



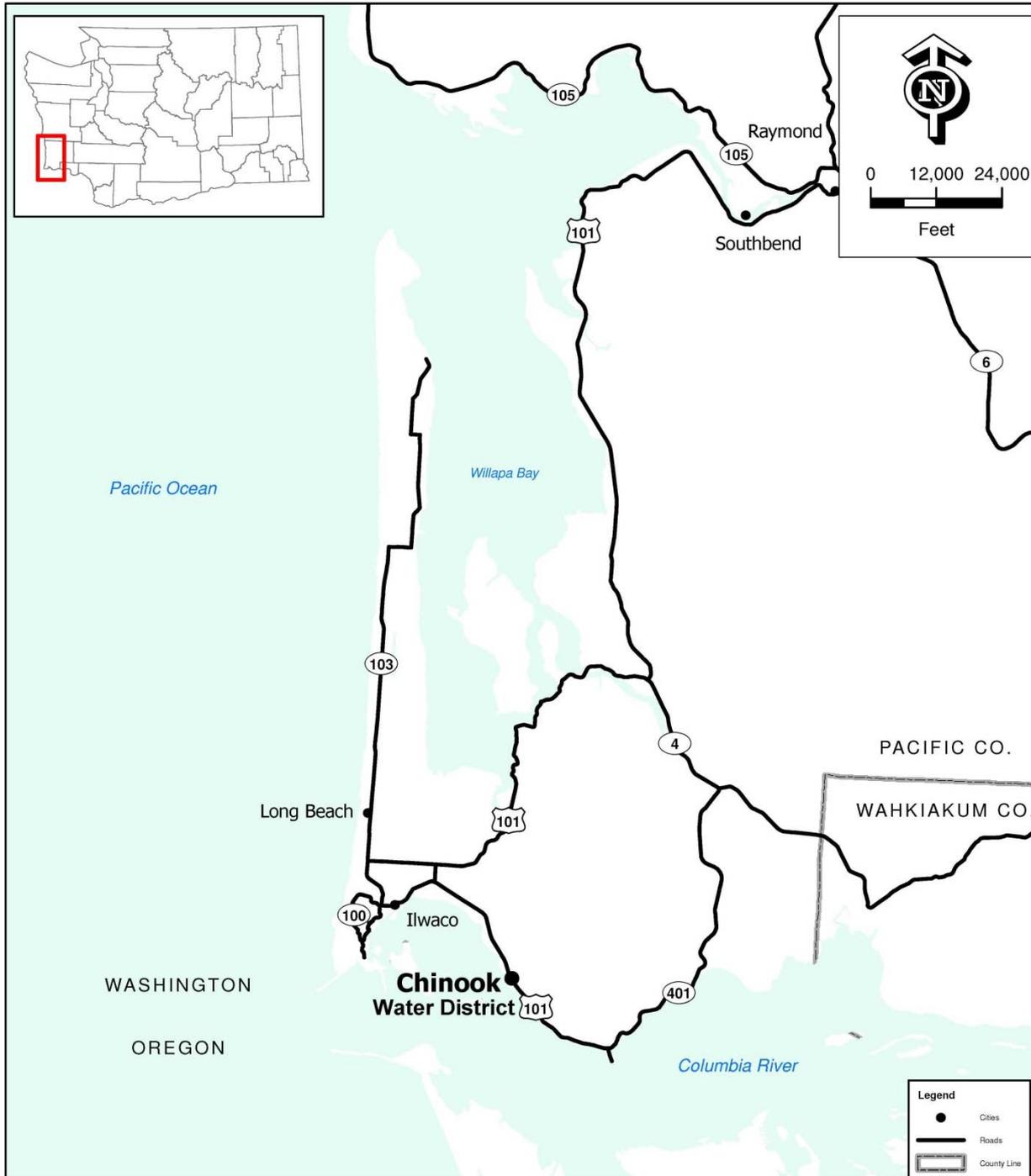
CHINOOK WATER DISTRICT



REPLACING CONDUIT BY BORING & GROUTING AT
FRESHWATER CREEK DAM

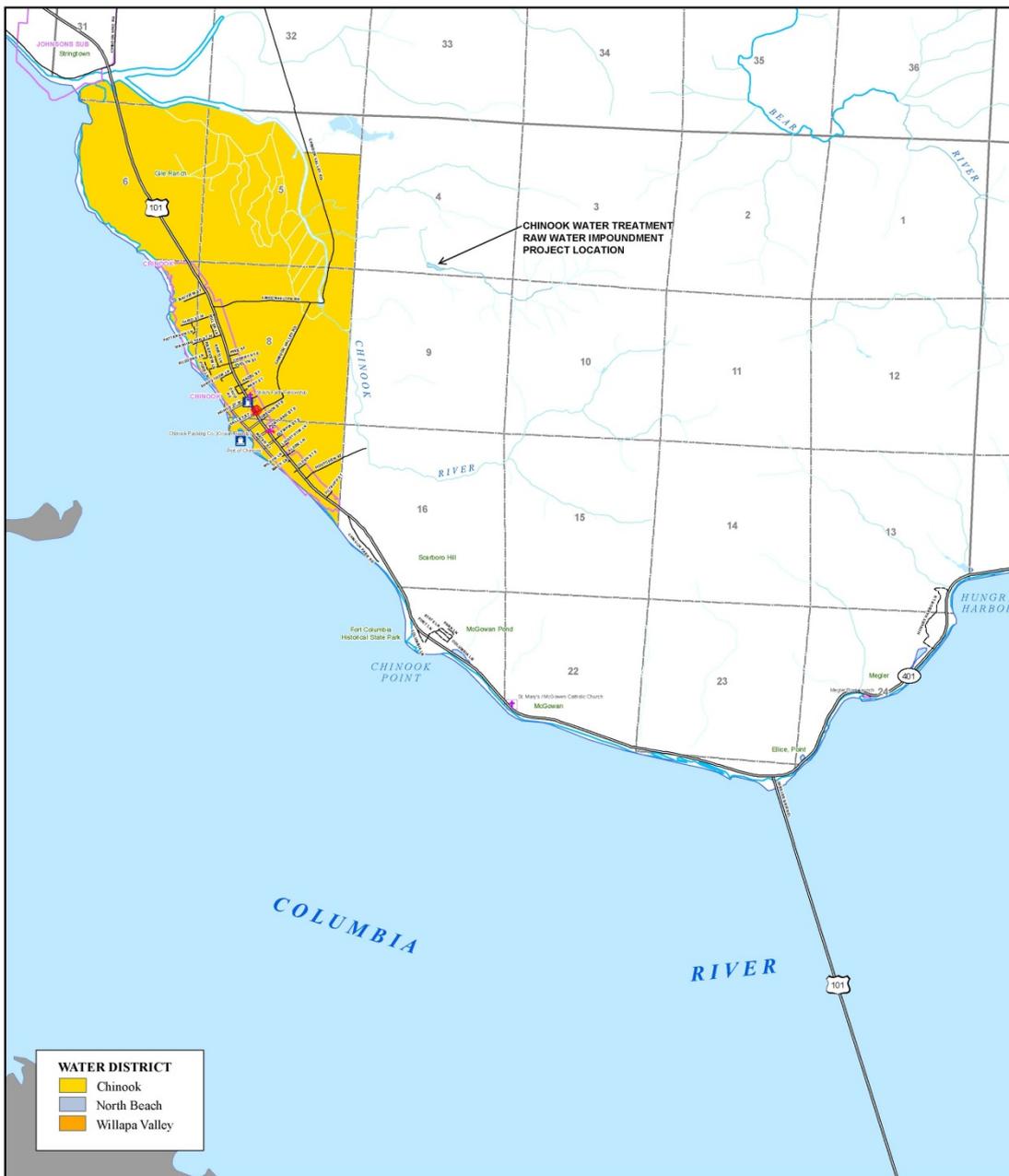
CHINOOK WATER DISTRICT WATER SUPPLY RESTORATION

LOCATION MAP



CHINOOK WATER DISTRICT WATER SUPPLY RESTORATION

WATER DISTRICT MAP



WATER DISTRICT

- Chinook
- North Beach
- Willapa Valley

0 2,000 4,000 Feet
SCALE: 1:24,000

Legend

<ul style="list-style-type: none"> Airport Class C Assisted Living Center Boat Launch Camp Chamber of Commerce Church Clinic Post 	<ul style="list-style-type: none"> Emergency Management Fire Department Gasoline Station Grange Hall Highway Hospital School 	<ul style="list-style-type: none"> Library PC Courthouse PC DCD PC Sheriff PC Shop PUP Transfer Station 	<ul style="list-style-type: none"> Telephone Company Transit System Wastewater Plant Water Treatment Plant City Limits Township Line Section Line 	<ul style="list-style-type: none"> State Patrol Lanes Highways County Roads Meter Collectors Local Access Roads City Streets Plat Boundaries 	<ul style="list-style-type: none"> Hydrology Type One Type Two Type Three Type Four
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Pacific County
Department of Public Works
Geographic Information Systems

300 Memorial Drive
Seaside, OR 97138
Phone: (503) 738-6200

This map is intended for reference purposes only. Any other use other than that intended could be the sole responsibility of the user.

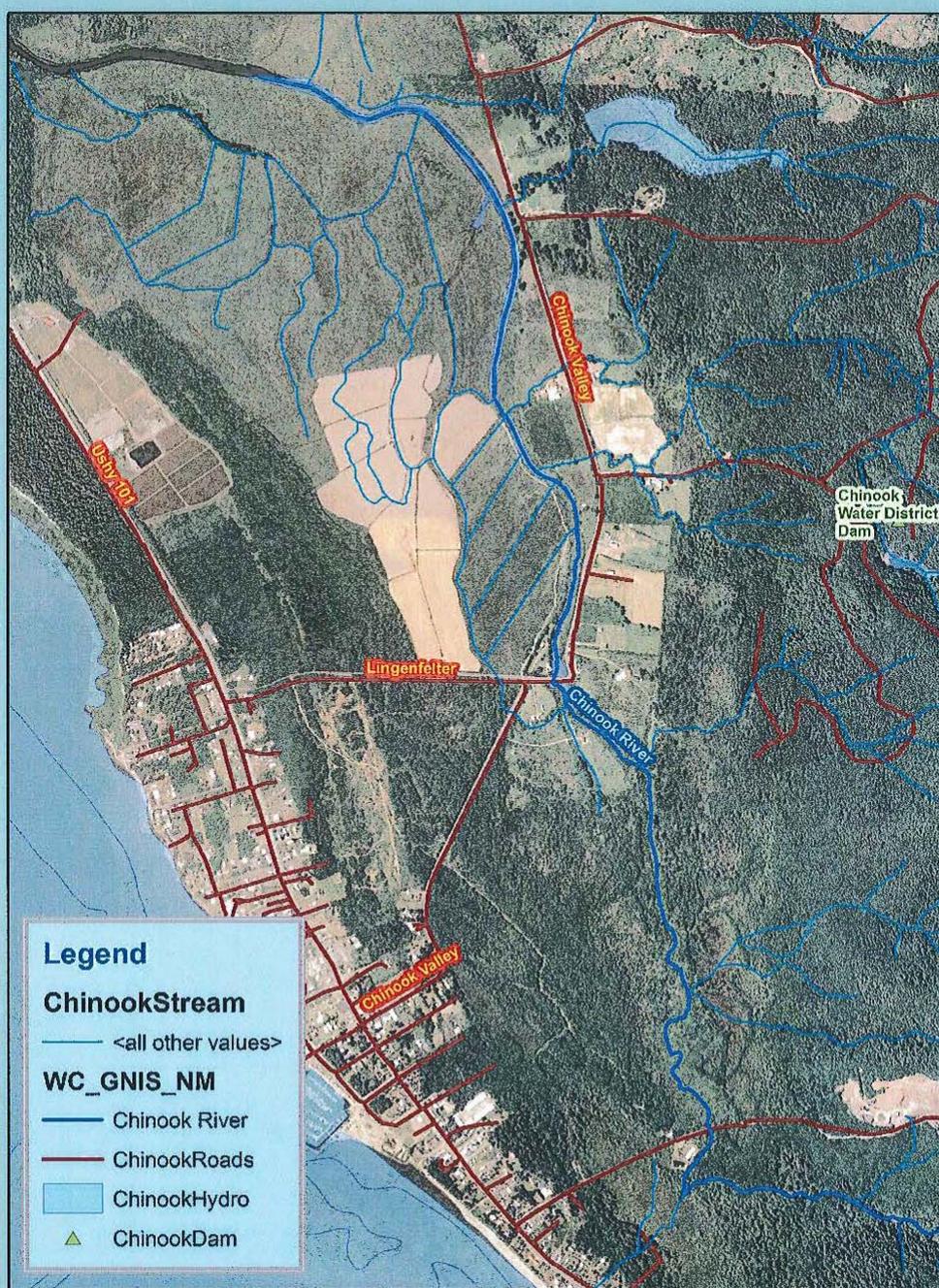
Water District Map

T. 09 N., R. 10 W.



CHINOOK WATER DISTRICT WATER SUPPLY RESTORATION

CHINOOK DAM LOCATION

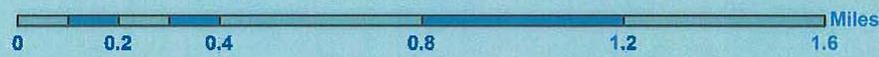


Legend

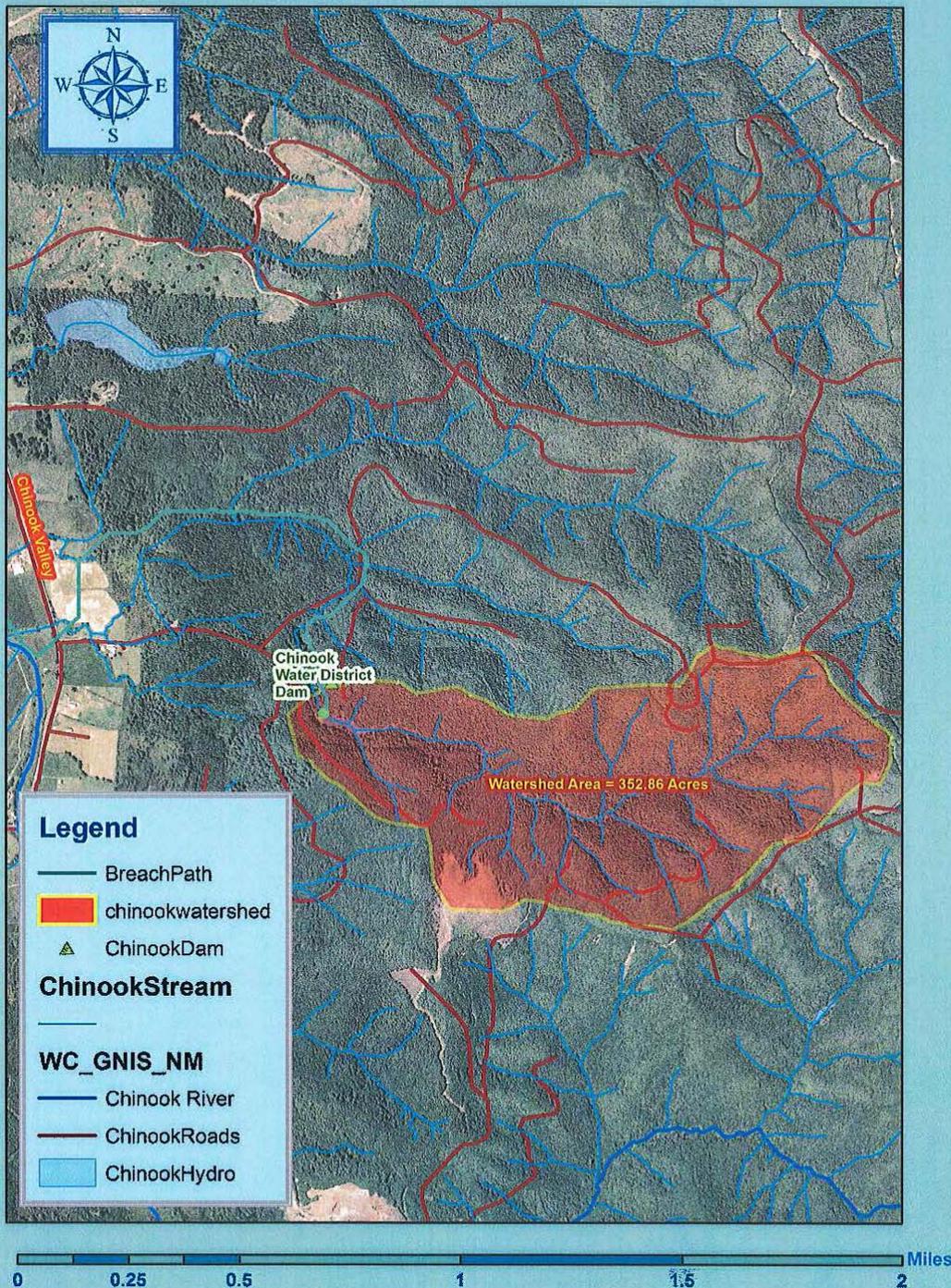
ChinookStream
— <all other values>

WC_GNIS_NM

- Chinook River
- ChinookRoads
- ChinookHydro
- ▲ ChinookDam



CHINOOK DAM WATERSHED



PROJECT BACKGROUND

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION



- Raised in 1960's

PROJECT BACKGROUND

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

1991 (Dam Breached)

- **Major breach in 1991**



PROJECT TEAM

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **PACE ENGINEERS, INC.**
 - **MEAD & HUNT**
 - **PACIFIC GEOTECHNICAL/HART CROWSER**

CONSTRUCTION

- **TAPANI UNDERGROUND, INC.**
 - **GONZALES BORING & TUNNELING**



PROBLEM STATEMENT

- **Years of accumulated silt**
- **3 existing pipe penetrations**
 - **AC – non-functional**
 - **CI – original; valve inoperable**
 - **CMP – drainpipe; slidegate failed**
 - **Intake in silt**
- **Dredge and provide new piping**
- **Restore functionality of low level outlet**
- **Eliminate seepage paths through old conduits**

CHALLENGES

- ❑ **Condition of existing infrastructure**
- ❑ **Keep District in water during project**
- ❑ **Disposal of accumulated solids**
- ❑ **New pipe options**
 - ❑ **Insert pipe through CMP**
 - ❑ **CIP liner**
 - ❑ **Directional drilling using mud**
 - ❑ **Dry auger-drilled/jacking**
- ❑ **No documentation for concrete dam**
- ❑ **Weather conditions**

CMP OUTLET PIPE

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION



SLIDEGATE FOR CMP OUTLET

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION



ACCUMULATED SOLIDS

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION



SOLUTION

- ❑ **Drain Reservoir (7-10 days to silt)**
- ❑ **Temporary Water Source by rerouting flow to portable tank**
- ❑ **Excavate accumulated silt and dispose of**
- ❑ **Bore and Jack new penetration through dam**
- ❑ **Grout full existing conduits through dam**
- ❑ **New dock and intake**
- ❑ **Refill reservoir**

SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **Drain Reservoir (7-10 days to silt)**



Pump supported by float/raft

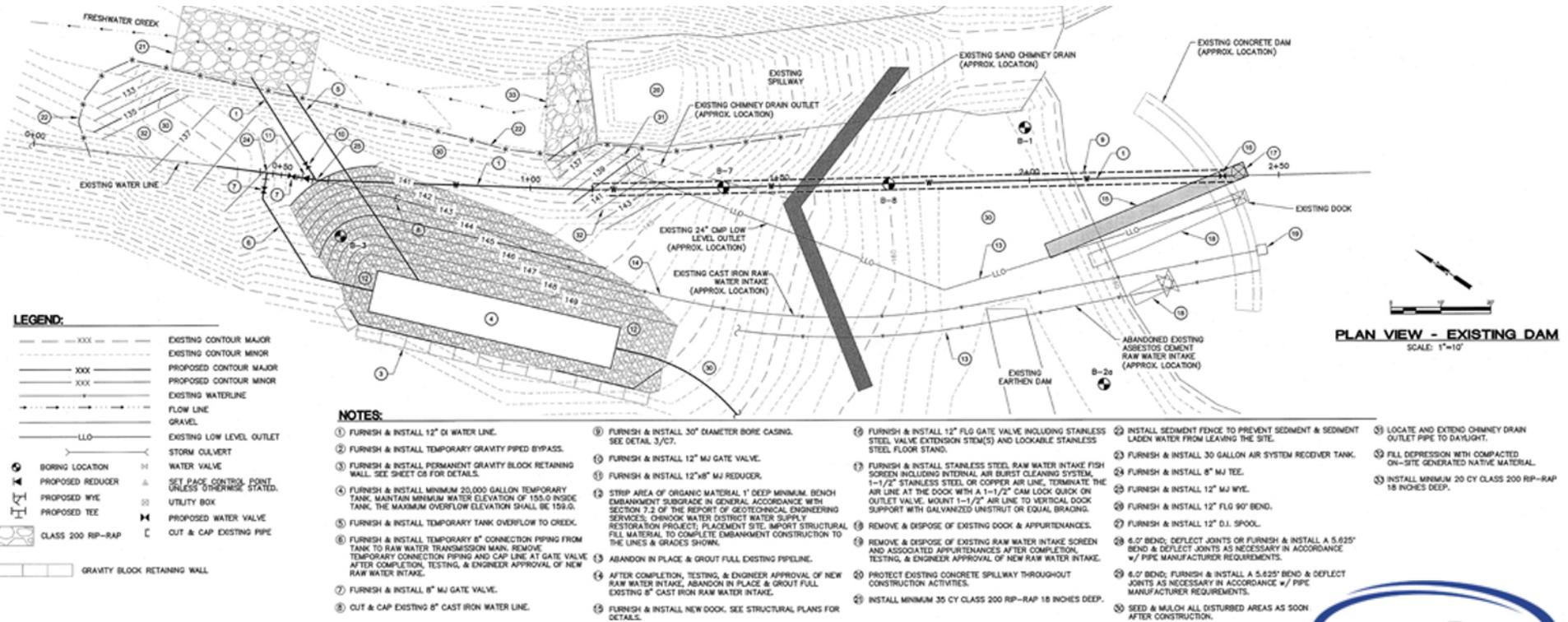
SOLUTION

- **Temporary Water Source by rerouting flow to portable tank**



Temporary piping

Temporary Water Source by rerouting flow to portable tank



PLAN VIEW - EXISTING DAM
SCALE: 1"=10'

SOLUTION

- **Temporary Water Source by rerouting flow to portable tank**



Temporary water tank

SOLUTION

CHINOOK WATER DISTRICT WATER SUPPLY RESTORATION

- **Excavate accumulated silt and dispose of**



Excavation



**Excavation/Increase
Storage**

SOLUTION

CHINOOK WATER DISTRICT WATER SUPPLY RESTORATION

- **Bore and Jack new penetration through dam**



Boring through dam

SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **Bore and Jack new penetration through dam**



Boring through dam

SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **Bore and Jack new penetration through dam**



Boring through dam

SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **Bore and Jack new penetration through dam**



Boring through dam

SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION



- **Bore and Jack new penetration through dam**

Success!

SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **Bore and Jack new penetration through dam**



Preparing new pipe

SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **Bore and Jack new penetration through dam**



SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **Bore and Jack new penetration through dam**



New casing

SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **Bore and Jack new penetration through dam**



New pipe – 12" DI

SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **Grout full existing conduits through dam**



Pipe relative to original penetrations

SOLUTION

- **Grout full existing conduits through dam**



Grout annular space



Grout full old penetrations

SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **Grout full existing conduits through dam**



SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **New dock and intake and refill reservoir**



Complete

SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **New dock and intake and refill reservoir**



SOLUTION

CHINOOK WATER DISTRICT
WATER SUPPLY RESTORATION

- **New dock and intake and refill reservoir**



SOLUTION

- **New dock and intake and refill reservoir**



SOLUTION

- **New dock and intake and refill reservoir**





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