Welcome!

Virtual Public Informational Meeting
(6:30 pm to 8:00 pm)

Draft Environmental Assessment
Proposed Irrigation System Improvements for Central Oahu

(Agribusiness Development Corporation Recycled Water Project)

Virtual Meeting Rules

- ✓ Facilitated by John
- ✓ Audience on mute
- ✓ Questions or comments: (1) TYPE in Chat Box; (2) RAISE HAND; (3) UNMUTE during Q&A
- ✓ John will encourage equal participation
- ✓ Apologies in advance, John will limit rambling
- ✓ This meeting is being recorded

Presentation Outline

1. Draft EA – Purpose and Process
2. Alternatives – Engineering Perspective (BC)*
3. Cultural Impact Assessment & Archaeological Literature Review & Field Inspection (CSH)*
4. Biological Resources & Water Quality (AECOS)*
5. EA Next Steps
6. General Q&A

Presentation Outline

1. Draft EA – Purpose and Process
2. Alternatives – Engineering Perspective (BC)*
3. Cultural Impact Assessment & Archaeological Literature Review & Field Inspection (CSH)*
4. Biological Resources & Water Quality (AECOS)*
5. EA Next Steps
6. General Q&A

* Quick pause for Q&A

Environmental Assessment (EA) Team

Owner: Agribusiness Development Corporation

Prime Consultant: Brown and Caldwell

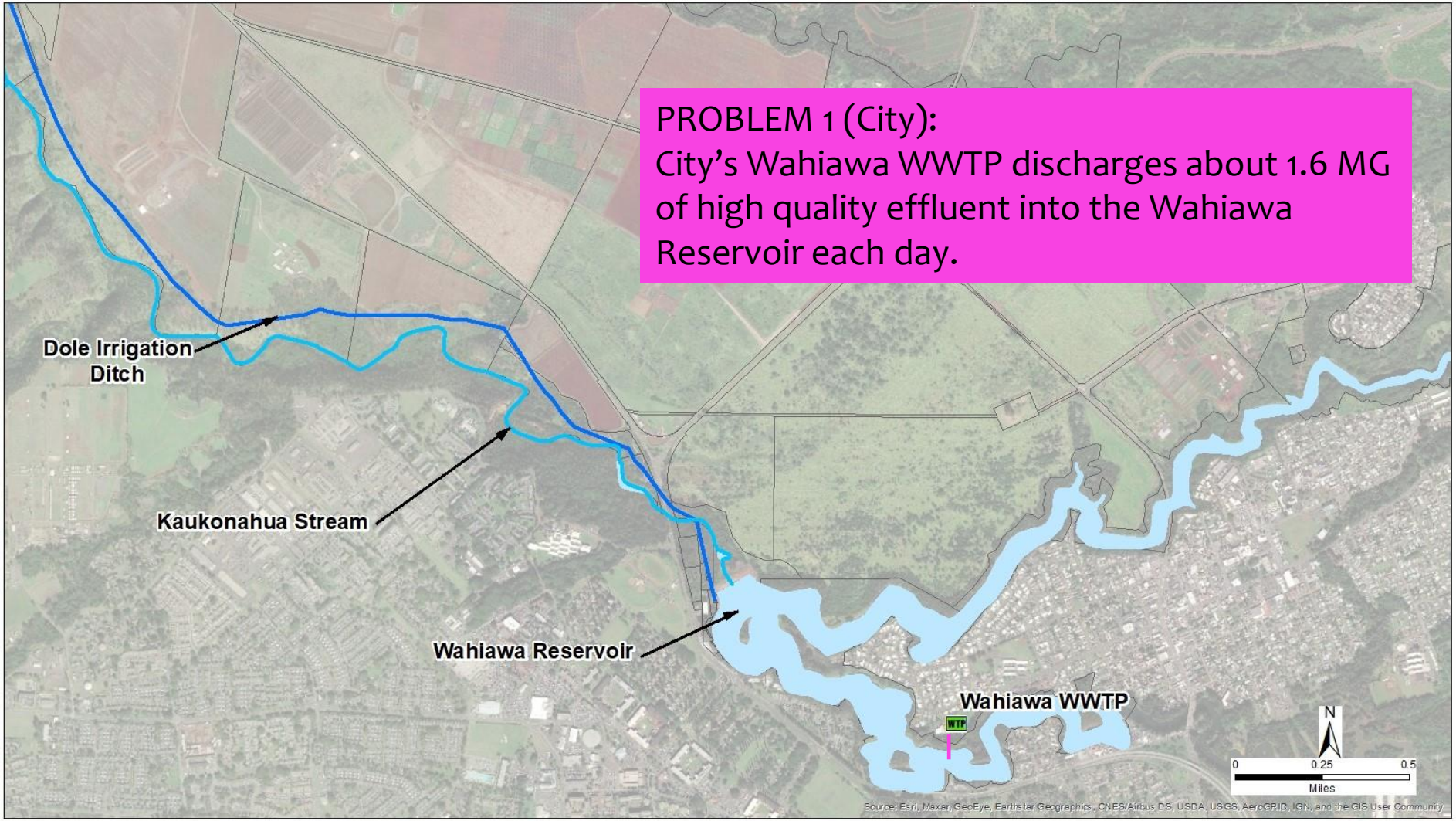
- EA Preparer: The Limtiaco Consulting Group
- EA Subconsultant: Cultural Surveys Hawaii
- EA Subconsultant: AECOS

Terminology

Lake Wilson = Wahiawa Reservoir

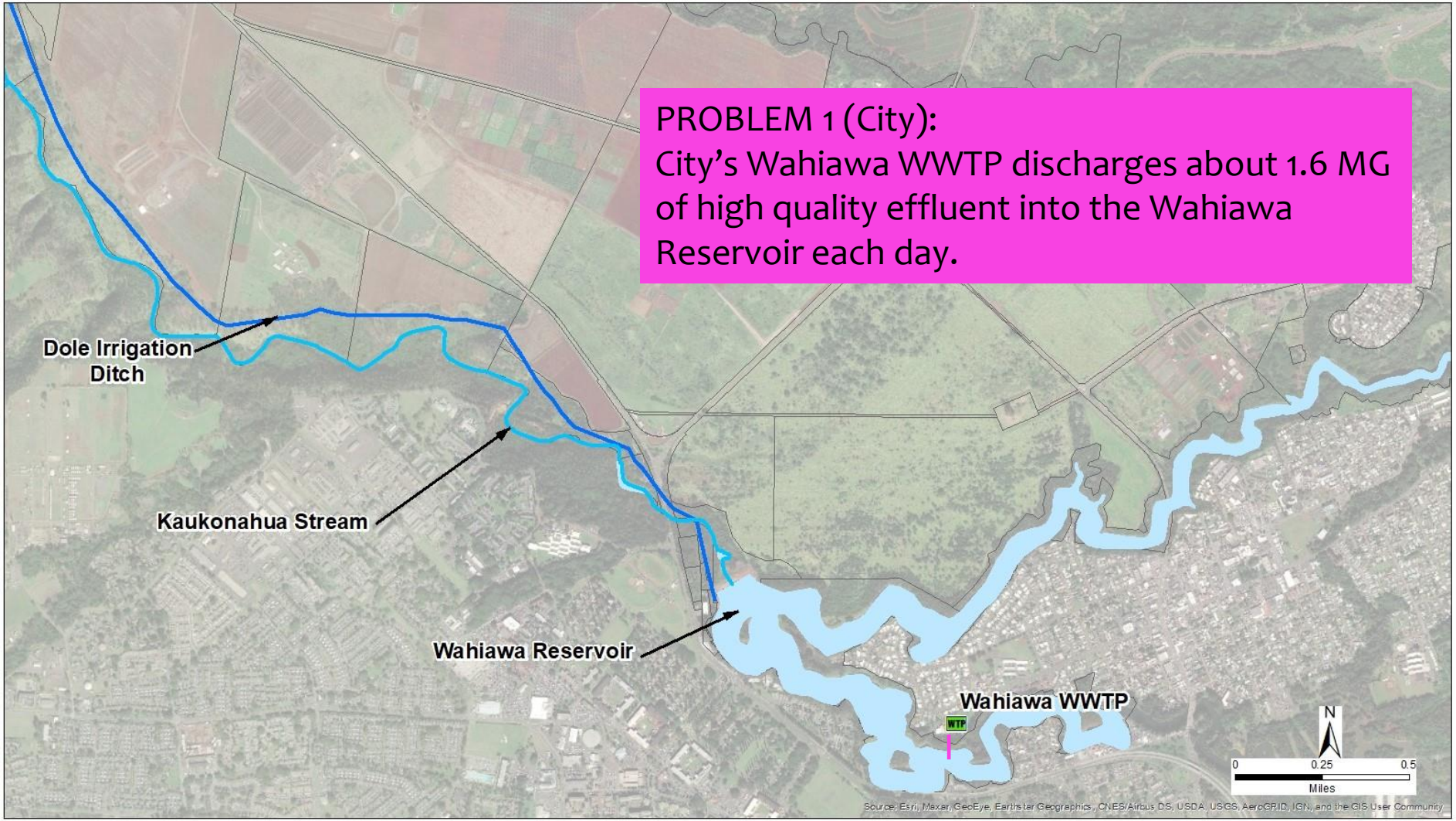
Problem Solving

Wahiawa WWTP

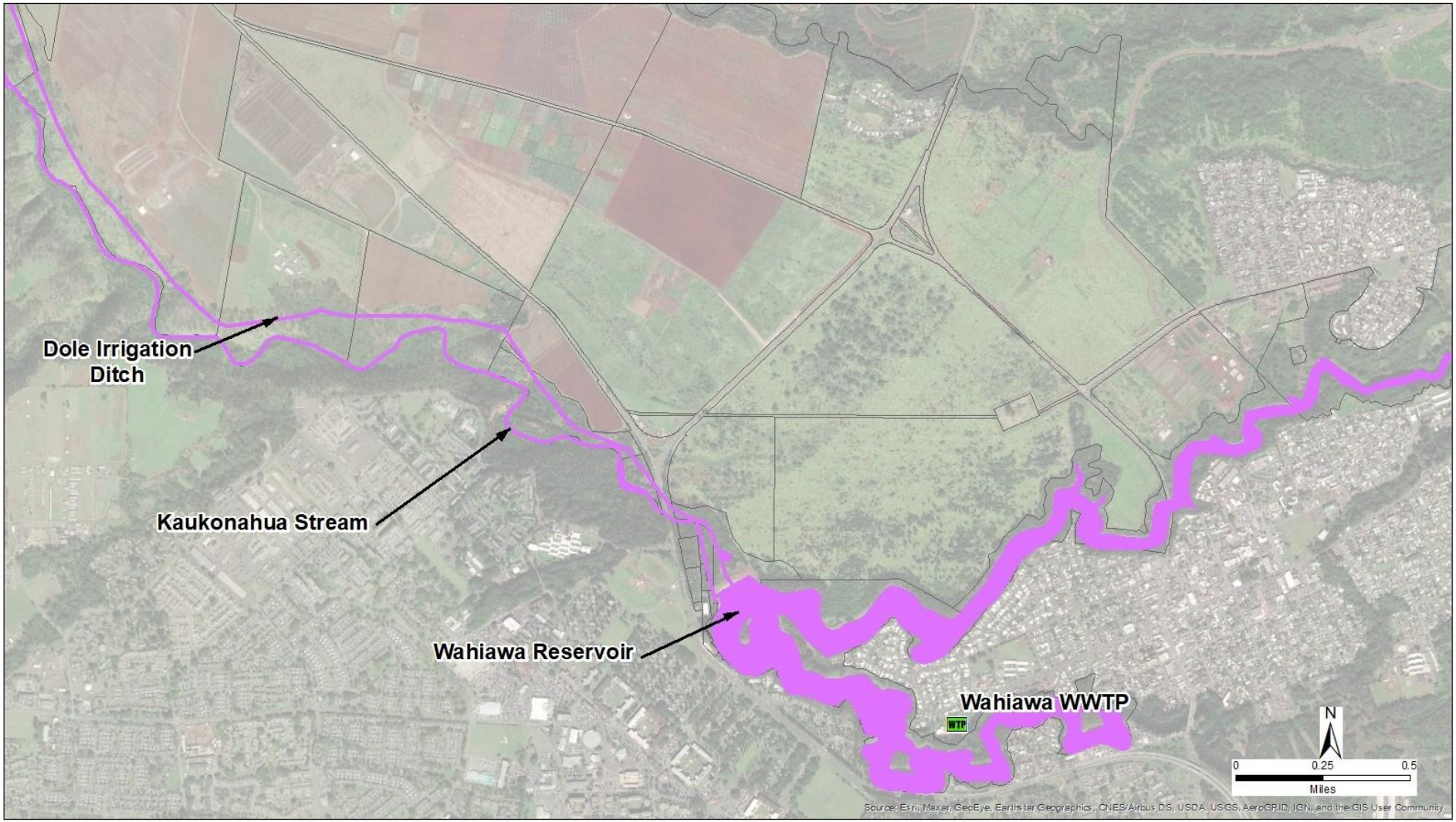


1.6 MG is equivalent to 2-1/2 Olympic Swimming Pools

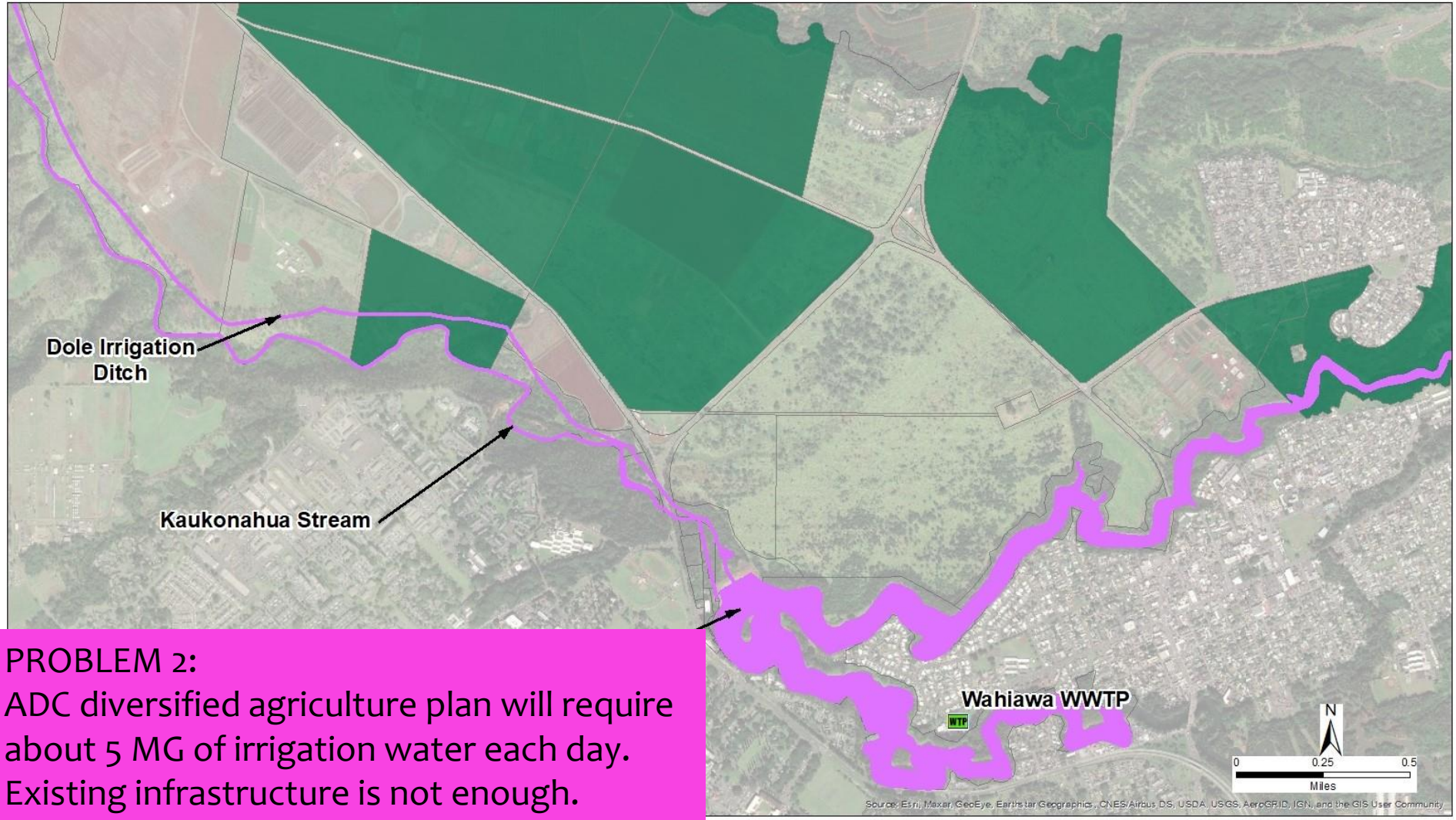
Wahiawa WWTP



Treated Wastewater Effluent in Wahiawa Reservoir = "Restricted Water"

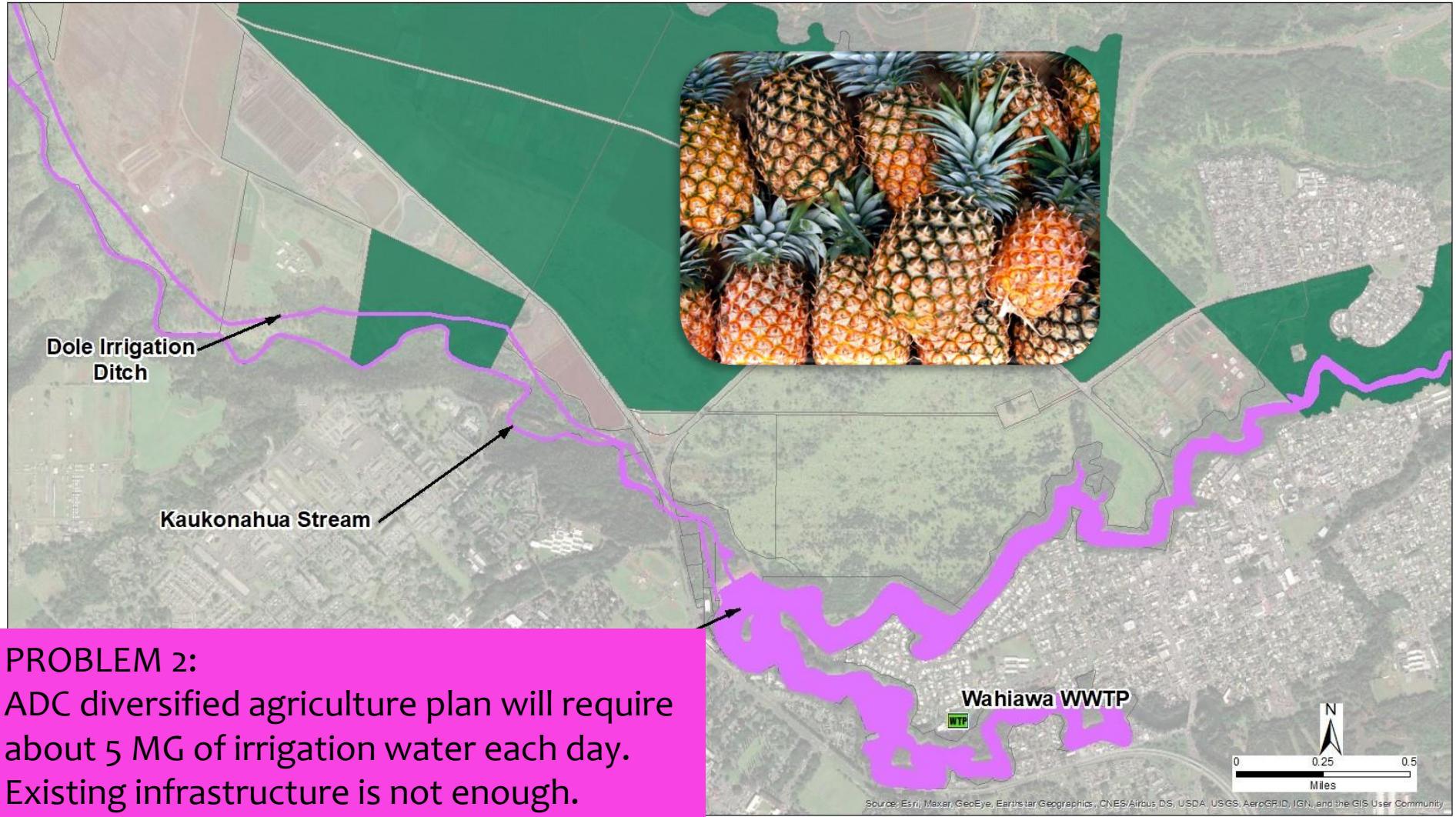


ADC Land



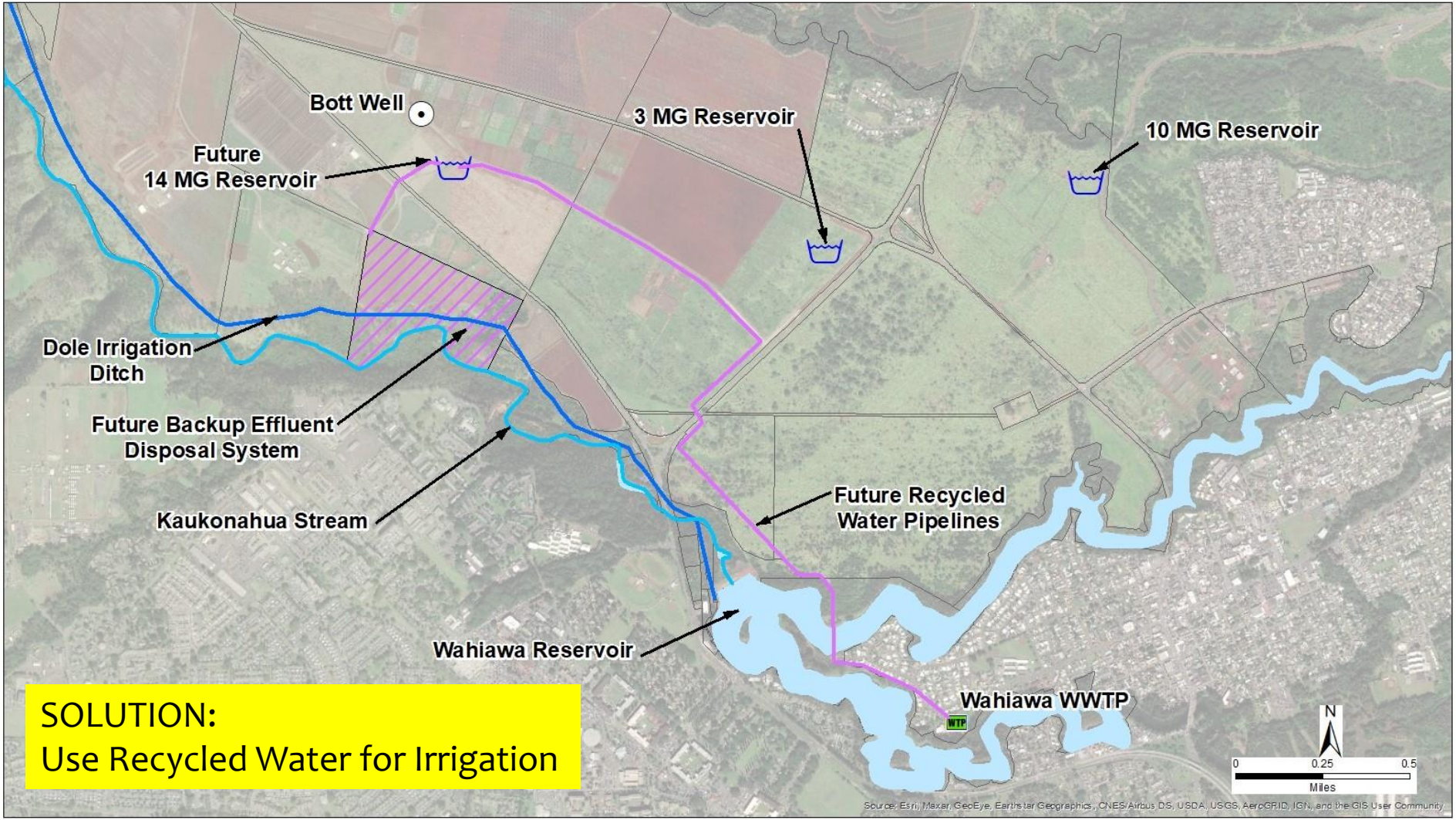
PROBLEM 2:
ADC diversified agriculture plan will require about 5 MG of irrigation water each day. Existing infrastructure is not enough.

ADC Land



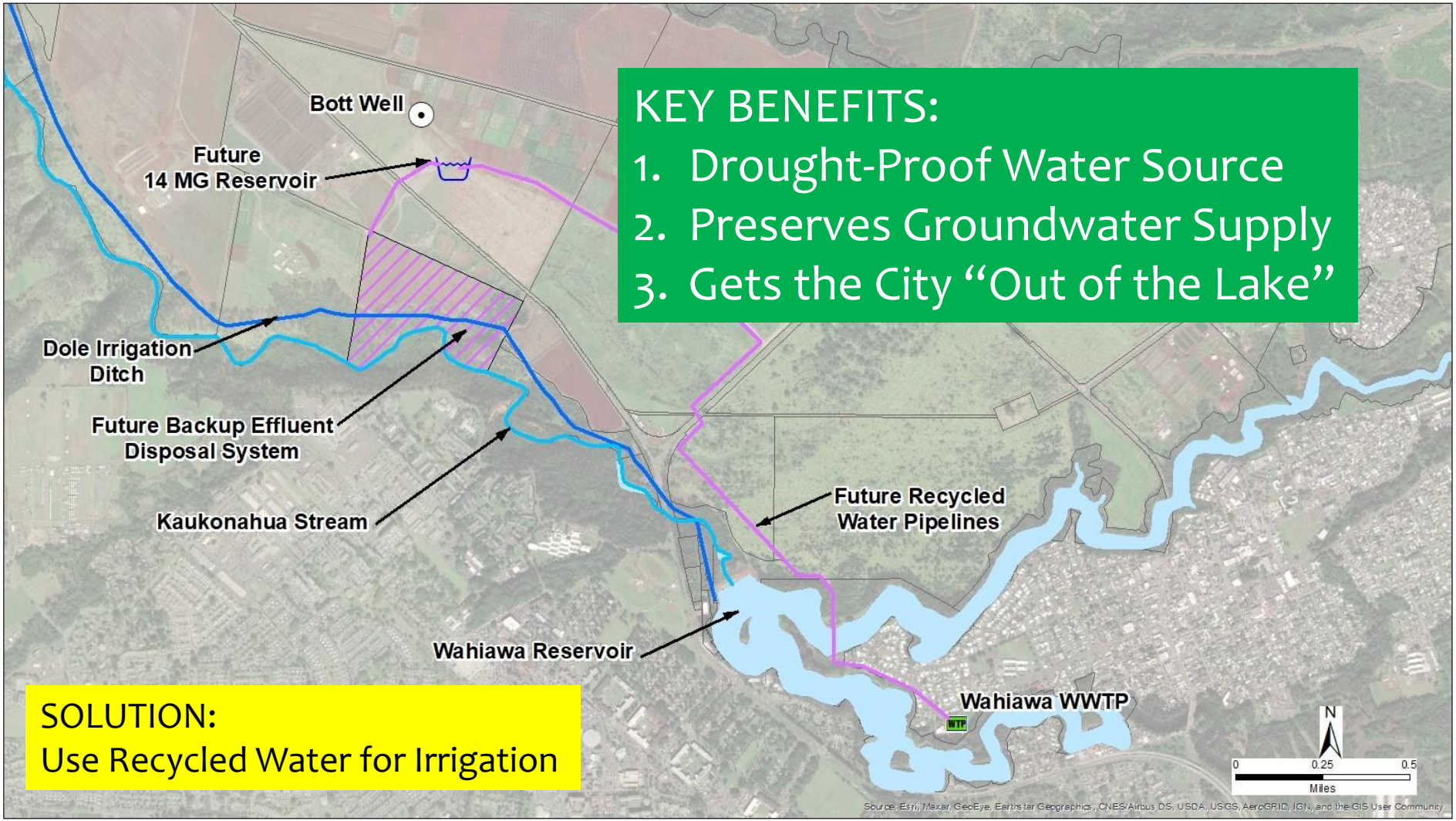
PROBLEM 2:
ADC diversified agriculture plan will require about 5 MG of irrigation water each day. Existing infrastructure is not enough.

ADC Recycled Water System



SOLUTION:
Use Recycled Water for Irrigation

ADC Recycled Water System

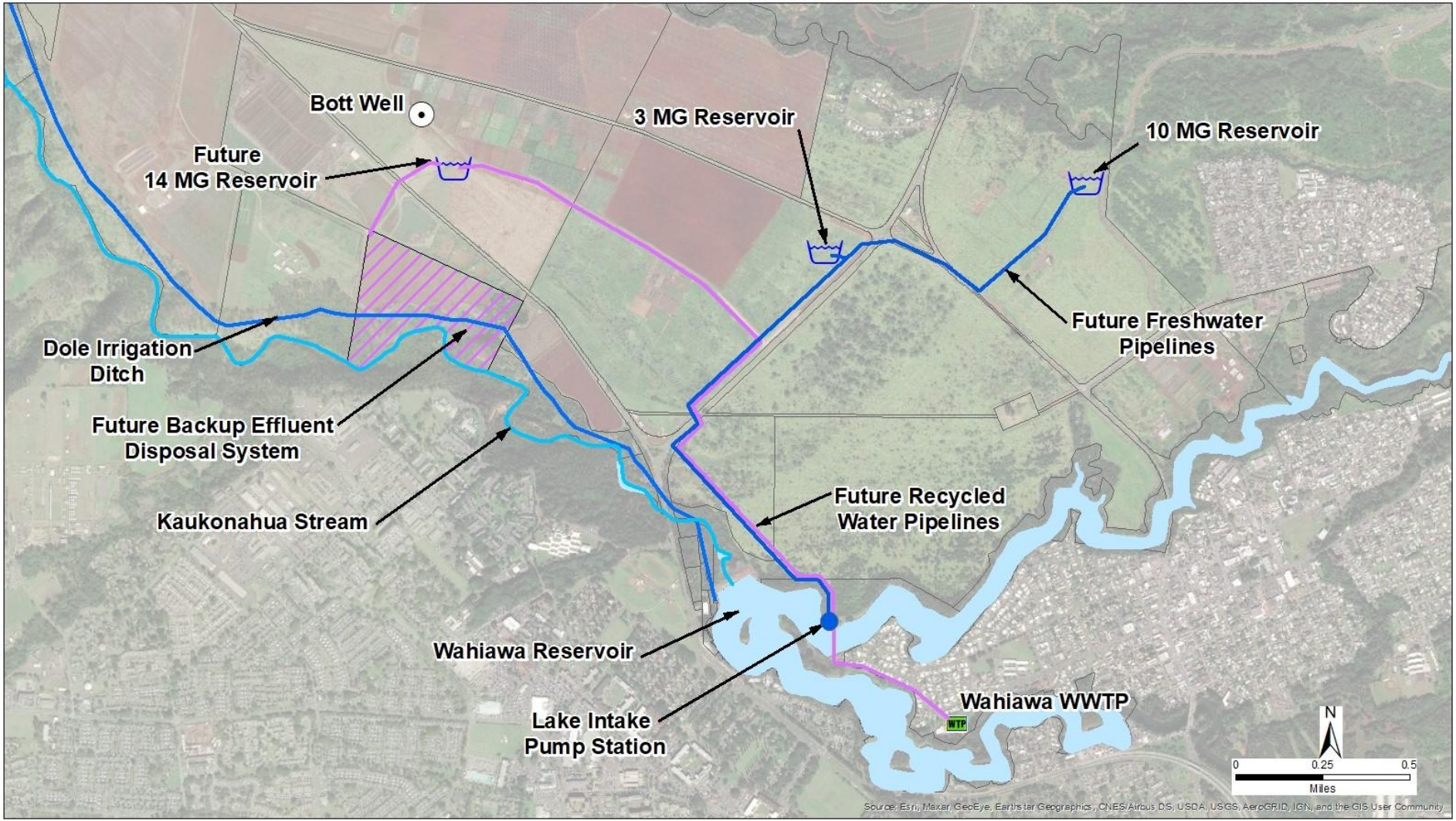


KEY BENEFITS:

1. Drought-Proof Water Source
2. Preserves Groundwater Supply
3. Gets the City "Out of the Lake"

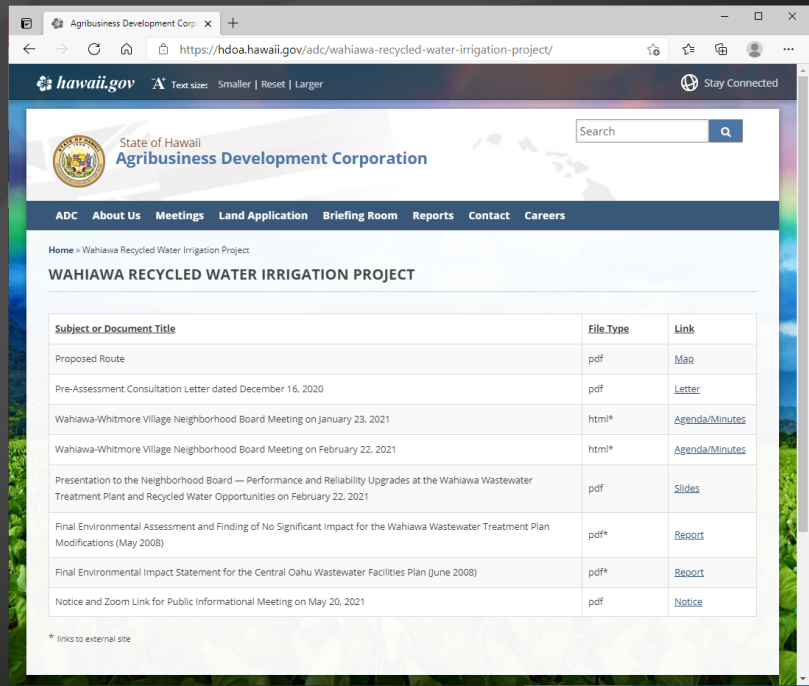
SOLUTION:
Use Recycled Water for Irrigation

ADC Recycled + Lake Water



Environmental Assessment – Purpose and Process

1. Draft EA Publication in June 2021 by OEQC
2. Additional link on ADC's website (https://hdoa.hawaii.gov/adc/wahiawa-recycled-water-irrigation-project/)
3. 30-day review period



Subject or Document Title	File Type	Link
Proposed Route	pdf	Map
Pre-Assessment Consultation Letter dated December 16, 2020	pdf	Letter
Wahiawa-Whitmore Village Neighborhood Board Meeting on January 23, 2021	html*	Agenda/Minutes
Wahiawa-Whitmore Village Neighborhood Board Meeting on February 22, 2021	html*	Agenda/Minutes
Presentation to the Neighborhood Board — Performance and Reliability Upgrades at the Wahiawa Wastewater Treatment Plant and Recycled Water Opportunities on February 22, 2021	pdf	Slides
Final Environmental Assessment and Finding of No Significant Impact for the Wahiawa Wastewater Treatment Plan Modifications (May 2008)	pdf*	Report
Final Environmental Impact Statement for the Central Oahu Wastewater Facilities Plan (June 2008)	pdf*	Report
Notice and Zoom Link for Public Informational Meeting on May 20, 2021	pdf	Notice

Presentation Outline

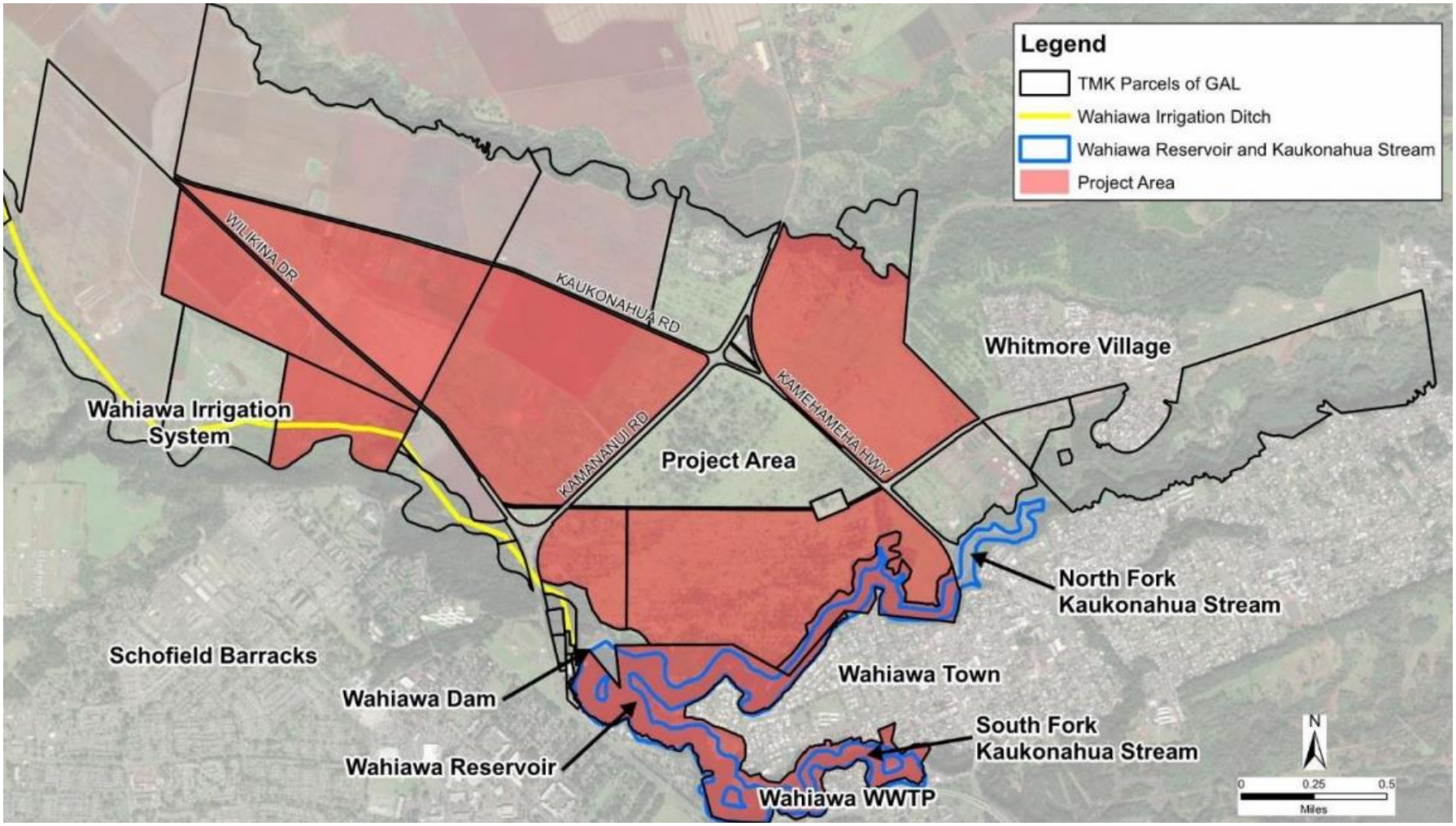
1. Draft EA – Purpose and Process
2. Alternatives – Engineering Perspective (BC)*
3. Cultural Impact Assessment & Archaeological Literature Review & Field Inspection (CSH)*
4. Biological Resources & Water Quality (AECOS)*
5. EA Next Steps
6. General Q&A

Brown AND Caldwell

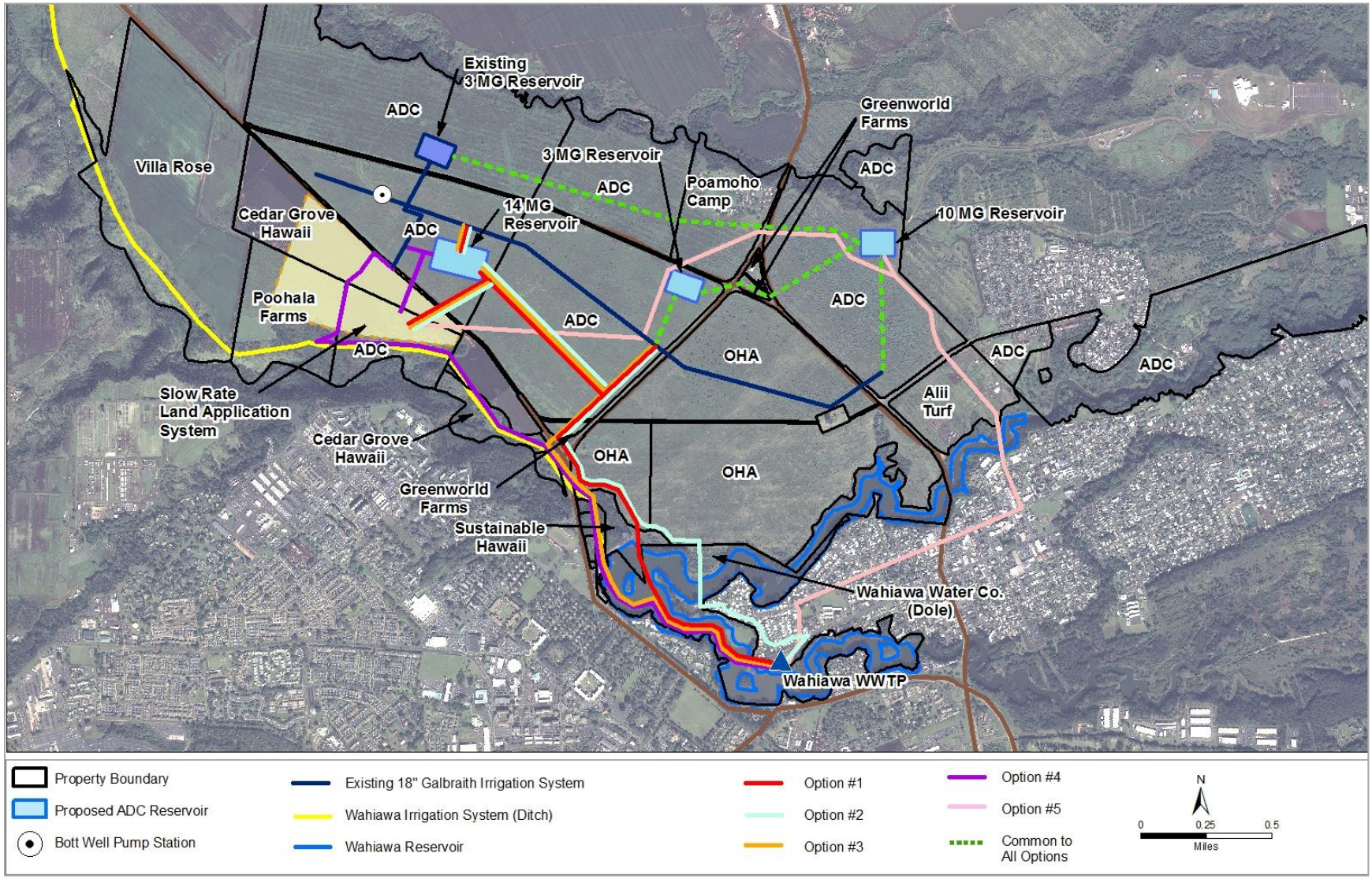
Proposed Irrigation System Improvements for Central Oahu

May 20, 2021

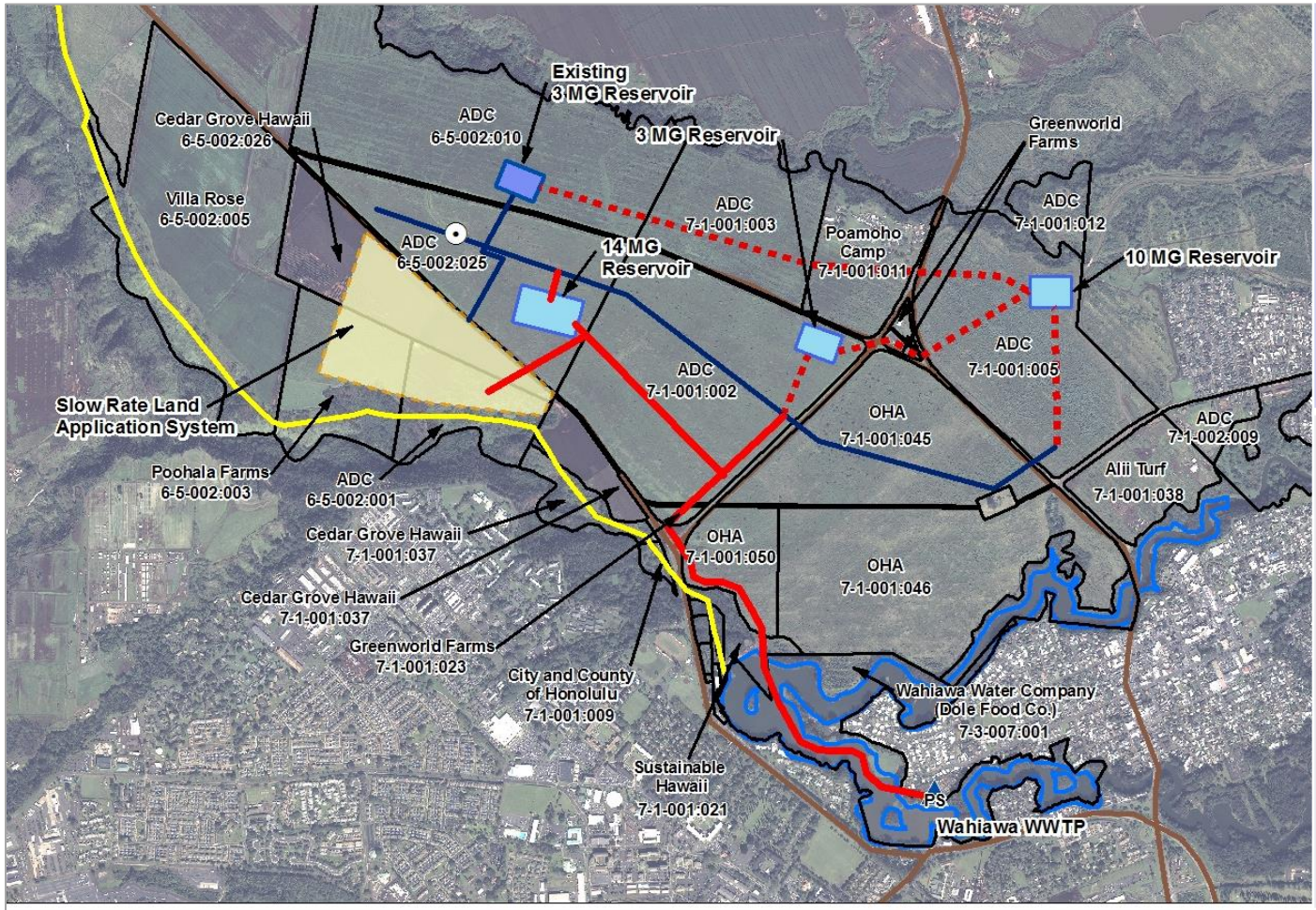
Project Site Location



Routing Study



Routing Study – Option #1



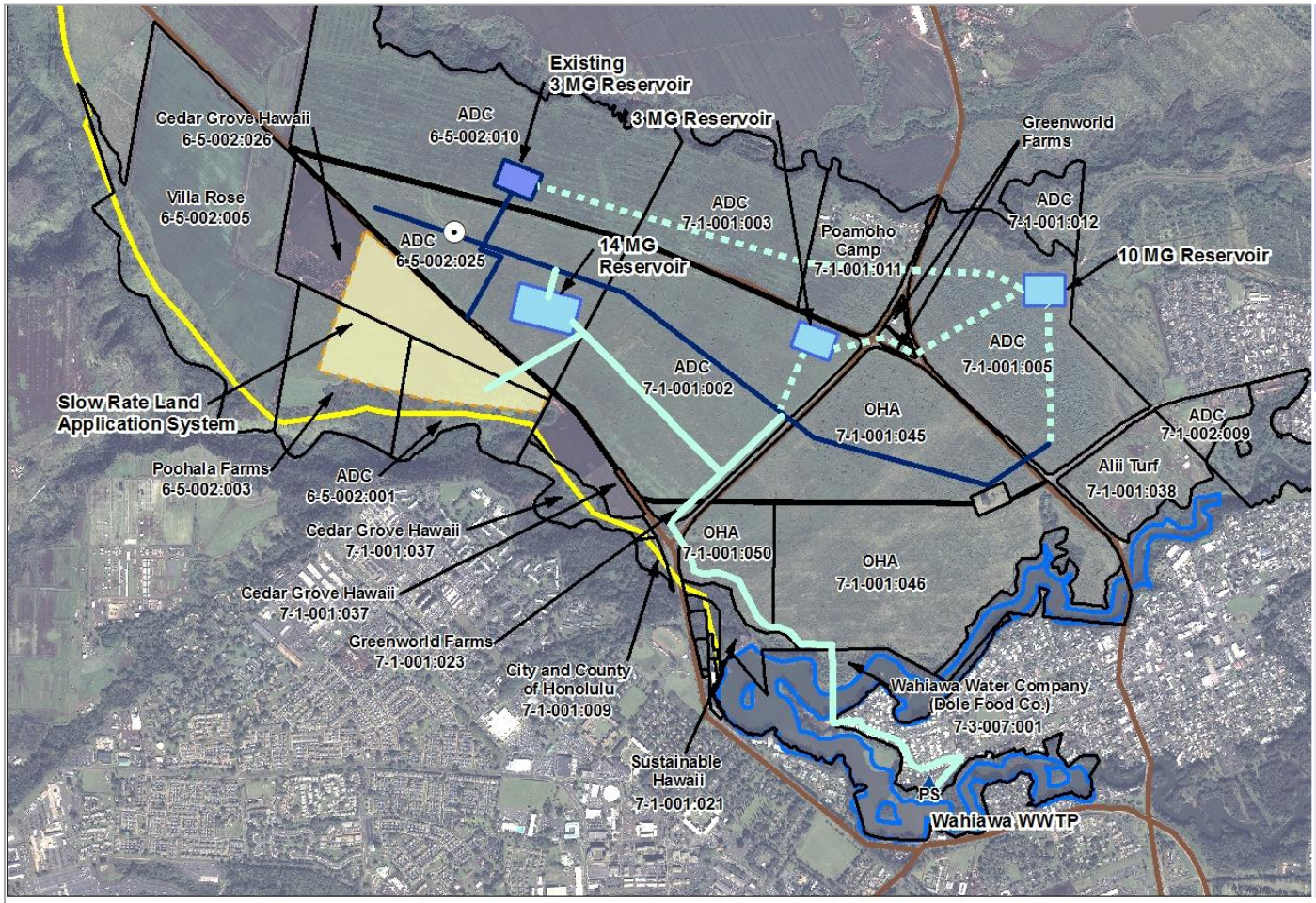
Advantages

- Direct route
- Fewer easements

Disadvantages

- Long route within reservoir
- More permits
- Near dam spillway

Routing Study – Option #2



Advantages

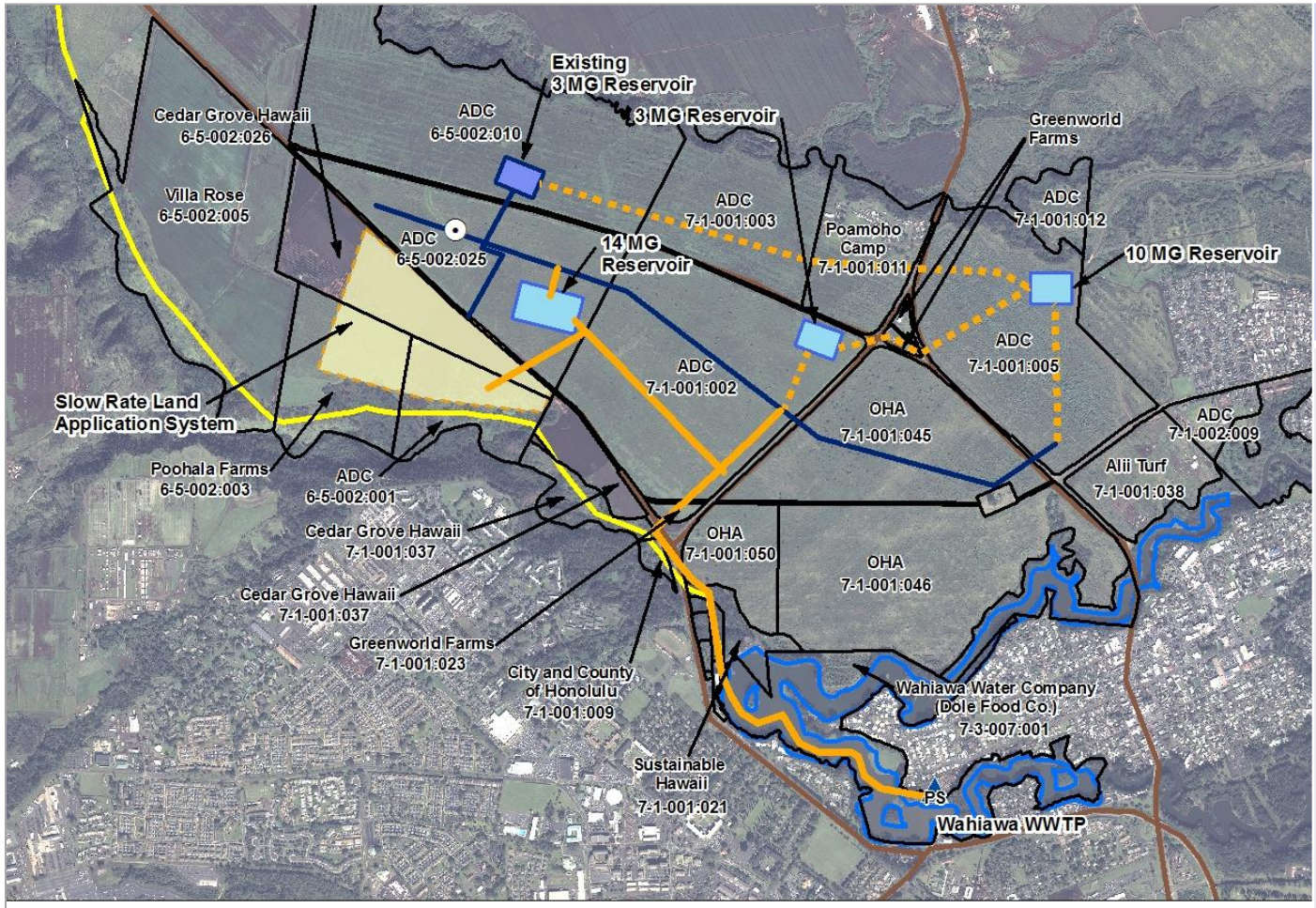
- Direct route
- Fewer easements
- Minimal length of pipe in reservoir

Disadvantages

- Pipes located within moderate traffic roadway near WWTP
- Utility easement in City ROW

Property Boundary
Proposed ADC Reservoir
Bott Well Pump Station
Existing 18" Galbraith Irrigation System
Wahiawa Irrigation System (Ditch)
Wahiawa Reservoir
Option #2
Approx Location of the Slow Rate Land Application System (SRLAS)
N
0 0.25 0.5
Miles

Routing Study – Option #3



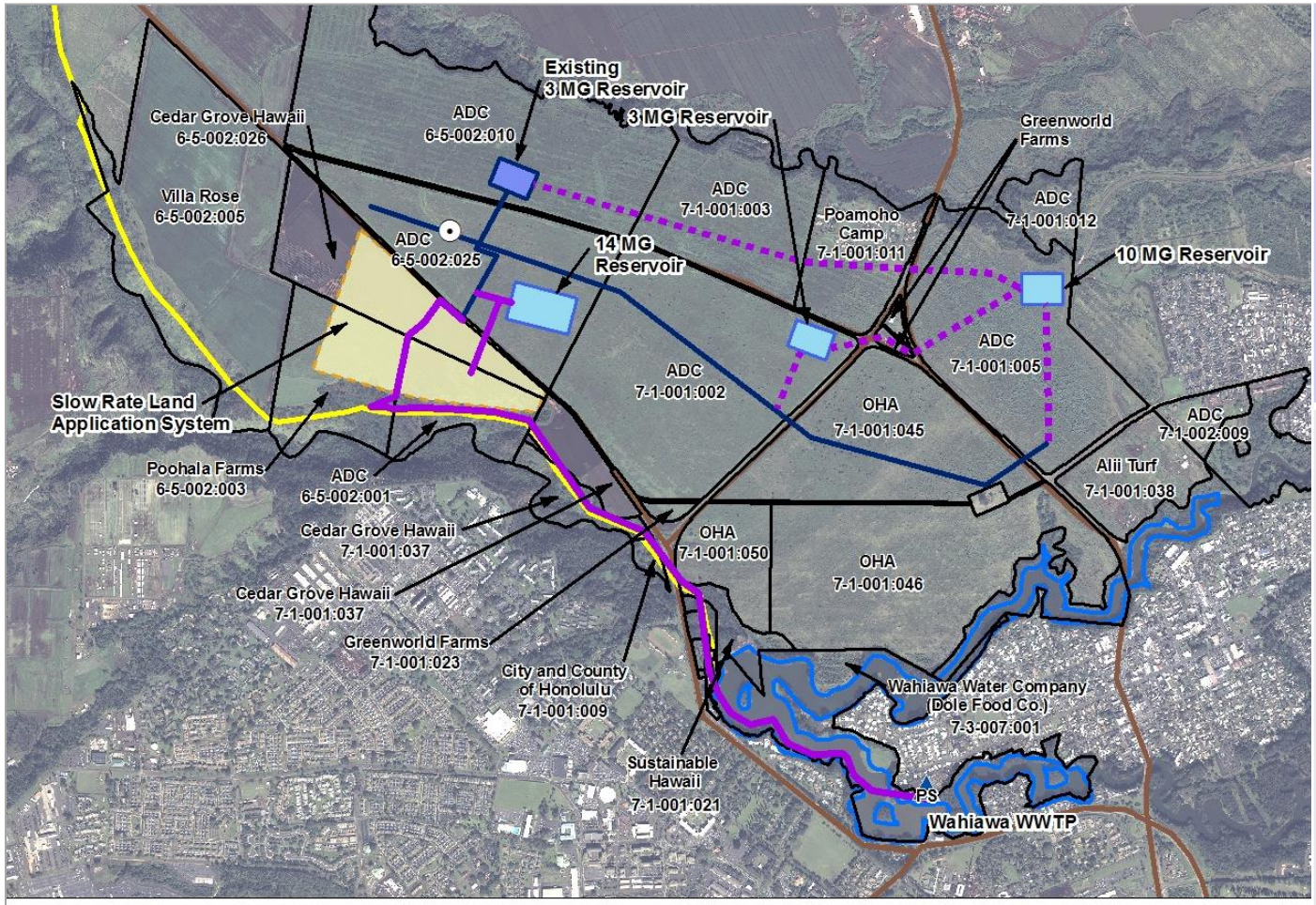
Advantages

- Direct route
- No construction in high-traffic roadways

Disadvantages

- Long route within reservoir
- More permits
- Near dam spillway
- Constructability issues downstream of dam

Routing Study – Option #4



Property Boundary
Proposed ADC Reservoir
Bott Well Pump Station
Existing 18" Galbraith Irrigation System
Wahiawa Irrigation System (Ditch)
Wahiawa Reservoir
Option #4
Approx Location of the
Slow Rate Land Application System (SRLAS)
N
0 0.25 0.5
Miles

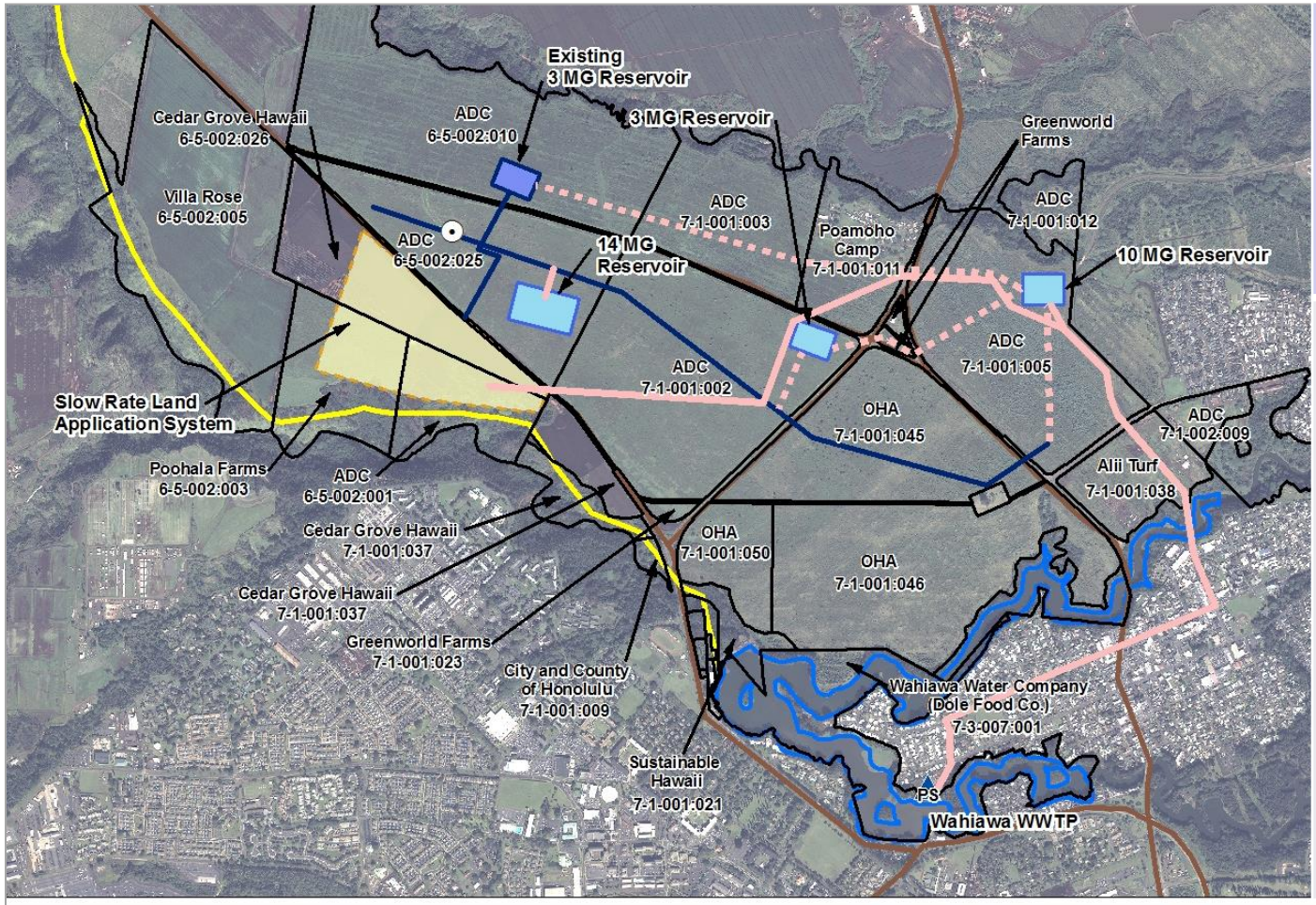
Advantages

- No construction in high-traffic roadways
- Follows existing Wahiawa Irrigation System

Disadvantages

- Long route within reservoir
- More permits
- Near dam spillway
- Constructability concerns downstream of dam

Routing Study – Option #5



Advantages

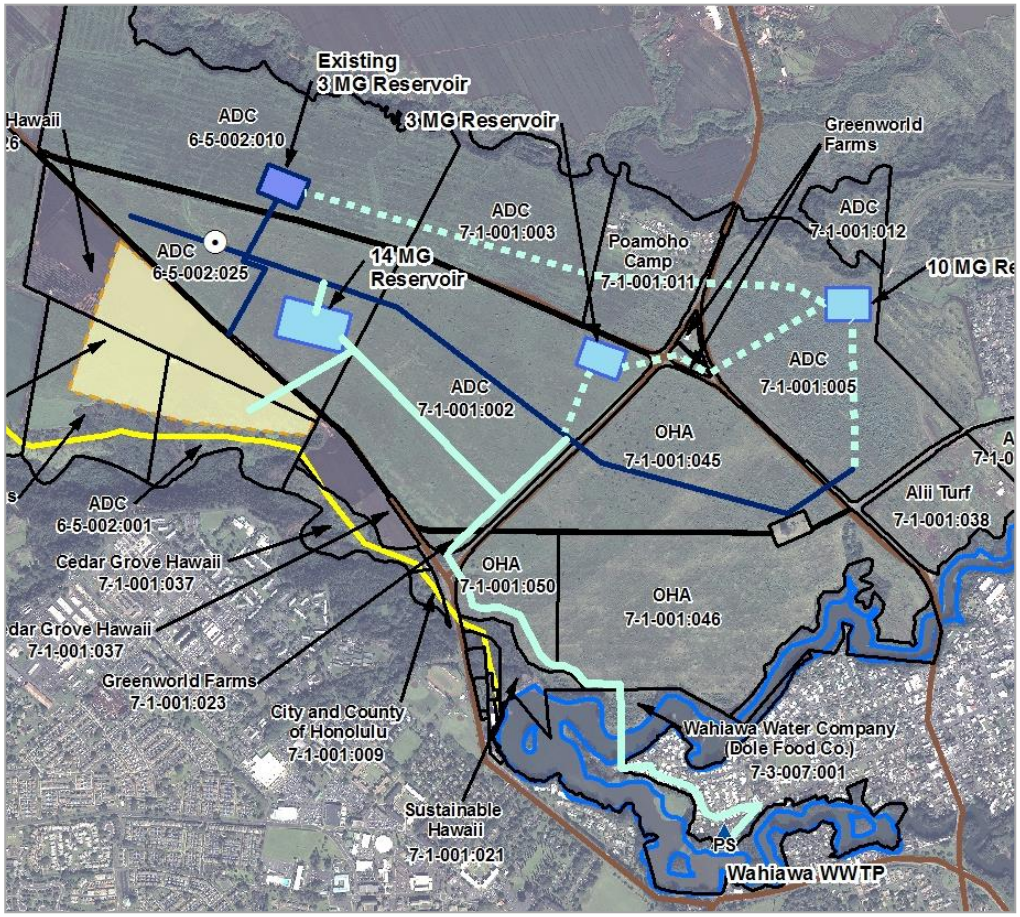
- Minimal length of pipe crossing reservoir/stream

Disadvantages

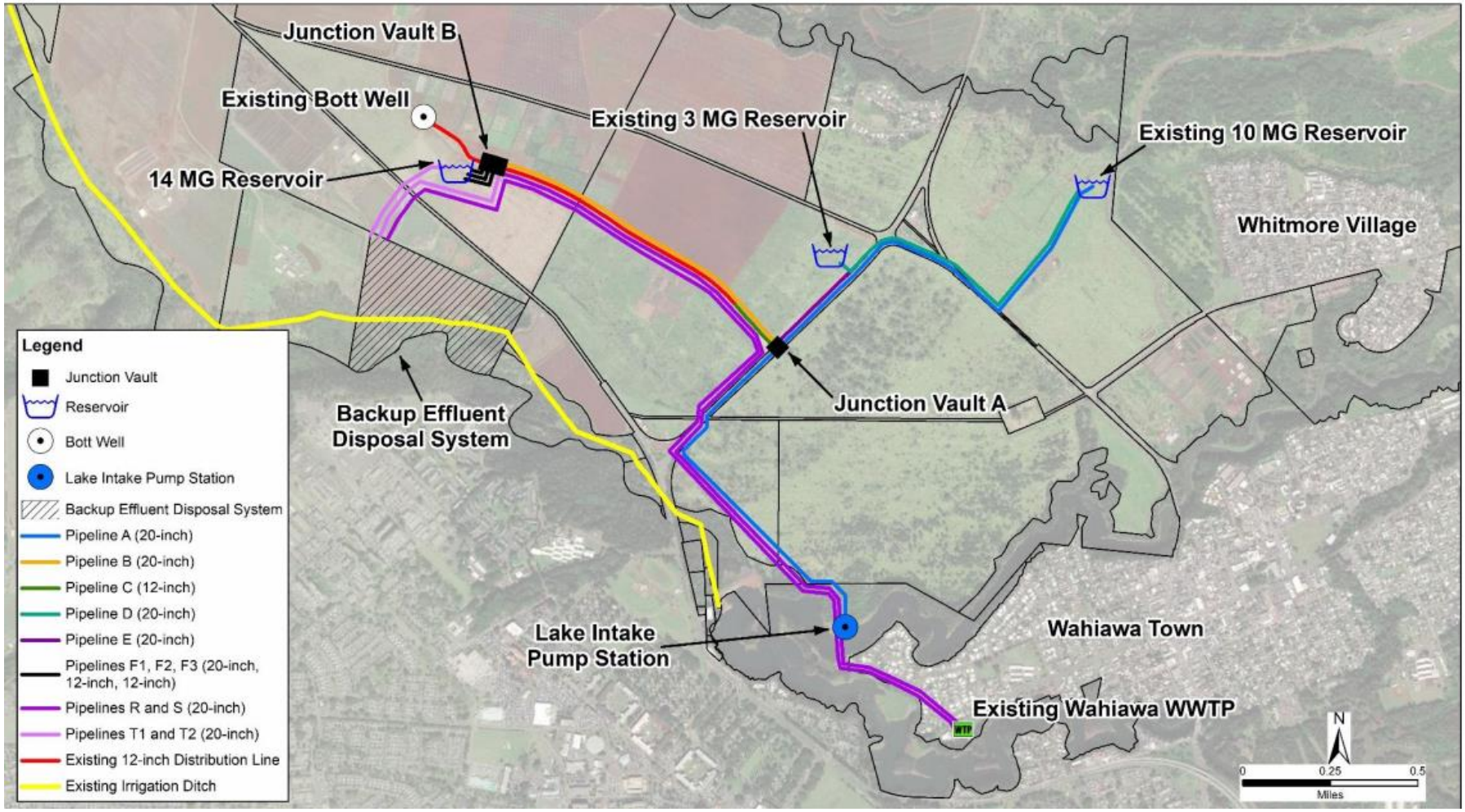
- Longest length of total pipeline
- Pipeline installed in high-traffic roadways
- Utility easement in City ROW
- Steep terrain crossing the reservoir/stream

Selected Route: Option #2

- Shorter crossing of Wahiawa Reservoir
- Avoids area near Wahiawa Dam
  - Avoids potential issues with DLNR Dam Safety by avoiding the area near the spillway
  - Avoids existing power lines near the dam
- Avoid crossing of steep slopes downstream of Wahiawa Dam
- Shorter length of pipeline in the City ROW



Overall Project Site Plan



Existing Facilities – Bott Well

Bott Well site

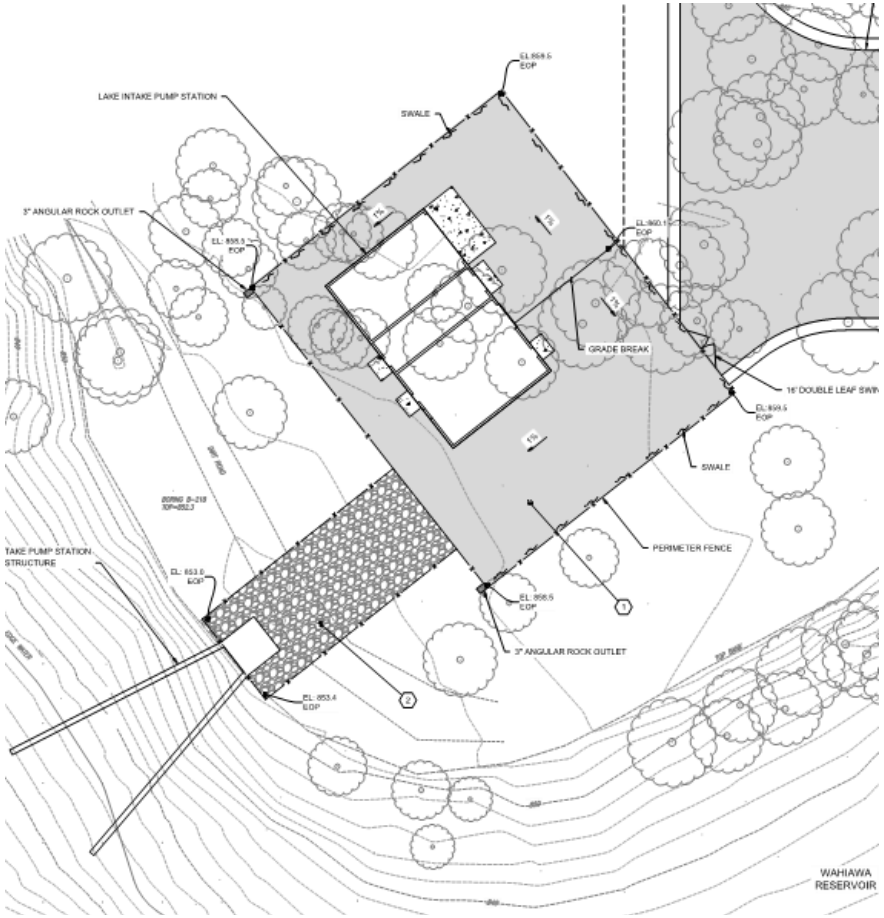
Bott Well – pump and diesel engine

Existing Facilities – 3 MG Reservoir

Existing Facilities – 10 MG Reservoir

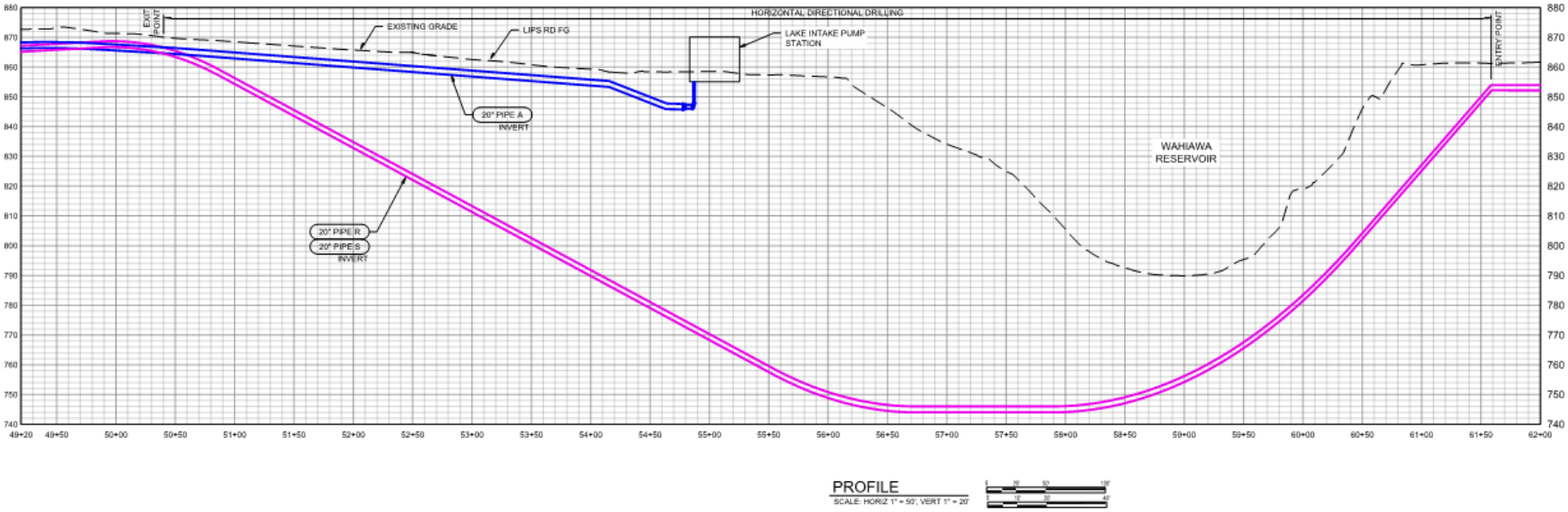
Lake Intake Pump Station

Plan View



Looking North Across the Reservoir

Wahiawa Reservoir Pipeline Crossing



Wahiawa Reservoir Pipeline Crossing

HDD Drill Shaft Example Photos

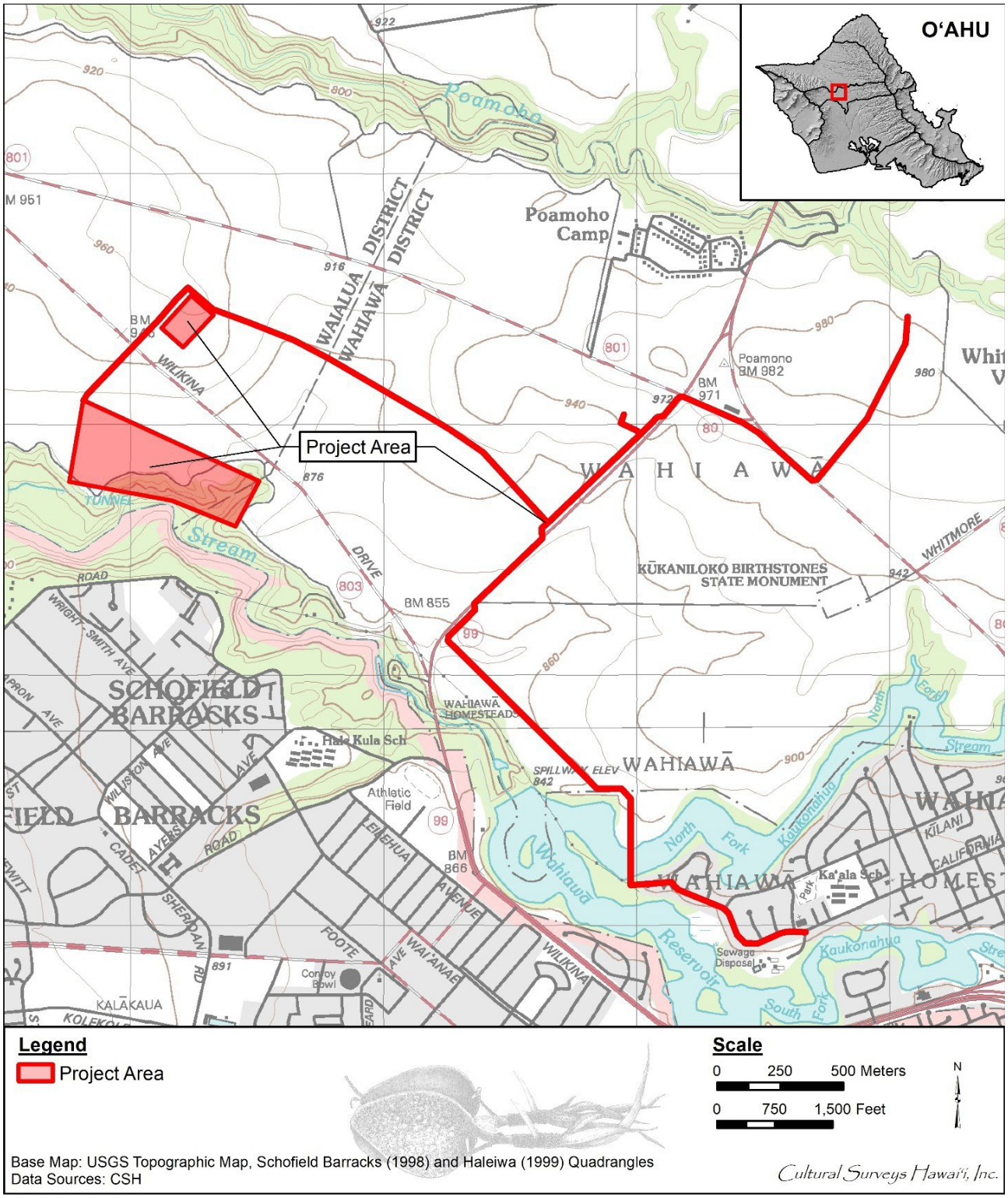
Irrigation Supply

Supply Source	Flow
Existing: Bott Well*	2.0 mgd
Future: Wahiawa WWTP recycled water	1.6 mgd
Future: Lake Intake Pump Station	5.1 mgd

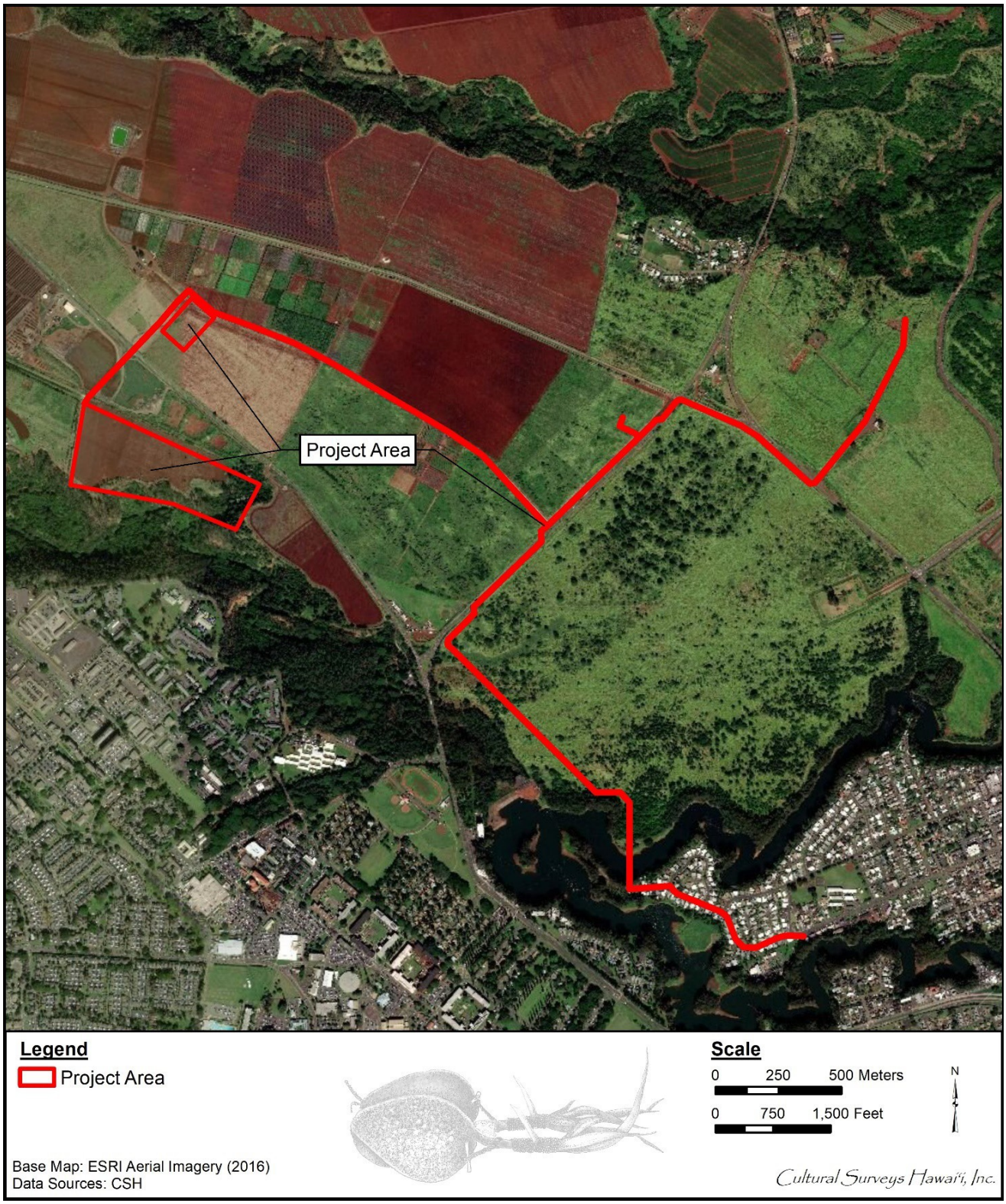
*In the future, the Bott Well will be used as a backup source of water rather than the primary source

Thank you.
Questions?

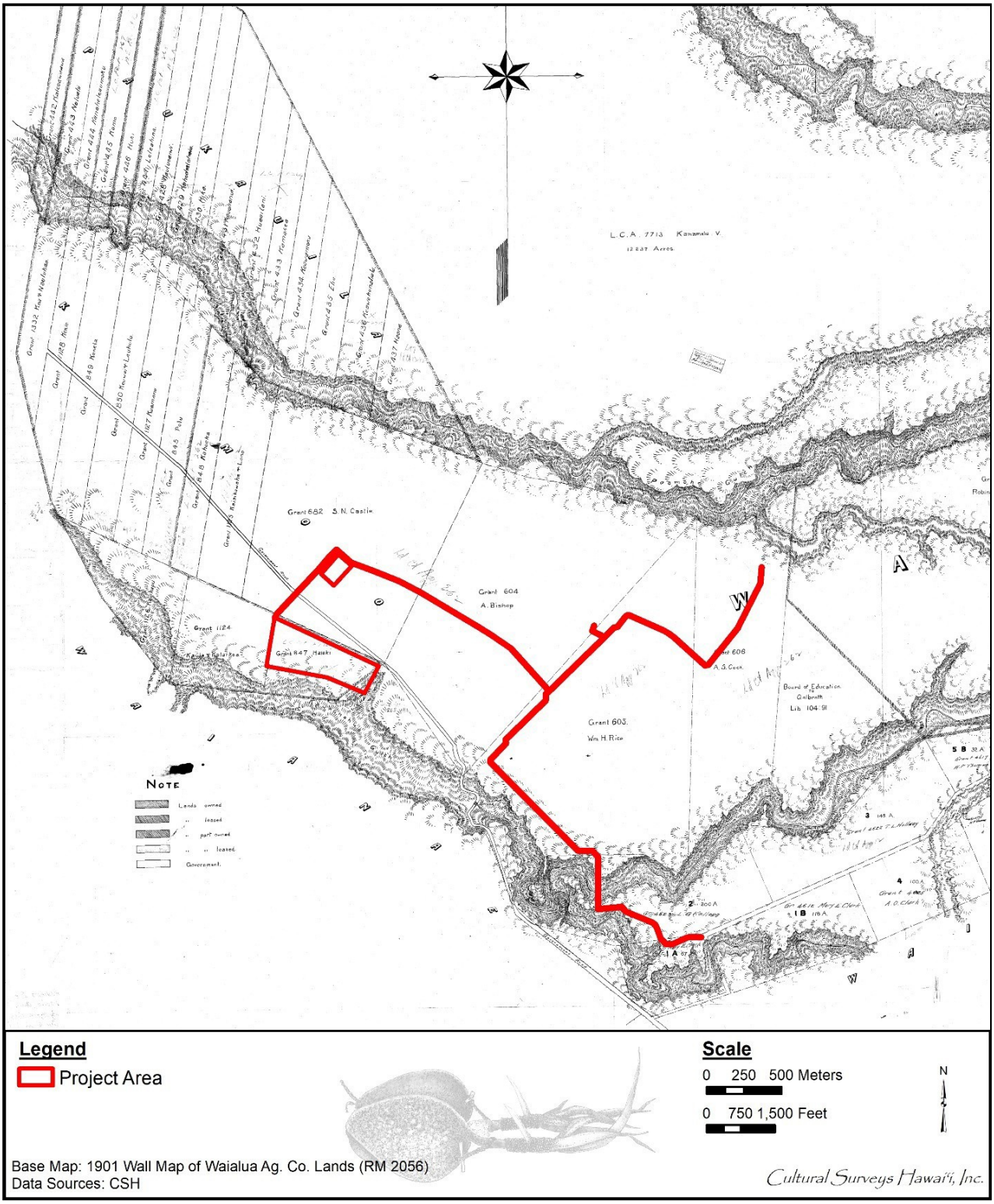
Brown AND Caldwell



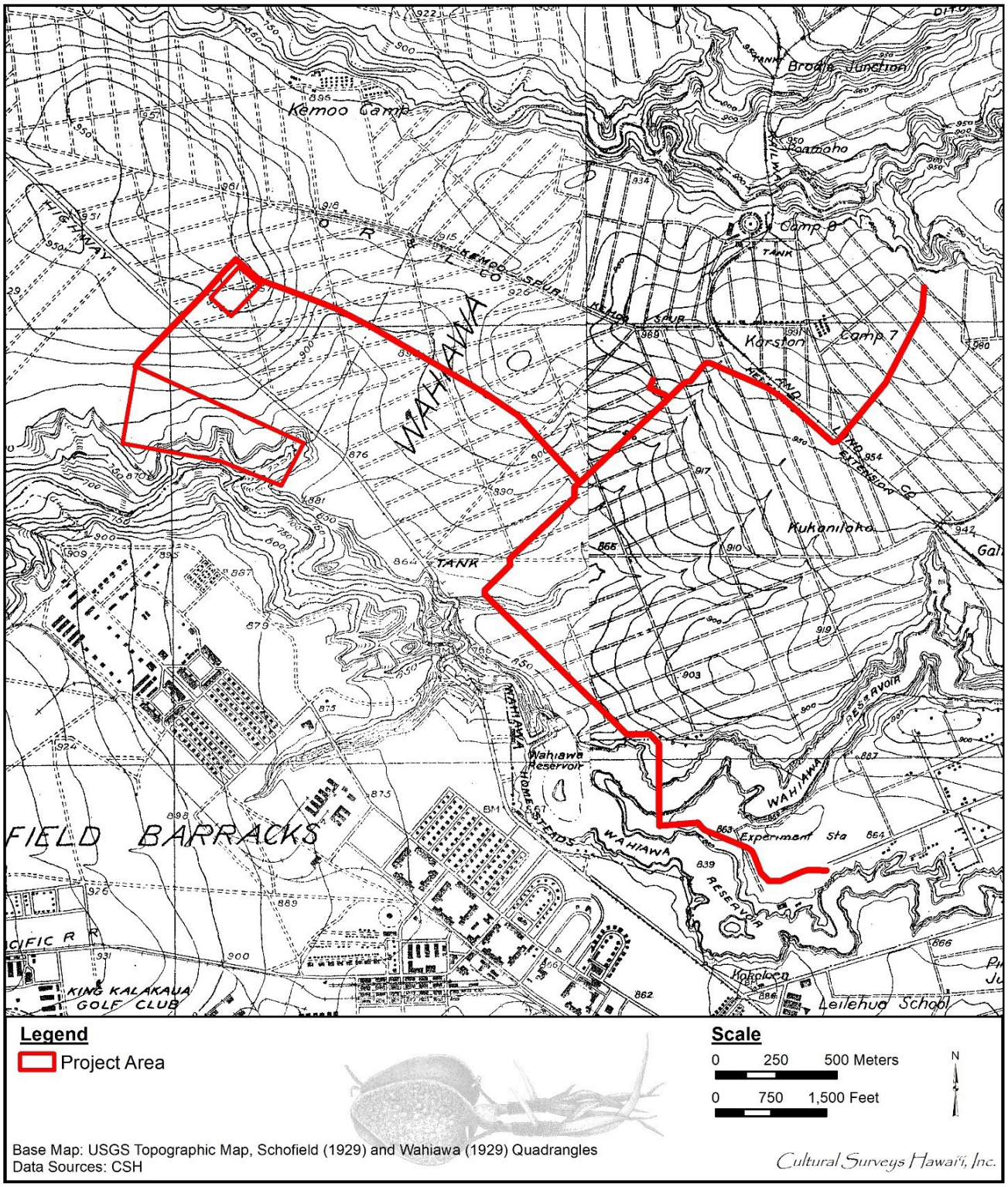
Portions of the 1998 Schofield Barracks and 1999 Haleiwa USGS 7.5-minute topographic quadrangles, showing the project area



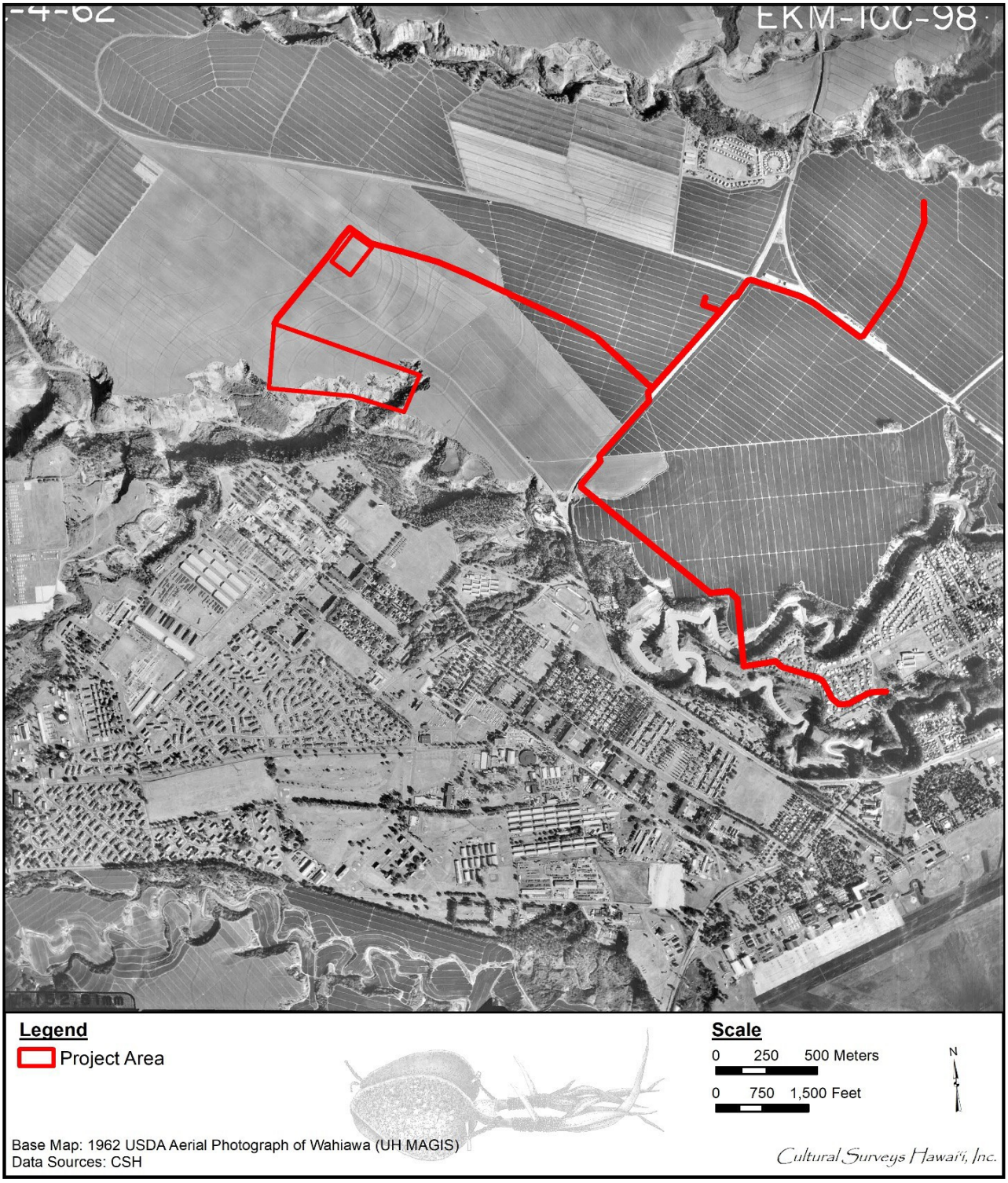
Aerial photograph, showing the project area (ESRI 2016)



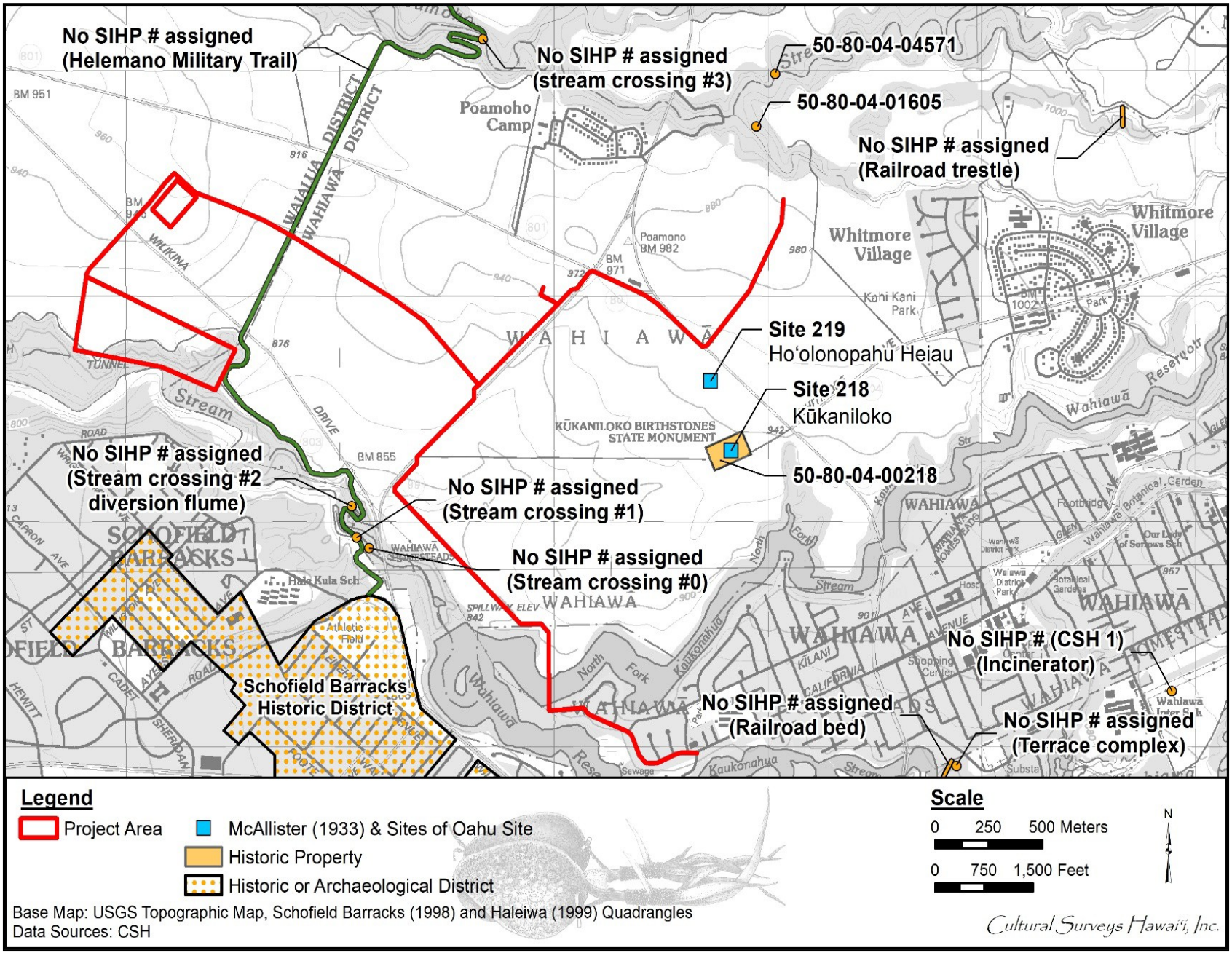
1901 Waialua Agricultural Company, Ltd., map (portion) by W.A. Wall (RM 2056), showing essentially the entire project area



Portion of 1929 Schofield and Wahiawa USGS topographic quadrangles showing the project area



1962 USDA aerial photograph of Wahiawa (UH MAGIS) showing the project area



Previously identified historic properties near the project area (base map: portions of the 1998 Schofield Barracks and 1999 Haleiwa USGS 7.5-minute topographic quadrangles)

Wahiawā Town in 1943 (City and County of Honolulu Images)

Corner of Kamehameha Highway and Avocado Avenue, with Tom's grocery store to the right, and Hi-Way Tavern visible in the background (1944)

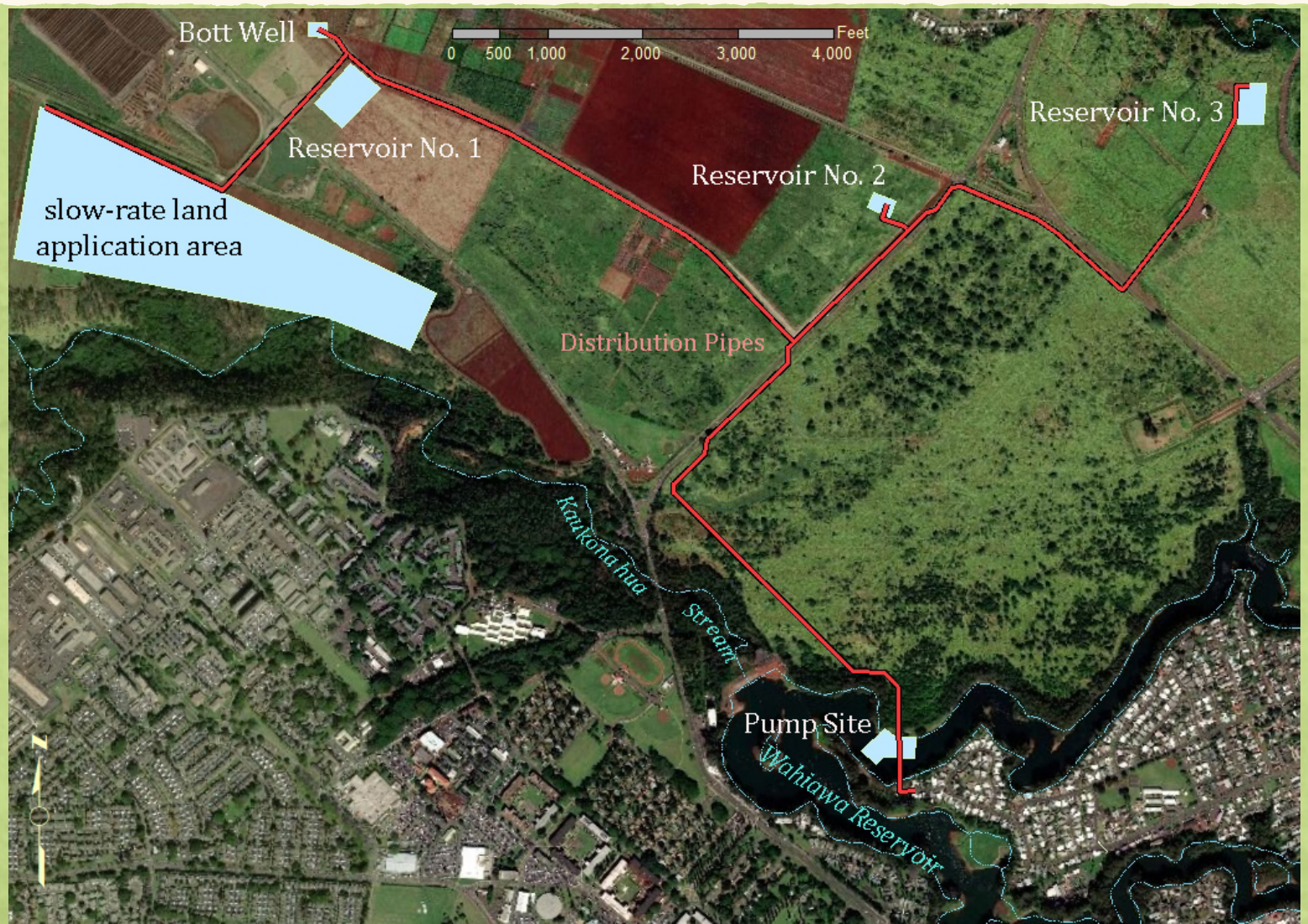
Natural Resources Assessment

Proposed irrigation system improvements for Central O‘ahu
(Agribusiness Development Corporation recycled water project)
May 2021

AECOS 50 YEARS
Dr. S. A. Cattell
Eric Guinther

Biological resources survey areas

- Plants
- Aquatic animals
- Birds
- Mammals



- Endangered species
- Jurisdictional waters
- Critical habitat

Resources/environments/habitats

New reservoir No. 3

Slow-rate application area

Wahiawā Reservoir (Lake Wilson) and Kaukonahua Stream

Wahiawā Public Fishing Area

Stocked with sportfishes

- Largemouth bass
- Tucunare
- Channel catfish

Organisms in Kaukonahua Stream include:

Armored catfishes

Channel catfish

Freshwater sponge

Avoid or minimize impacts to biota

Photo credit: USDA NRCS – en.wiki

*ae*ʻo (endangered)

*ōpe*ʻ*ape*ʻ*a* (endangered)

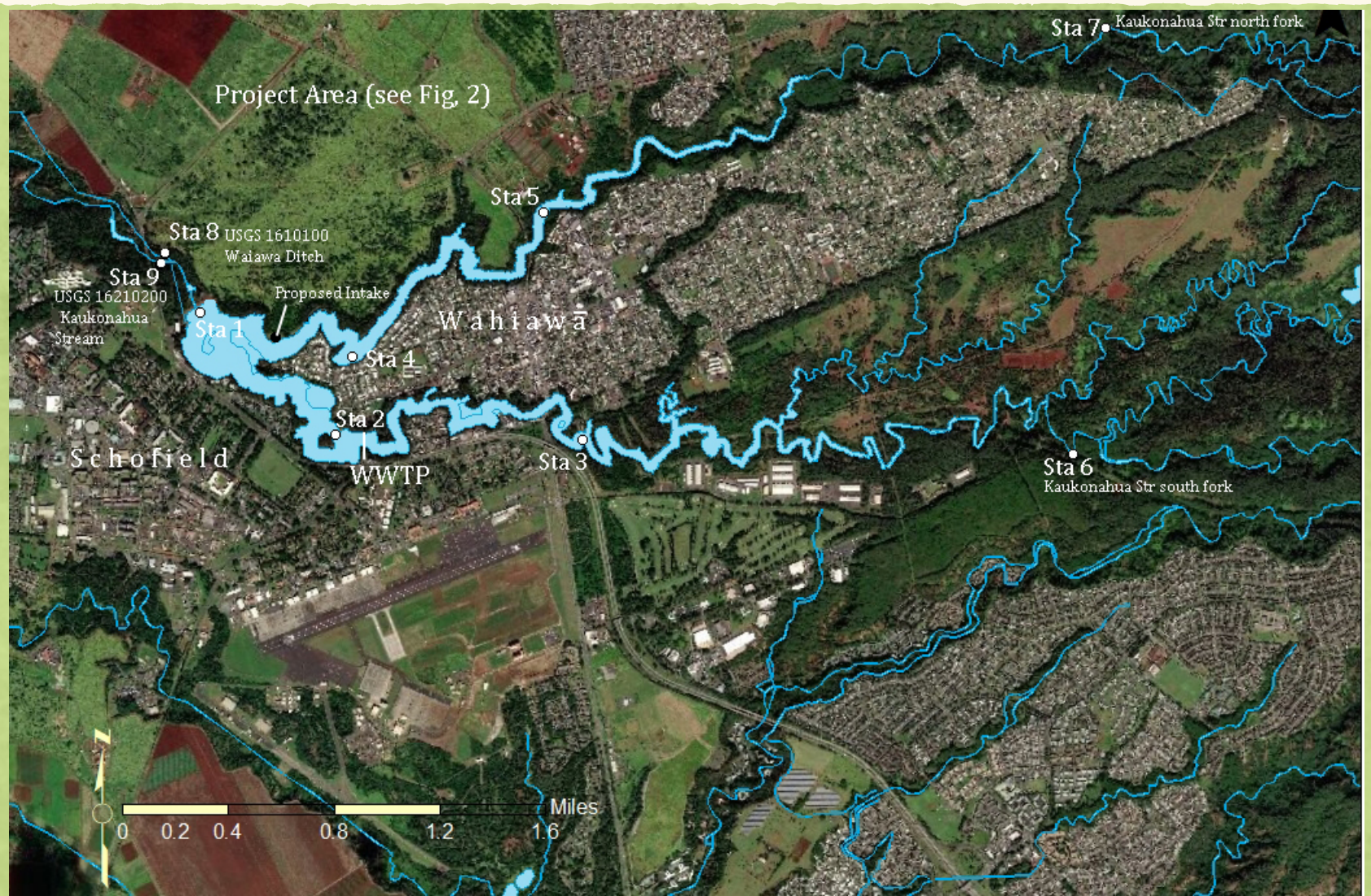
Tucunare (introduced)

Photo credit: Hawaii Bass Fishing website

Photo credit: Frank Bonaccorso, USGS

Pueo (short-eared owl) is state-listed as an endangered species.

Water Quality



ESSENTIAL PLANT NUTRIENTS

AMMONIUM NITRATE & NITRITE ORTHO-PHOSPHATE

NH_4 NO_3 & NO_2 PO_4

- The basic WQ problem is **nitrogen** compounds discharged in large amounts from the Wahiawā WTTP. Ammonium is converted to nitrate+nitrite in the presence of oxygen in the reservoir. As a result, oxygen concentrations can be significantly reduced in certain areas of the reservoir, but especially in deep water (**epilimnion**).

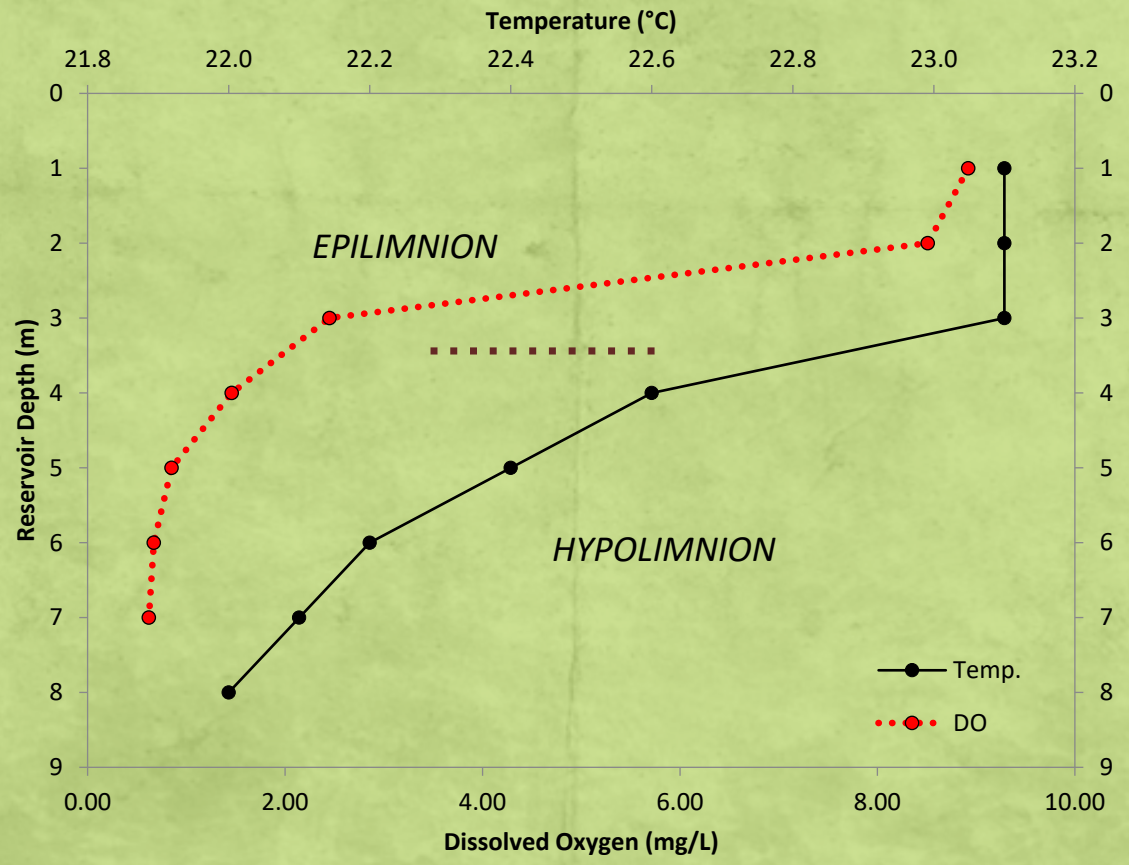
- Removing WWTP discharge to Wahiawā will result in significant improvements to Wahiawā Reservoir water quality.

Location	NH_4 (µg/L)	NO_3+NO_2 (µg/L)	Total N (µg/L)	Total P (µg/L)	PO_4 (µg/L)	N:P (ratio)	Chl. α (µg/L)
North and South Forks (inflow)	20	15	136	19	3	11	0.3
Wahiawā WWTP discharge	1429	957	7510	58	27	231	---
Wahiawā Reservoir	261	222	662	45	9	29	9.2
Kaukonahua Stream (outflow)	85	101	323	30	6.1	27	2.5

Wahiawā Reservoir (Lake Wilson) existing/future water quality conditions

WWTP effluent is impacting negatively on water quality of Wahiawā Reservoir

- WWTP effluent is discharged into bottom water (**hypolimnion**), but the warm effluent rises to the surface.
- WWTP effluent contains a high concentration of ammonium, which depletes oxygen in the water as bacteria convert it to nitrate.



- Phytoplankton consume the nutrients producing algal blooms.
- This **eutrophication** causes fish kills.
- Improved DO (**dissolved oxygen**) at depth will increase populations of fishes.

Wahiawā Reservoir (Lake Wilson)
Potential future conditions

- Water quality in Wahiawā Reservoir will improve and more closely reflect water quality of the north and south forks of Kaukonahua Stream.
  - low nutrient concentrations
  - reduced N:P ratio

- Result will be insufficient nutrients to produce **eutrophication**.

- Water quality in Kaukonahua Stream and Kaiaka Bay will improve.

Any questions?

Natural Resource Assessment

Proposed irrigation system improvements for Central O‘ahu
(Agribusiness Development Corporation recycled water project
May 2021

AECOS, Inc.
Dr. S. A. Cattell
Eric Guinther

Environmental Assessment – Next Steps

1. Draft EA available from June 8, 2021
   - OEQC online library (https://health.hawaii.gov/oeqc/)
   - Link posted on ADC's website
2. 30-day public review and comment period
3. Final EA Publication in July/August by OEQC
   - OEQC online library (https://health.hawaii.gov/oeqc/)
   - Link posted on ADC's website

THE LIMTIACO CONSULTING GROUP

CIVIL ENGINEERING AND ENVIRONMENTAL CONSULTANTS

Thank you and stay safe!

Any questions?

Claire Oshiro / John Katahira

claire@tlcghawaii.com / john@tlcghawaii.com

(808) 596-7790