

BUILDING A WORLD OF DIFFERENCE

1 May 2015

YOUR BONITA (BEAUTIFUL) PUMP STATION, THE DISTRIBUTION SYSTEM HEART

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AGENDA

- **Program and Project Background**
- **Bonita Pump Station Design Features**
- **Construction Highlights**

PROGRAM AND PROJECT BACKGROUND

LAKE OSWEGO TIGARD WATER PARTNERSHIP

- August 2008 – Cities of Lake Oswego and Tigard enter partnership agreement to share drinking water resources and costs.
- City of Tigard has been a customer of Lake Oswego since 1970's.
- Tigard customers gain a long-term, affordable drinking water source.



Overall Facilities Map

PROJECT BACKGROUND

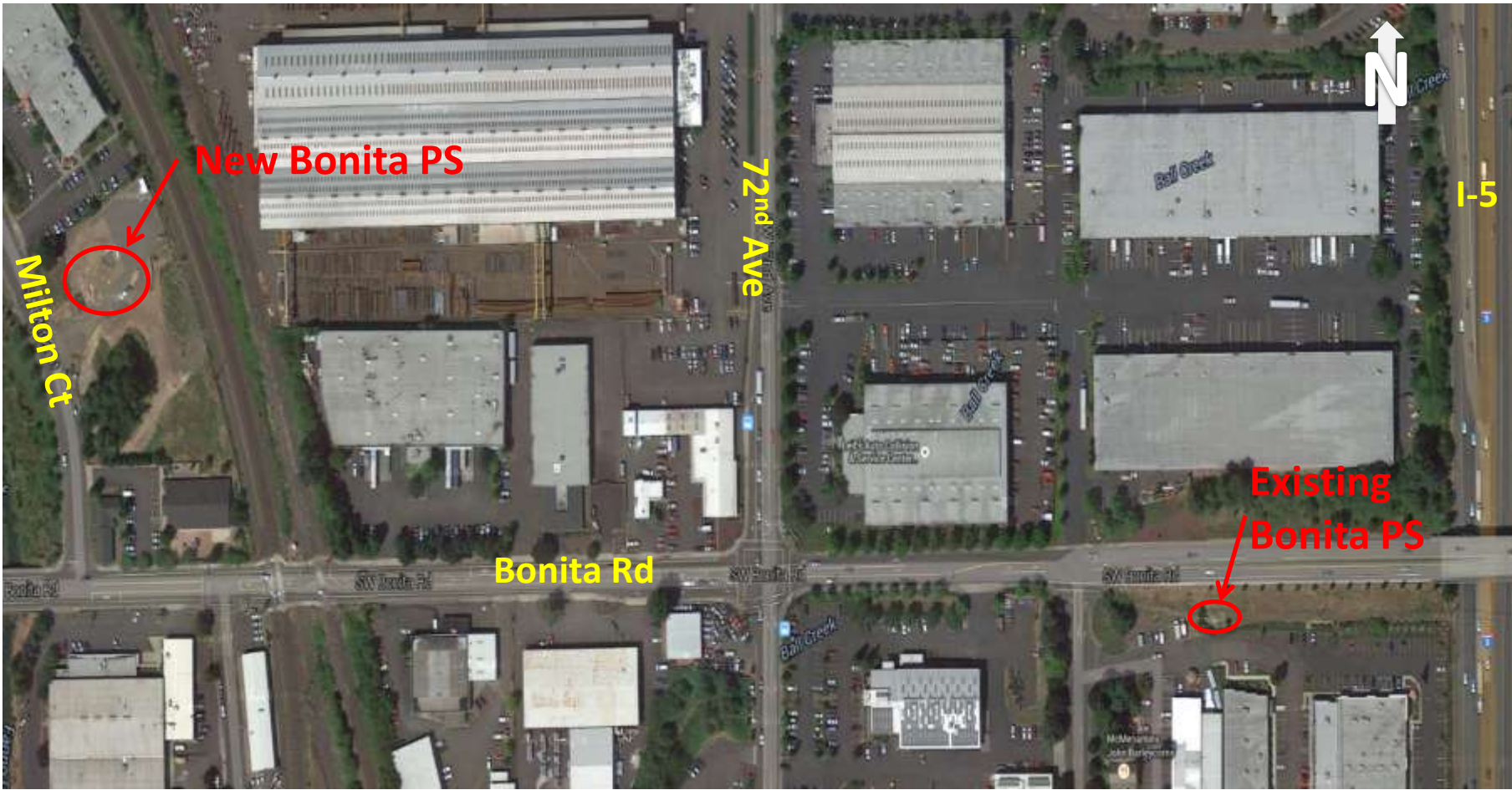
Tigard Water System

- Replace existing PS
 - Future demand 14-20 MGD
 - Multiple sources of supply
 - New dual pumping zone pump station
- Build-out capacity = 20 MGD
 - Waluga Reservoir (LO) to Tigard 410 and 470 zones



Source: www.tigard-or.gov

PROJECT BACKGROUND



Location Map

DESIGN FEATURES

BONITA PUMP STATION DESIGN FEATURES

Pump Station Capacities

- 2016 demands = 14 MGD
 - 470 zone = 9 MGD
 - 410 zone = 5 MGD
- Build-out = 20 MGD
 - 470 zone = 14.4 MGD
 - 410 zone = 5.5 MGD



BONITA PUMP STATION DESIGN FEATURES

- VFD Driven Vertical Turbine Pumps
- Pump to two zones; PZ 410 and PZ 470
- 4 pumps – Dual Service PZ
 - PZ 470 = 3.67 MGD
 - PZ 410 = 4.50 MGD
- 1 Pump = 4.50 MGD
- Future Pump = 4.50 MGD



BONITA PUMP STATION DESIGN FEATURES

Building Construction

- 2010 OSSC
- 2012 Oregon Energy Code
- Low height impact
- Conditioned spaces
- Insulated wall panels
- Skylights over pumps
- CMU Walls
- Standing seam metal roof (insulated)



Suction Header (buried/outside)

VTP

Future VTP

470 Zone

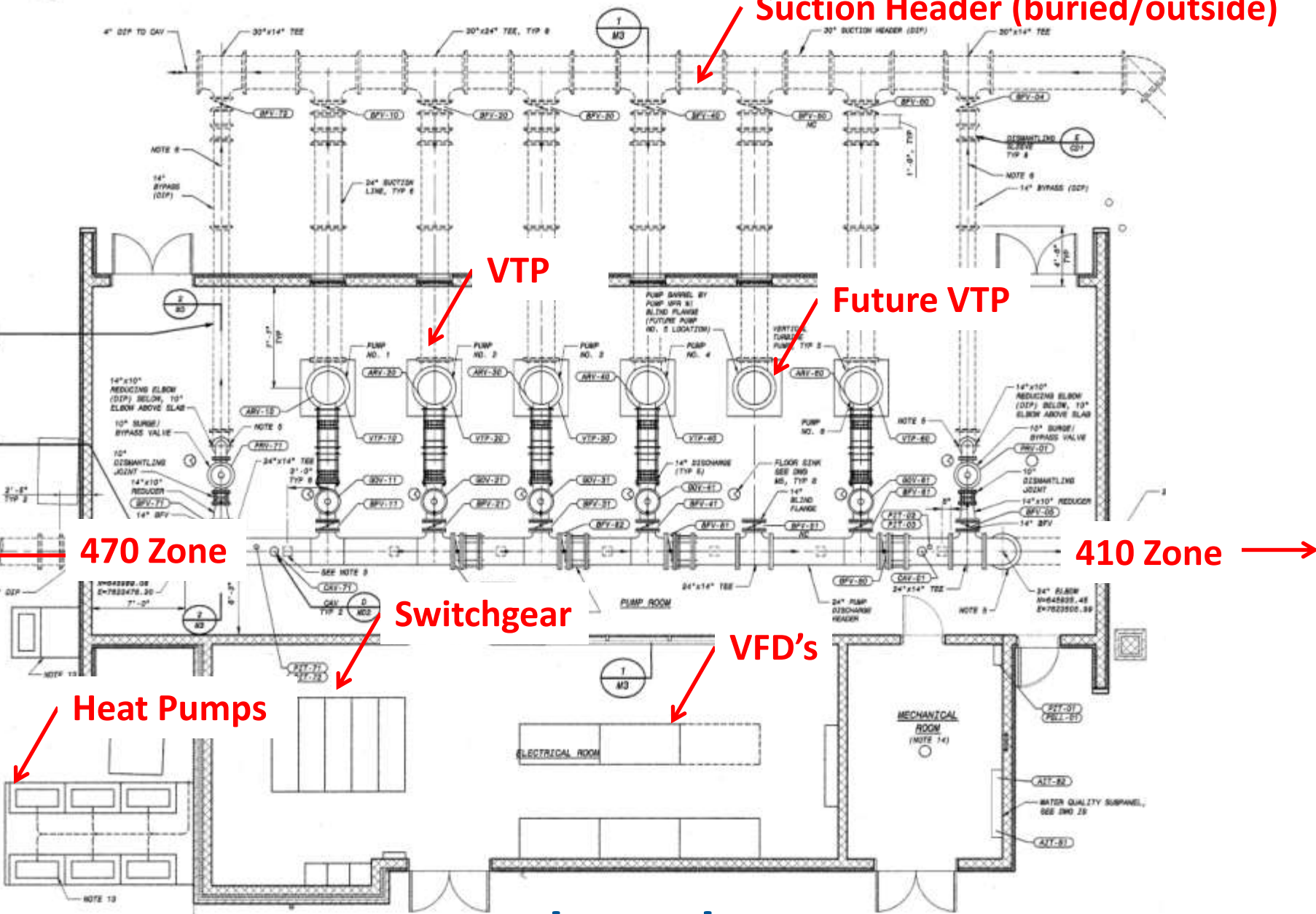
410 Zone

Switchgear

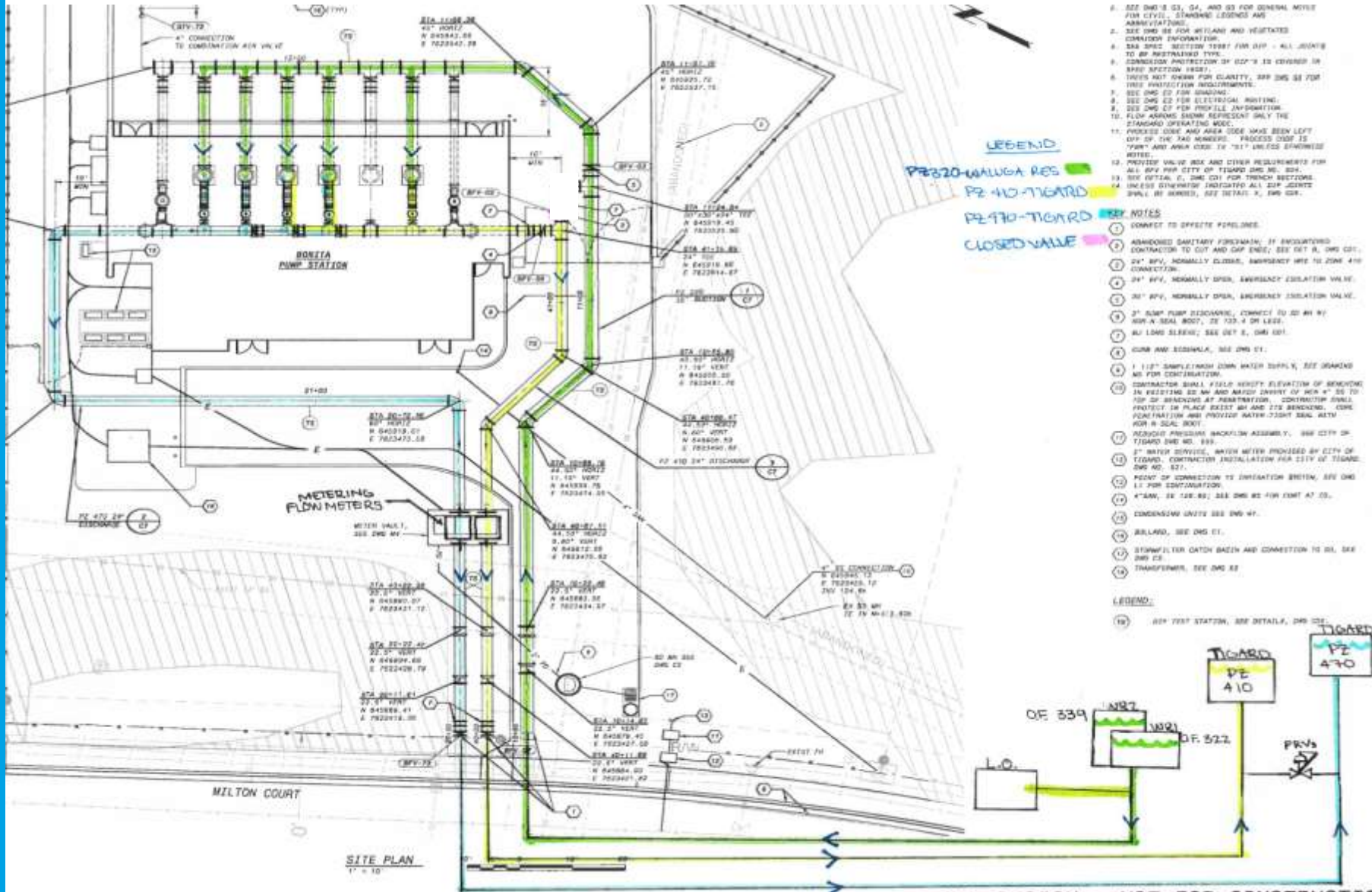
VFD's

Heat Pumps

Floor Plan



BONITA PUMP STATION FEATURES



CONSTRUCTION HIGHLIGHTS

NOISE LIMITATIONS

Design Criteria:

- 40 dBA at noise-sensitive property boundaries.
- 60 dBA at non noise-sensitive property boundaries.



Heat Pumps



Engine Generator



Acoustical Intake Louvers



Figure 3-2 Project expected sound levels with standard package equipment (normal operation, excludes engine generator).

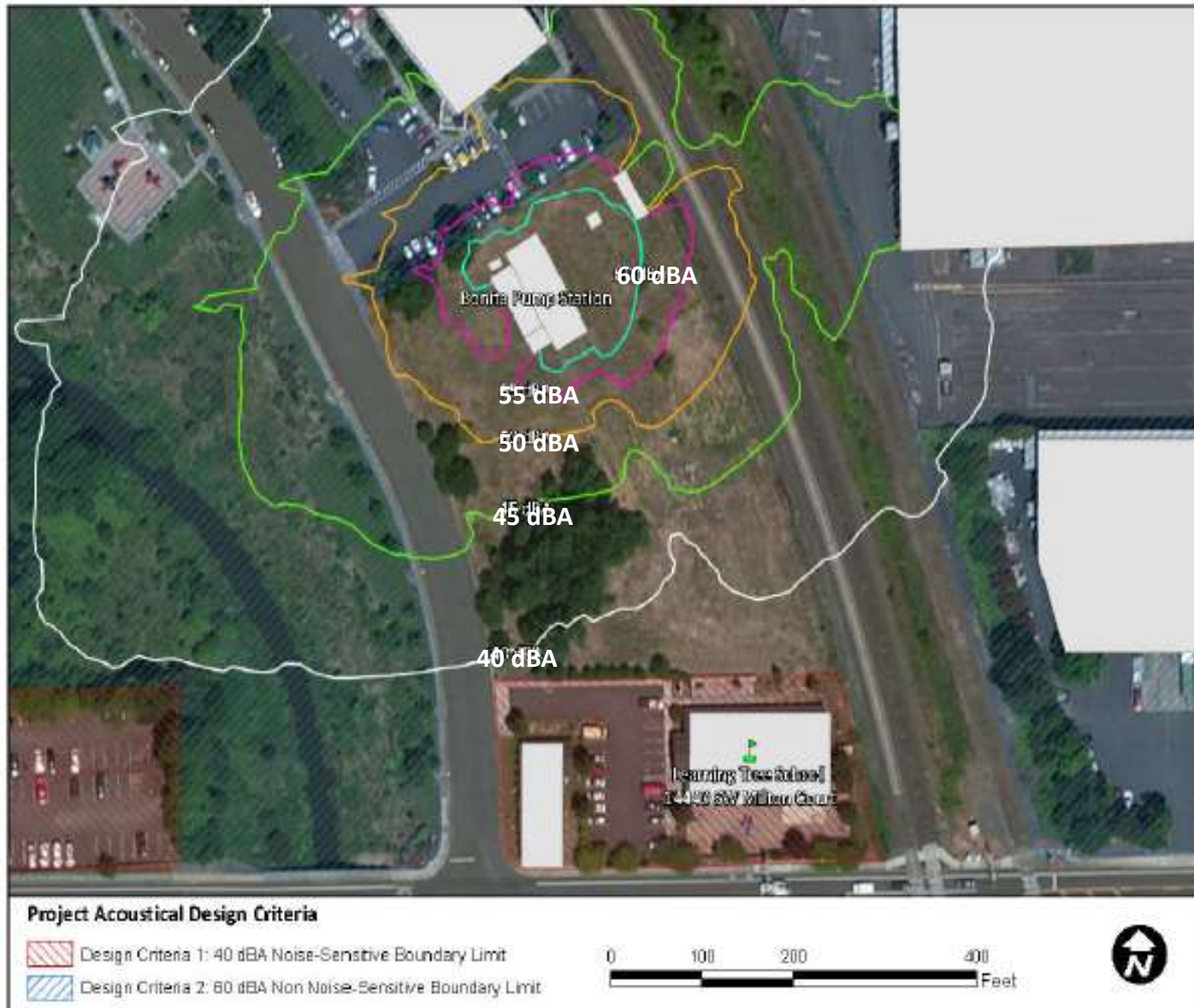


Figure 4-1 Project expected sound levels with mitigation (normal operation, excludes engine generator).

INSULATED BUILDING ENVELOPE

- Compliance with Oregon Energy Efficiency Specialty Code
- Simplified Trade-Off Approach - COMcheck
- Insulated roof panels = R-20 ci
- Insulated wall panels = R-11 ci
- Roofing consultant



FLEXIBILITY IN SUCTION AND DISCHARGE PIPING

- Liquefaction-induced settlement
- Displacement during MCE = 3-inches
- Flexibility in piping vs alternate foundation design.
- Mechanical couplings
- Tie-rod design must consider stress and strain per HI.



FLEXIBILITY IN SUCTION AND DISCHARGE PIPING

- Two joints to provide flexibility
- No joint deflection during installation
- Pump cans and buried piping isolated from building foundation



PRESSURE TESTING BUTTERFLY VALVES

- BFV's pressure tested prior to installation
- Each side of valve disc tested



SUMMARY

- Consider requirements of the Oregon Energy Code.
- Acoustical analysis is a useful tool to identify and mitigate high noise levels.
- Consider tie rod strain, not just stress.
- Consider pressure testing valves before installation.



QUESTIONS?

CONTACT INFORMATION

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