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Presentation to ACEH to Review Site Conditions and Discuss Path Forward

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Objective

- Review site data.
- Clarify and obtain ACEH concurrence regarding site conditions and path forward.

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Outline

- Site History
- Site Conditions:
  - Sources
  - Site characterization
  - Plume stability
  - Potential receptors
- Conclusions and Recommendations

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Site History

- USTs removed in 1996
- Subsurface investigations from 1996 through 2007
- Routine groundwater monitoring since 1998
- AIS pilot test January-February 2008
- AIS operation in source area April 2009 – present
- Ongoing AIS O&M and ground water monitoring quarterly in source area (10 wells) and semiannually plume wide (29 wells)

Site Conditions

1. Primary sources have been removed.
2. Pending confirmation, apparent source area of plumes (vicinity of MW-9) has been reduced to a point that it is no longer contributing significant mass to the plume
3. Site is adequately characterized
4. Dissolved plume is generally stable
5. No sensitive receptors likely to be affected by existing or future anticipated plume

Site Conditions (cont'd)

1. Sources

- Former known USTs have been removed
- No data that alleged former UST beneath ASTs is a source
- Residual LNAPL, if present, appears to be immobile, and has responded to AIS operation

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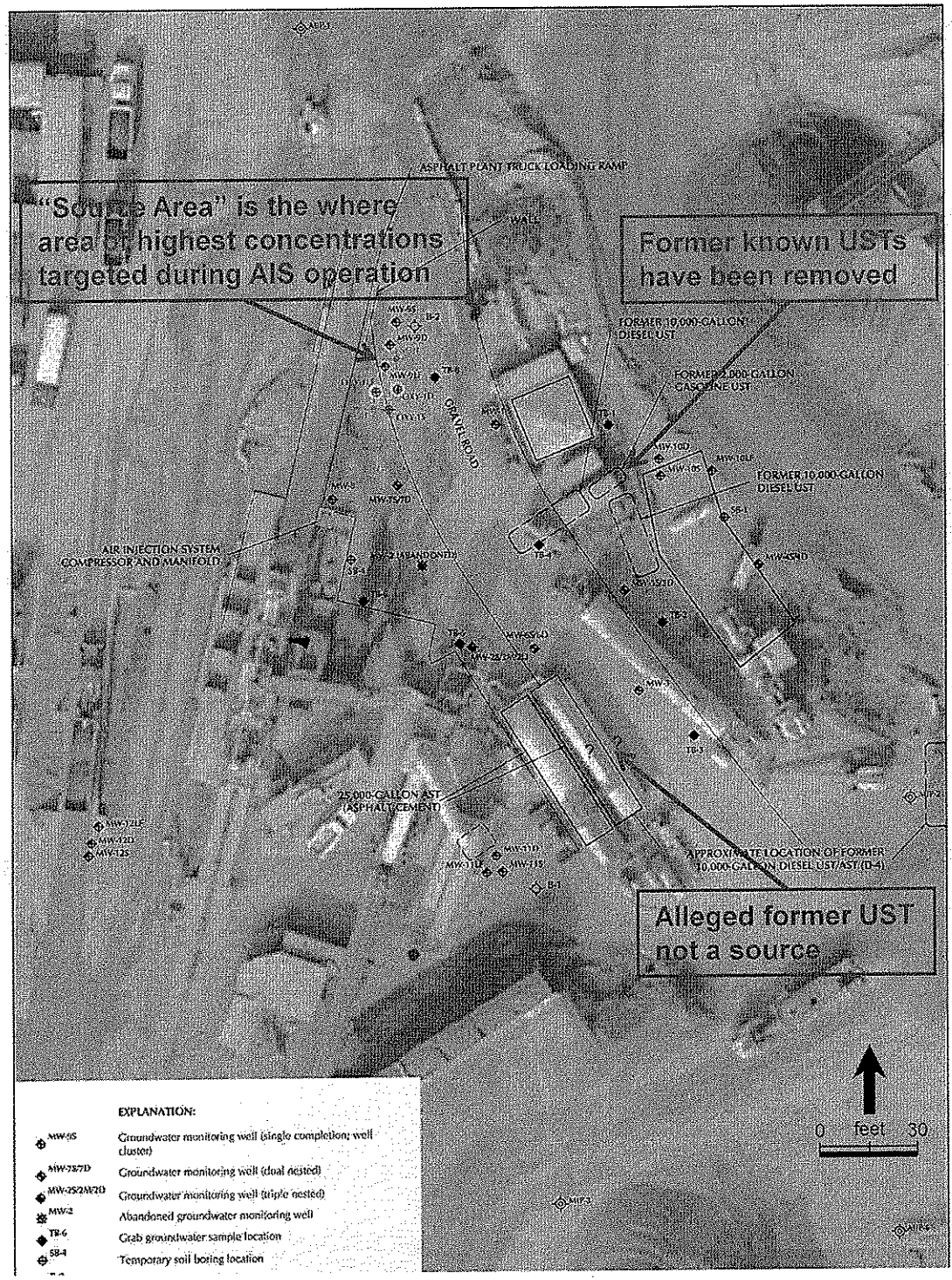
Sources



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Site Conditions (cont'd)

Alleged Former UST Beneath ASTs is not a Source

- Alleged former diesel UST was abandoned in place
- Data do not indicate source beneath ASTs
  - Low/ND TPH concentrations down/cross gradient
    - Groundwater from shallow wells (MW-11S and MW-3)
    - Soil from temporary soil boring (TB-3)
  - Relatively higher TPH concentrations:
    - upgradient (MW-2 and MW-6)
    - deeper (MW-11D)

Site Conditions (cont'd)

Residual LNAPL, if present, appears immobile and has responded to AIS

- Historic evidence for residual LNAPL in the source area:
  - Sporadic odor/sheen observed during purging/sampling events
  - Measurable LNAPL detected in former well MW-2 (1999-2002)
  - Free phase observed during drilling (MW-9D)
- Field screening during drilling indicated hydrocarbons present (odor/sheen/PID) (MW-1, MW-2, MW-6, MW-7, MW-9, MW-11, and OXY-1)
- TPH concentrations now generally below levels that indicated communication with LNAPL (i.e., <15,000 ppb)
- Air injection effective at reducing TPH concentrations
- Look for rebound after AIS shut down

2. Site is Adequately Characterized

- Good groundwater monitoring well coverage
- Long groundwater data record, since:
  - 1998 (3 wells)
  - 2005 (15 wells)
  - 2006 (26 wells)
- MIP/grab gw investigation characterized lateral/vertical plume extent (Feb-Mar 2007)
- ACEH concurred no additional investigation required (April 2007)

Site is Adequately Characterized (cont'd)

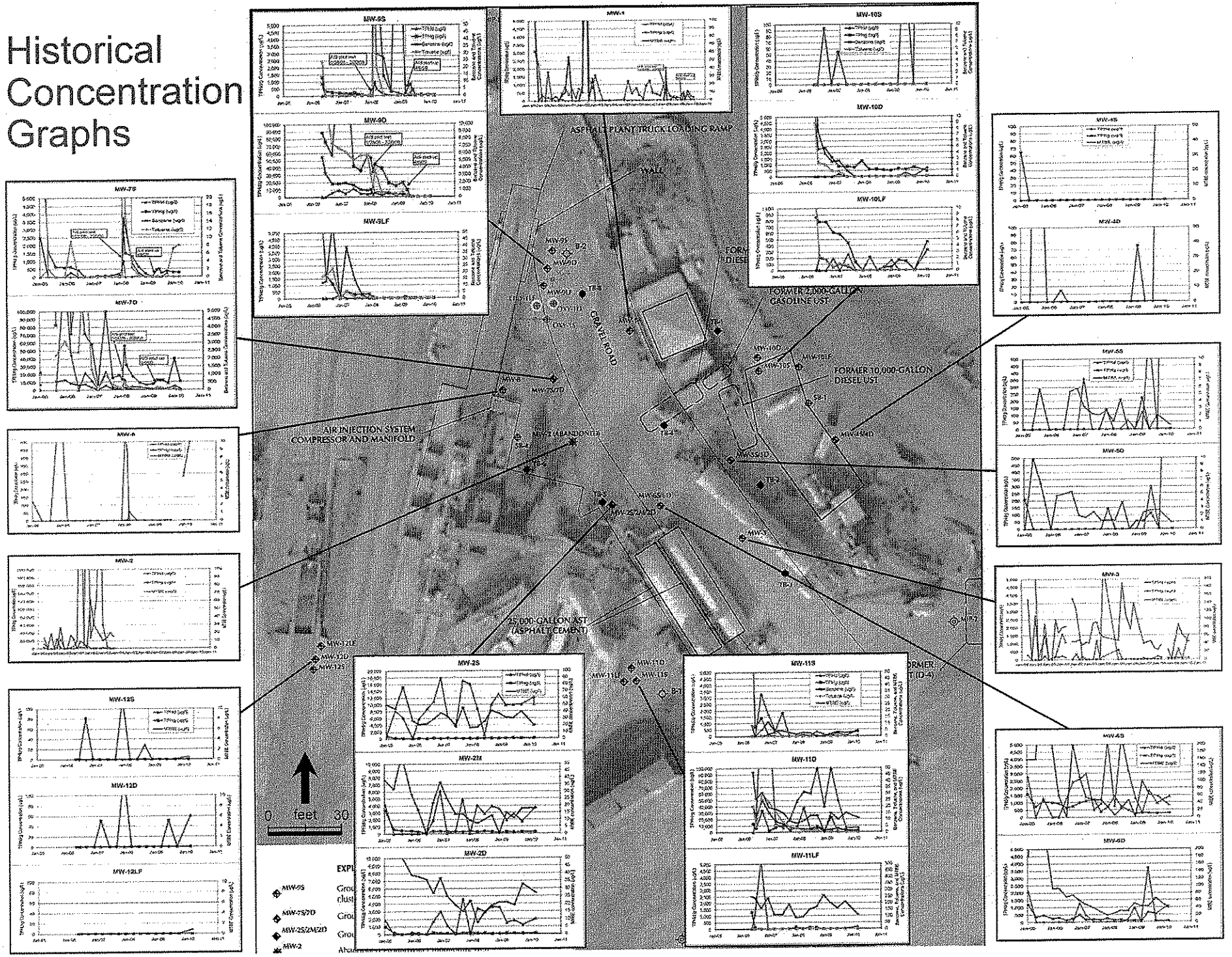
Site characterization discussion points

- Groundwater flow direction locally ESE to S:
  - Varied, likely influenced by mining activities (pits, dewatering, water storage, and silting)
  - Not consistent with presumed regional flow to NW
  - Historically not consistent between shallow, deep, and Livermore Formation
- Generally have vertically downward gradients
- Characterization S and SE of MW-11 based on gw samples
- Known source area (vicinity of MW-9) not co-located with USTs

3. Dissolved plume is stable

- Isoconcentration contour maps plus concentration vs. time plots for the four primary analytes (benzene, MTBE, TPHg, and TPHd) in three zones (shallow, deep, and Livermore Fm.) used for assessment.
- Long-term concentration trends are generally decreasing or stable.
- Note few increasing trends in current data (2008 to present):
  - MTBE (MW-2M, MW-2D, MW-3, MW-6D, MW-11D, MW-11LF)
- Strongly decreasing concentration trends in air injection treatment area.

Historical Concentration Graphs



Benzene in groundwater

- Present in only 3 wells (highest detected concentration 2.2 ug/L in Mar 2010).
- Strongly decreasing concentration trends in Deep Zone and Livermore Fm. wells where concentrations historically highest.

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MTBE in groundwater

- Present only in southern portion of site.
- Highest concentration in Livermore Fm. well (MW-11LF) – concentration trend is stable.
- Slight increases in concentrations since 2008, but historic trend is decreasing/stable.

TPHg in groundwater

- Decreasing concentration trends in Deep Zone and Livermore Fm. wells where concentrations historically the highest.

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TPHd in groundwater

- Most widespread analyte.
- Lack of distinct concentration trends in most areas with historically highest concentrations.

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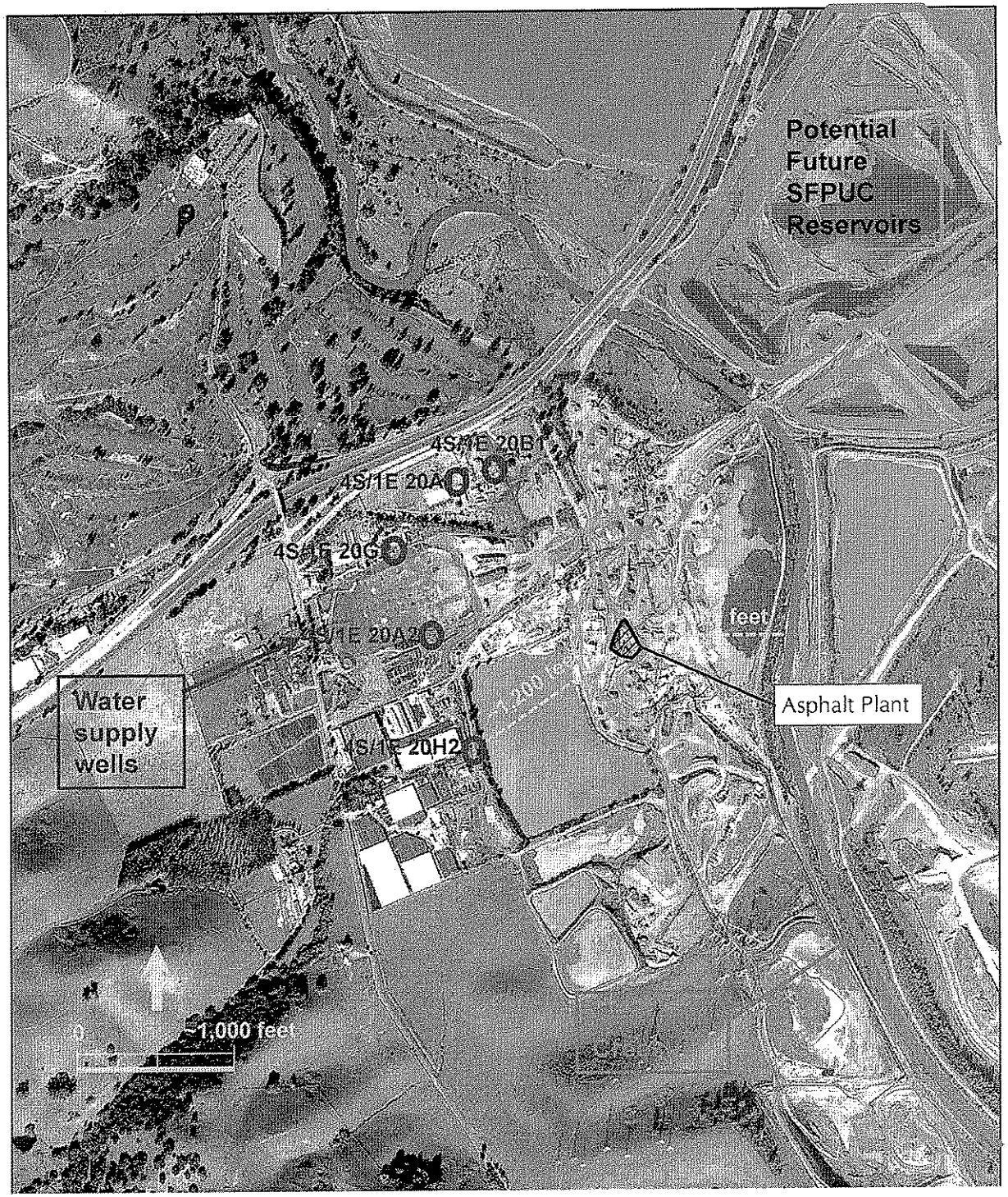
4. No sensitive receptors

Potential sensitive receptors considered:

- **Water wells** (five wells with long screens [>100ft] located >1,000ft W and SW)
- **Human health** (outdoor work area with limited access)
- **Alameda Creek** (large distance allows for degradation during migration, contamination migration beneath creek, losing creek)
- **SFPUC water storage plans** (planning stage, large distance to proposed pits, degradation during migration, dilution in pits)
- **Future aggregate mining** (may require water and soil management plans)

Receptors



Conclusions

- Former known USTs have been removed.
- The Site has been sufficiently characterized.
- Active remediation in the source area has been effective at significantly reducing concentrations.
- Site-wide and with few exceptions, concentrations are generally decreasing or stable.
- There are no significant sensitive receptors that would be affected by the impacted groundwater.

Recommendations

- Shut down the AIS.
- Conduct groundwater monitoring according to the existing program to monitor for potential rebound in the source area and to confirm the conceptual model presented above.
- Grant NFA if a period of groundwater monitoring after the termination of AIS confirms overall historical declining/stable trends in fuel constituent concentrations.

