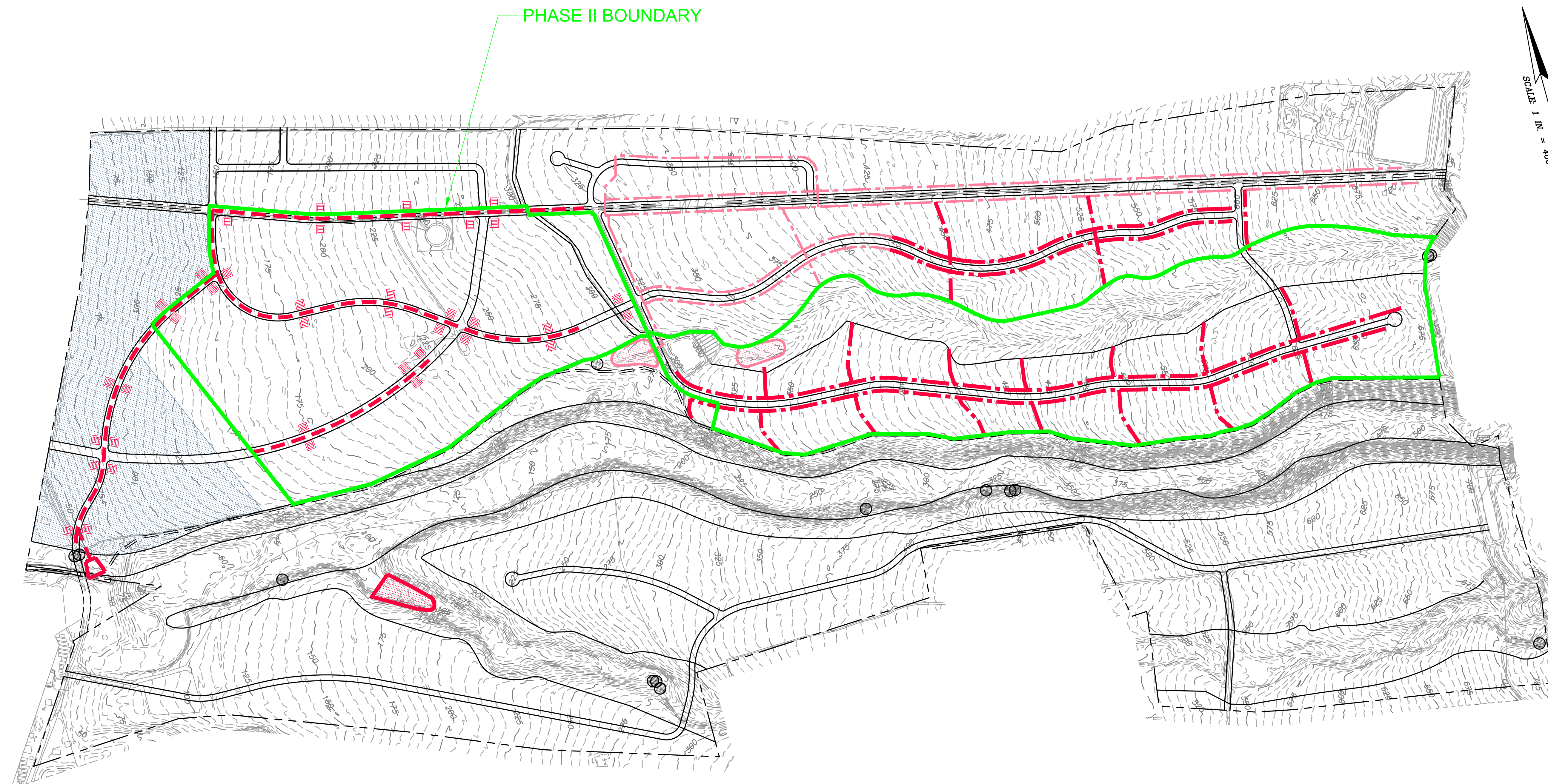
LEGEND:

	PHASE II BOUNDARY
	WATERLINE W/SIZE
	EXT'G WATERLINE W/SIZE

0 400 800 1200 1600
SCALE: 1 IN. = 400 FT.

EXHIBIT 30 ALTERNATE C (PHASE II) PROPOSED WATER SYSTEM MAP

TRUE NORTH
SCALE: 1 IN. = 400 FT.



LEGEND:

- PHASE II BOUNDARY
- GRASS ROADWAY SWALES
- EXT'G GRASS ROADWAY SWALES
- CATCH BASIN
- DRAINLINE
- OUTLET STRUCTURE
- RETENTION BASIN
- EXT'G RETENTION BASIN
- COMMERCIAL, INDUSTRIAL OR MULTI-FAMILY PROJECTS TO INSTALL ONSITE DRAINAGE MITIGATION

0 400 800 1200 1600
SCALE: 1 IN. = 400 FT.

EXHIBIT 31
ALTERNATE C (PHASE II)
PROPOSED DRAINAGE SYSTEM MAP

APPENDIX A

HYDROLOGIC CALCULATIONS

Hydrologic Calculations

Purpose: Determine the increase in onsite surface runoff due to the development of the project site based on a 100-year, 24-hour storm.

A. Determine the 100-year, 24-hour rainfall:

$$I_{100} = 12.0 \text{ inches}$$

C. Drainage Area (A) = 800 Acres

D. Compute the 100-year, 24-hour storm runoff volume (see attached hydrographs).

$$Q(\text{existing}) = 781 \text{ cfs}$$

$$Q(\text{developed}) = 1,452 \text{ cfs}$$

The increase in runoff due to the proposed development is $1,452 \text{ cfs} - 781 \text{ cfs} = 671 \text{ cfs}$. The increase in runoff volume due to the proposed development is $13,476,716 \text{ cubic feet} - 9,601,148 \text{ cubic feet} = 3,875,568 \text{ cubic feet}$.

Hydrograph Report

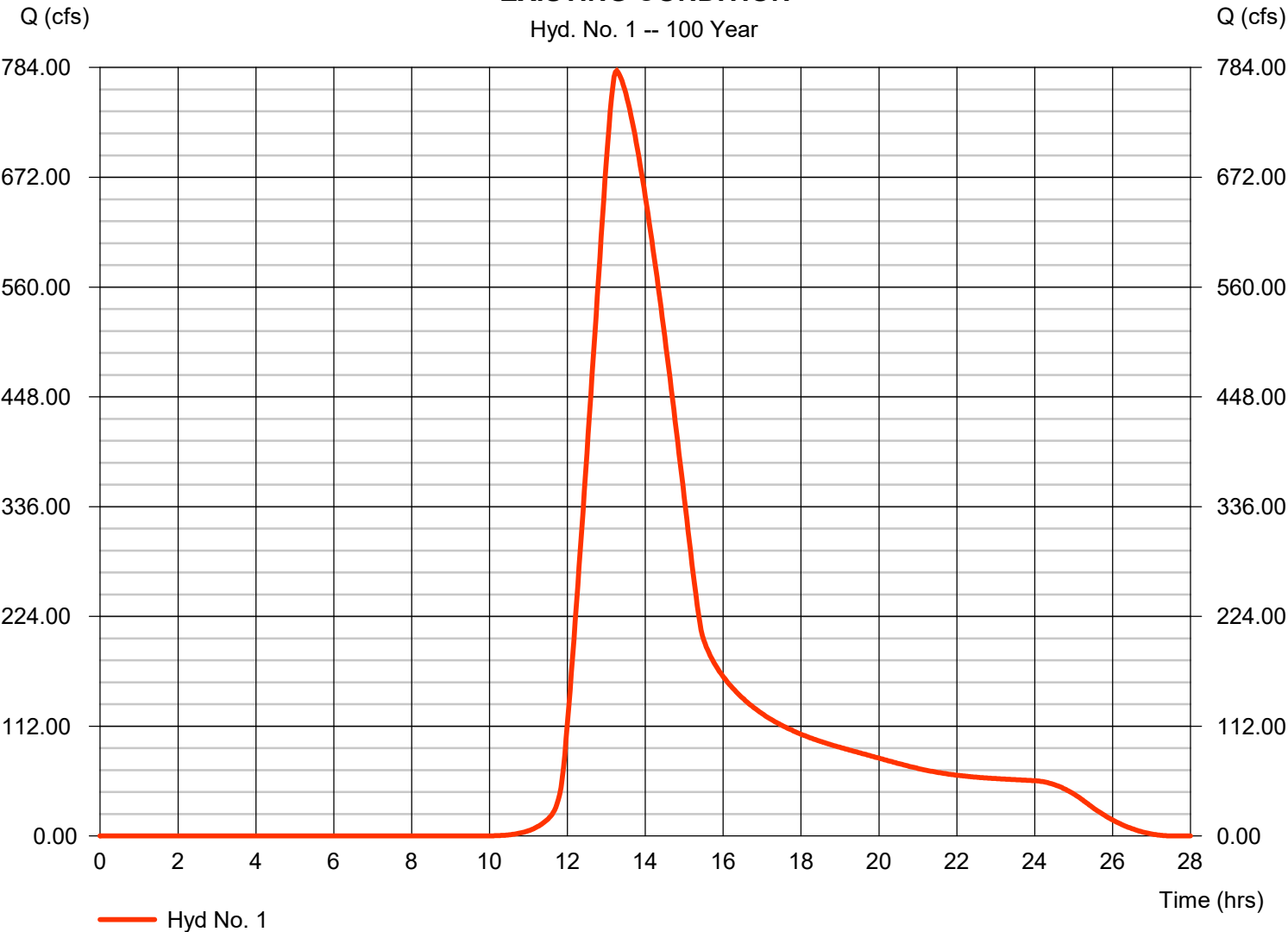
Hyd. No. 1

EXISTING CONDITION

Hydrograph type	=	SCS Runoff	Peak discharge	=	780.69 cfs
Storm frequency	=	100 yrs	Time to peak	=	13.27 hrs
Time interval	=	2 min	Hyd. volume	=	9,601,148 cuft
Drainage area	=	800.000 ac	Curve number	=	60
Basin Slope	=	6.6 %	Hydraulic length	=	10000 ft
Tc method	=	TR55	Time of conc. (Tc)	=	135.40 min
Total precip.	=	7.95 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

EXISTING CONDITION

Hyd. No. 1 -- 100 Year



Hydrograph Report

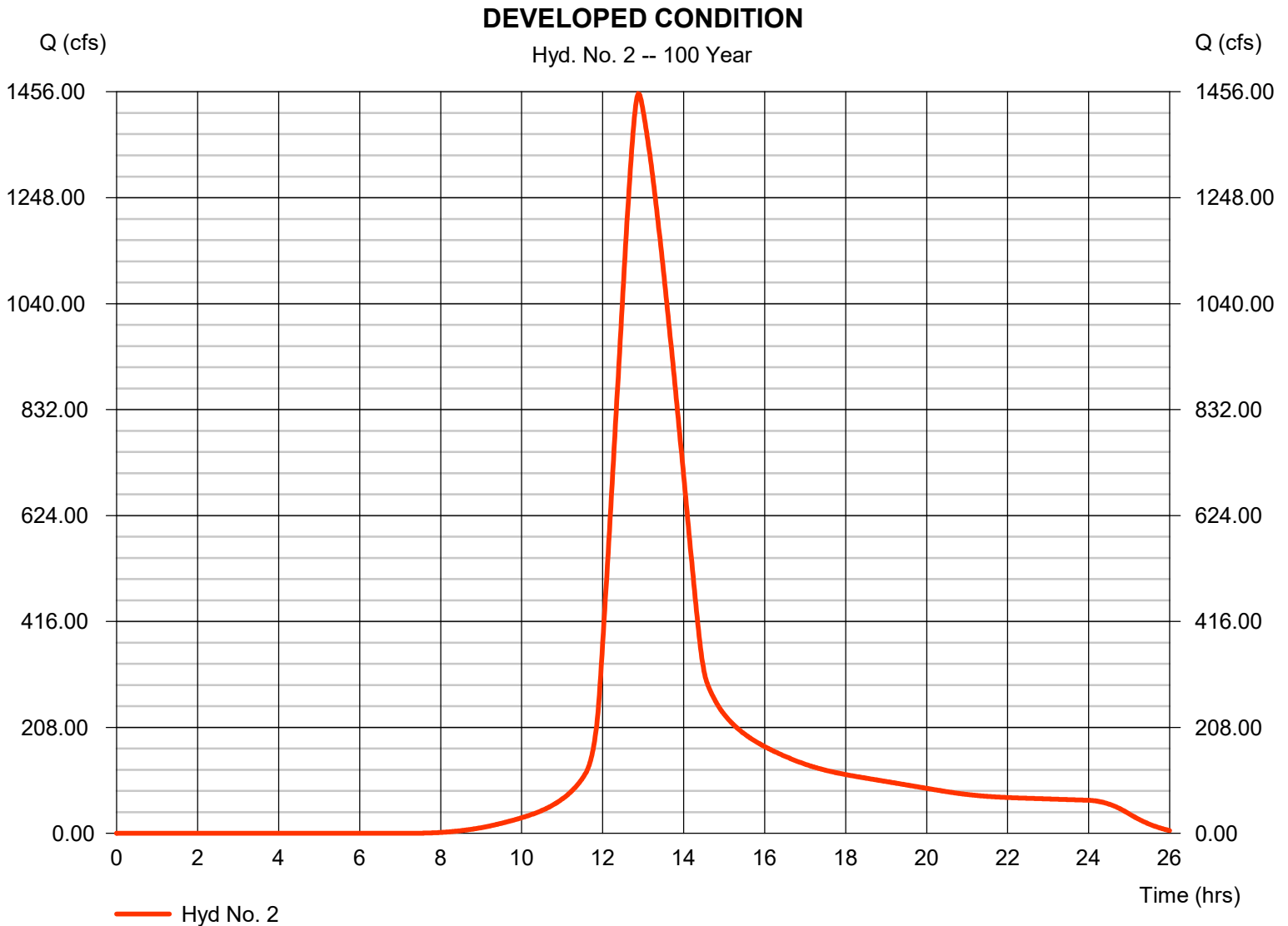
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Sunday, 08 / 16 / 2020

Hyd. No. 2

DEVELOPED CONDITION

Hydrograph type	= SCS Runoff	Peak discharge	= 1452.10 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.88 hrs
Time interval	= 1 min	Hyd. volume	= 13,476,716 cuft
Drainage area	= 800.000 ac	Curve number	= 72
Basin Slope	= 6.6 %	Hydraulic length	= 10000 ft
Tc method	= LAG	Time of conc. (Tc)	= 98.81 min
Total precip.	= 7.95 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



APPENDIX B

DOMESTIC WATER DEMAND CALCULATIONS

ALTERNATE A DOMESTIC WATER DEMAND CALCULATIONS

Land Use	Area (Ac.) or Units	Average Unit Demand	Average Total Demand (gpd)
Single-Family	0 Lots	600 gpd/unit	0
Homestead Ag (1/2 Ac.)	176 Lots	600 gpd/unit	105,600
Homestead Ag (1-2 Ac.)	252 Lots	600 gpd/unit	151,200
Multi-Family	262 Units	560 gpd/unit	146,720
Industrial	16 Acres	6,000 gpd/ac	96,000
Community Use: Commercial	28 Acres	6,000 gpd/ac	168,000
Total Average Daily Demand*			667,520 gpd

ALTERNATE B DOMESTIC WATER DEMAND CALCULATIONS

Land Use	Area (Ac.) or Units	Average Unit Demand	Average Total Demand (gpd)
Single-Family	0 Lots	600 gpd/unit	0
Homestead Ag (1/2 Ac.)	0 Lots	600 gpd/unit	0
Homestead Ag (1-2 Ac.)	357 Lots	600 gpd/unit	214,200
Multi-Family	262 Units	560 gpd/unit	146,720
Industrial	16 Acres	6,000 gpd/ac	96,000
Community Use: Commercial	28 Acres	6,000 gpd/ac	168,000
Total Average Daily Demand*			624,920 gpd

* Total Average Daily Demand does not include Homestead Supplemental Ag and Community Use Ag, Parks. It is assumed that irrigation will be from a non-potable source.

ALTERNATE C DOMESTIC WATER DEMAND CALCULATIONS

Land Use	Area (Ac.) or Units	Average Unit Demand	Average Total Demand (gpd)
Single-Family	356 Lots	600 gpd/unit	213,600
Homestead Ag (1/2 Ac.)	0 Lots	600 gpd/unit	0
Homestead Ag (1-2 Ac.)	252 Lots	600 gpd/unit	151,200
Multi-Family	573 Units	560 gpd/unit	320,880
Industrial	16 Acres	6,000 gpd/ac	96,000
Community Use: Commercial	28 Acres	6,000 gpd/ac	168,000
Total Average Daily Demand*			949,680 gpd

- * Total Average Daily Demand does not include Homestead Supplemental Ag and Community Use Ag Parks. It is assumed that irrigation will be from a non-potable source.

ALTERNATE C - PHASE I DOMESTIC WATER DEMAND CALCULATIONS

Land Use	Area (Ac.) or Units	Average Unit Demand	Average Total Demand (gpd)
Single-Family	0 Lots	600 gpd/unit	0
Homestead Ag (1/2 Ac.)	0 Lots	600 gpd/unit	0
Homestead Ag (1-2 Ac.)	56 Lots	600 gpd/unit	33,600
Multi-Family	0 Units	560 gpd/unit	0
Industrial	0 Acres	6,000 gpd/ac	0
Community Use: Commercial	0 Acres	6,000 gpd/ac	0
Total Average Daily Demand*			33,600 gpd

- * Total Average Daily Demand does not include Homestead Supplemental Ag and Community Use Ag Parks. It is assumed that irrigation will be from a non-potable source.

ALTERNATE C – PHASE II DOMESTIC WATER DEMAND CALCULATIONS

Land Use	Area (Ac.) or Units	Average Unit Demand	Average Total Demand (gpd)
Single-Family	356 Lots	600 gpd/unit	213,600
Homestead Ag (1/2 Ac.)	0 Lots	600 gpd/unit	0
Homestead Ag (1-2 Ac.)	38 Lots	600 gpd/unit	22,800
Multi-Family	0 Units	560 gpd/unit	0
Industrial	0 Acres	6,000 gpd/ac	0
Community Use: Commercial	0 Acres	6,000 gpd/ac	0
Total Average Daily Demand*			236,400 gpd

- * Total Average Daily Demand does not include Homestead Supplemental Ag and Community Use Ag Parks. It is assumed that irrigation will be from a non-potable source.

APPENDIX C

WASTEWATER CALCULATIONS

ALTERNATE A WASTEWATER FLOW CALCULATIONS

Land Use	Area (Ac.) or Units	Average Unit Demand	Average Total Demand (gpd)
Single-Family	0 Lots	350 gpd/unit	0
Homestead Ag (1/2 Ac.)	163 Lots	350 gpd/unit	57,050
Homestead Ag (1-2 Ac.)	252 Lots	350 gpd/unit	88,200
Multi-Family	262 Units	255 gpd/unit	66,810
Industrial	16 Acres	25 gpd/unit @ 20 units/ac	8,000
Community Use: Commercial	28 Acres	25 gpd/unit @ 20 units/ac	14,000
Average Daily Flow Rate*			234,060 gpd

ALTERNATE B WASTEWATER FLOW CALCULATIONS

Land Use	Area (Ac.) or Units	Average Unit Demand	Average Total Demand (gpd)
Single-Family	0 Lots	350 gpd/unit	0
Homestead Ag (1/2 Ac.)	0 Lots	350 gpd/unit	0
Homestead Ag (1-2 Ac.)	350 Lots	350 gpd/unit	122,500
Multi-Family	262 Units	255 gpd/unit	66,810
Industrial	16 Acres	25 gpd/unit @ 20 units/ac	8,000
Community Use: Commercial	28 Acres	25 gpd/unit @ 20 units/ac	14,000
Average Daily Flow Rate*			211,310 gpd

- * Wastewater Flow Calculations does not include Homestead Supplemental Ag, Community Use Ag and Parks. It is assumed that these uses will not generate any wastewater.

ALTERNATE C WASTEWATER FLOW CALCULATIONS

Land Use	Area (Ac.) or Units	Average Unit Demand	Average Total Demand (gpd)
Single-Family	356 Lots	350 gpd/unit	124,600
Homestead Ag (1/2 Ac.)	0 Lots	350 gpd/unit	0
Homestead Ag (1-2 Ac.)	252 Lots	350 gpd/unit	88,200
Multi-Family	573 Units	255 gpd/unit	146,115
Industrial	16 Acres	25 gpd/unit @ 20 units/ac	8,000
Community Use: Commercial	28 Acres	25 gpd/unit @ 20 units/ac	14,000
Average Daily Flow Rate*			380,915 gpd

* Wastewater Flow Calculations does not include Homestead Supplemental Ag, Community Use Ag and Parks. It is assumed that these uses will not generate any wastewater.

ALTERNATE C – PHASE I WASTEWATER FLOW CALCULATIONS

Land Use	Area (Ac.) or Units	Average Unit Demand	Average Total Demand (gpd)
Single-Family	0 Lots	350 gpd/unit	0
Homestead Ag (1/2 Ac.)	0 Lots	350 gpd/unit	0
Homestead Ag (1-2 Ac.)	56 Lots	350 gpd/unit	19,600
Multi-Family	0 Units	255 gpd/unit	0
Industrial	0 Acres	25 gpd/unit @ 20 units/ac	0
Community Use: Commercial	0 Acres	25 gpd/unit @ 20 units/ac	0
Average Daily Flow Rate*			19,600 gpd

* Wastewater Flow Calculations does not include Homestead Supplemental Ag, Community Use Ag and Parks. It is assumed that these uses will not generate any wastewater.

ALTERNATE C – PHASE II WASTEWATER FLOW CALCULATIONS

Land Use	Area (Ac.) or Units	Average Unit Demand	Average Total Demand (gpd)
Single-Family	356 Lots	350 gpd/unit	124,600
Homestead Ag (1/2 Ac.)	0 Lots	350 gpd/unit	0
Homestead Ag (1-2 Ac.)	38 Lots	350 gpd/unit	13,300
Multi-Family	0 Units	255 gpd/unit	0
Industrial	0 Acres	25 gpd/unit @ 20 units/ac	0
Community Use: Commercial	0 Acres	25 gpd/unit @ 20 units/ac	0
Average Daily Flow Rate*			137,900 gpd

* Wastewater Flow Calculations does not include Homestead Supplemental Ag, Community Use Ag and Parks. It is assumed that these uses will not generate any wastewater.

APPENDIX D

ORDER OF MAGNITUDE COST ESTIMATES

**DHHL HONOKOWAI
ORDER OF MAGNITUDE COST ESTIMATE
FOR ALTERNATE A**

	NO IWS FOR HOMESTEAD AG (1 TO 2 ACRE LOTS)	IWS ALLOWED FOR HOMESTEAD AG (1 TO 2 ACRE LOTS)
GENERAL WORK	\$ 2,000,000	\$ 2,000,000
ROADWAY	\$ 15,900,500	\$ 15,900,500
SEWER SYSTEM	\$ 13,201,000	\$ 5,448,000
POTABLE WATER SYSTEM	\$ 13,787,300	\$ 13,787,300
NON-POTABLE R-1 WATER SYSTEM	\$ 6,600,000	\$ 6,600,000
DRAINAGE SYSTEM	\$ 9,739,000	\$ 9,739,000
LANDSCAPING	\$ 133,000	\$ 133,000
TOTAL COST	\$ 61,360,800*	\$ 53,607,800*

**DHHL HONOKOWAI
ORDER OF MAGNITUDE COST ESTIMATE
FOR ALTERNATE B**

	NO IWS FOR HOMESTEAD AG (1 TO 2 ACRE LOTS)	IWS ALLOWED FOR HOMESTEAD AG (1 TO 2 ACRE LOTS)
GENERAL WORK	\$ 2,000,000	\$ 2,000,000
ROADWAY	\$ 13,400,000	\$ 13,400,000
SEWER SYSTEM	\$ 13,603,500	\$ 5,850,500
POTABLE WATER SYSTEM	\$ 14,054,900	\$ 14,054,900
NON-POTABLE R-1 WATER SYSTEM	\$ 6,600,000	\$ 6,600,000
DRAINAGE SYSTEM	\$ 11,354,000	\$ 11,354,000
LANDSCAPING	\$ 133,000	\$ 133,000
TOTAL COST	\$ 61,145,400*	\$ 53,392,400*

*Note - cost estimate does not include electrical, telephone and cable TV systems.

**DHHL HONOKOWAI
ORDER OF MAGNITUDE COST ESTIMATE
FOR ALTERNATE C**

	NO IWS FOR HOMESTEAD AG (1 TO 2 ACRE LOTS)	IWS ALLOWED FOR HOMESTEAD AG (1 TO 2 ACRE LOTS)
GENERAL WORK	\$ 2,000,000	\$ 2,000,000
ROADWAY	\$ 13,900,500	\$ 13,900,500
SEWER SYSTEM	\$ 12,493,000	\$ 4,740,000
POTABLE WATER SYSTEM	\$ 12,899,300	\$ 12,899,300
NON-POTABLE R-1 WATER SYSTEM	\$ 6,600,000	\$ 6,600,000
DRAINAGE SYSTEM	\$ 11,407,000	\$ 11,407,000
LANDSCAPING	\$ 133,000	\$ 133,000
TOTAL COST	\$ 59,432,800*	\$ 51,679,800*

*Note - cost estimate does not include electrical, telephone and cable TV systems.

**DHHL HONOKOWAI
ORDER OF MAGNITUDE COST ESTIMATE
FOR ALTERNATE C – PHASE I**

	NO IWS FOR HOMESTEAD AG (1 TO 2 ACRE LOTS)	IWS ALLOWED FOR HOMESTEAD AG (1 TO 2 ACRE LOTS)
GENERAL WORK	\$ 645,000	\$ 645,000
ROADWAY	\$ 7,638,200	\$ 7,675,000
SEWER SYSTEM	\$ 5,247,000	\$ 2,370,000
POTABLE WATER SYSTEM	\$ 4,515,000	\$ 4,515,000
NON-POTABLE R-1 WATER SYSTEM	\$ 2,310,000	\$ 2,310,000
DRAINAGE SYSTEM	\$ 4,334,600	\$ 4,334,600
LANDSCAPING	\$ 53,200	\$ 53,200
TOTAL COST	\$ 24,743,000*	\$ 21,902,800*

*Note - cost estimate does not include electrical, telephone and cable TV systems.

**DHHL HONOKOWAI
ORDER OF MAGNITUDE COST ESTIMATE
FOR ALTERNATE C – PHASE II**

	NO IWS FOR HOMESTEAD AG (1 TO 2 ACRE LOTS)	IWS ALLOWED FOR HOMESTEAD AG (1 TO 2 ACRE LOTS)
GENERAL WORK	\$ 1,160,000	\$ 1,160,000
ROADWAY	\$ 3,150,000	\$ 3,150,000
SEWER SYSTEM	\$ 3,800,000	\$ 1,000,000
POTABLE WATER SYSTEM	\$ 3,900,000	\$ 3,900,000
NON-POTABLE R-1 WATER SYSTEM	\$ 2,150,000	\$ 2,150,000
DRAINAGE SYSTEM	\$ 4,100,000	\$ 4,100,000
LANDSCAPING	\$ 50,000	\$ 50,000
TOTAL COST	\$ 18,310,000*	\$ 15,510,000*

*Note - cost estimate does not include electrical, telephone and cable TV systems.