

# LAYTONVILLE LANDFILL 2025 PUBLIC MEETING UPDATE

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- ▶ PhD in Civil and Environmental Engineering from University of Nevada, Reno, Masters from Utah State (same field) Undergraduate degree from Mississippi State University. Numerous peer reviewed publications and EPA guidance documents published.
- ▶ 36 years as an environmental consultant, 24 years working in Indian Country
- ▶ McGinnis and Associates has a staff of 8, we work with Tribes, local government and private clients throughout the Western United States
- ▶ Experience with landfill issues, groundwater monitoring, soil sampling, air quality and Tribal environmental grant programs
- ▶ Working with Cahto regarding the landfill since 2018

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MCGINNIS AND ASSOCIATES



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- ▶ Landfill location and setting
  - ▶ Landfill operation and monitoring
  - ▶ Monitoring overview
  - ▶ Current conditions
  - ▶ Conclusions and Recommendations

# OVERVIEW



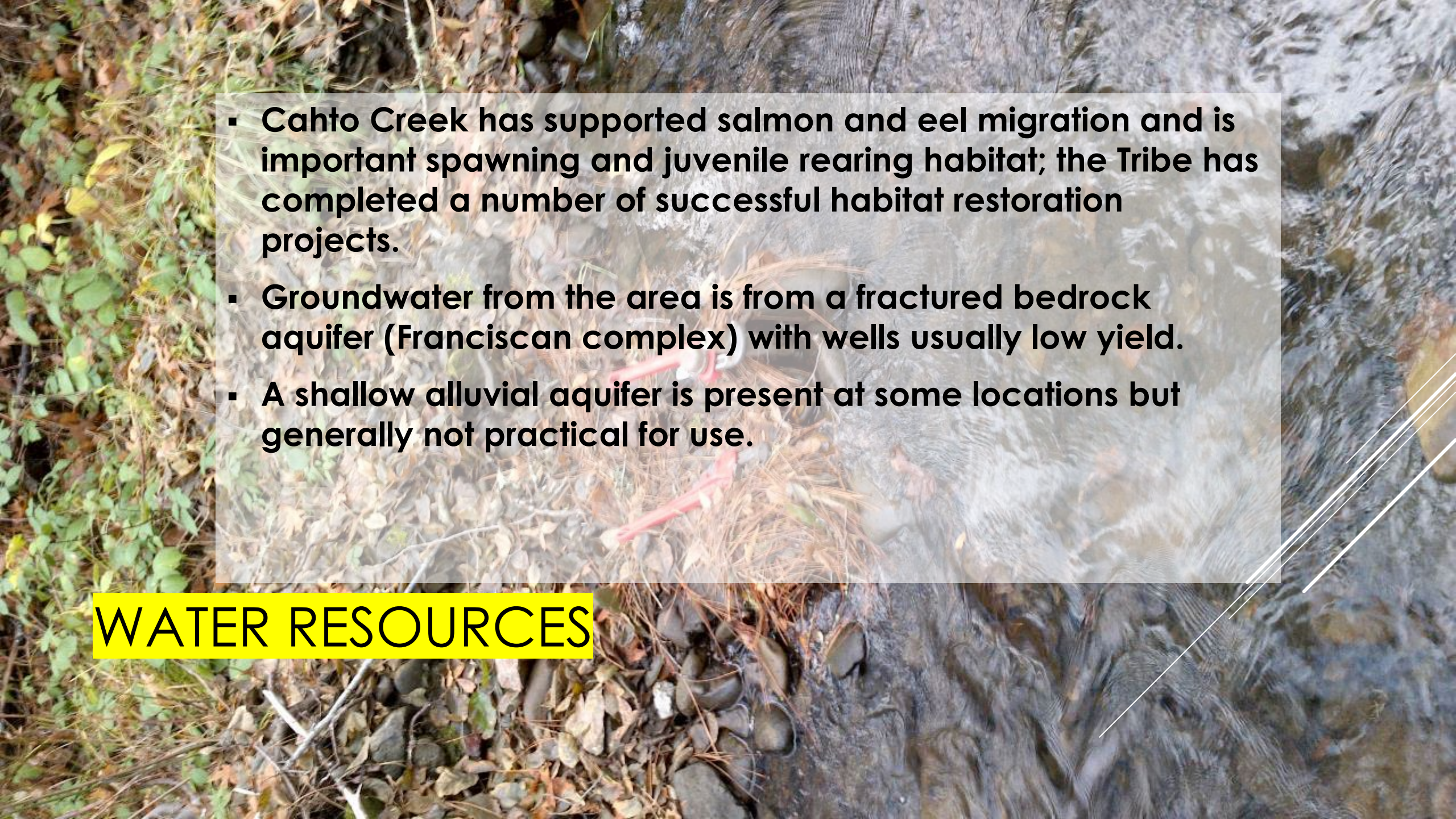
- ▶ The landfill is 1.5 miles west of Laytonville, CA, just north of the center of Mendocino County near Hwy 101
- ▶ Located in a rural residential setting
- ▶ Drinking water comes from the Laytonville County Water District although domestic wells are closer to the site and some may still be in use
- ▶ Homes are on septic

## LOCATION

- ▶ The landfill is in Long Valley, part of the Pacific Coast Mountain Range averaging 52 inches of rain per year with a winter wet season typical for the area.
- ▶ Terrain is hilly and wooded with a number of intermittent creeks flowing into Cahto Creek which runs into Ten Mile Creek then the South Fork of the Eel River.
- ▶ A history of forest products industry in the area and an older landfill to the northwest

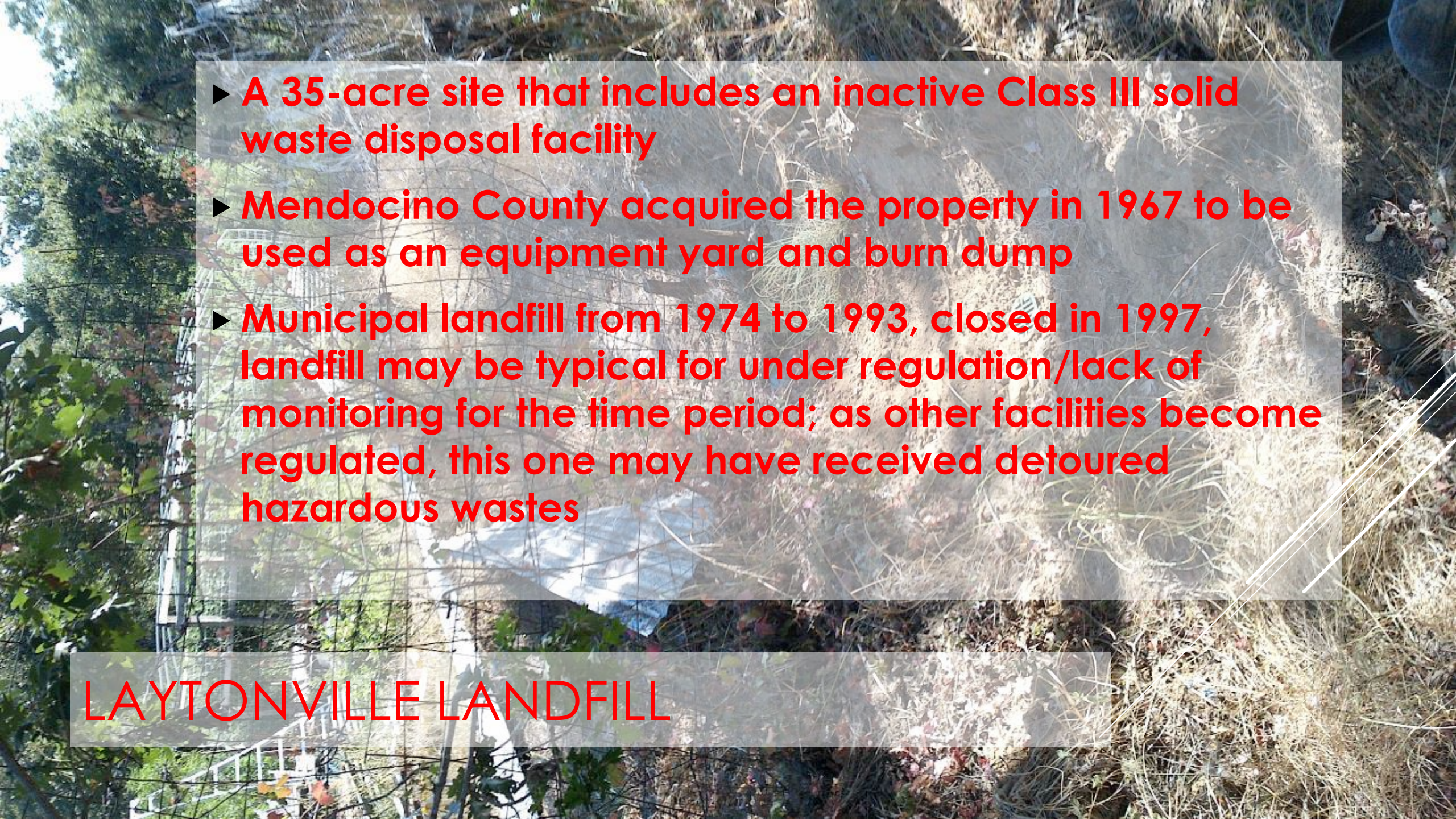
## SETTING



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- A photograph of a stream with a pink salmon in the water. The water is clear and flowing over rocks. The banks are covered with green and brown vegetation. A semi-transparent text box is overlaid on the image.
- Cahto Creek has supported salmon and eel migration and is important spawning and juvenile rearing habitat; the Tribe has completed a number of successful habitat restoration projects.
  - Groundwater from the area is from a fractured bedrock aquifer (Franciscan complex) with wells usually low yield.
  - A shallow alluvial aquifer is present at some locations but generally not practical for use.

## WATER RESOURCES



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- ▶ **A 35-acre site that includes an inactive Class III solid waste disposal facility**
  - ▶ **Mendocino County acquired the property in 1967 to be used as an equipment yard and burn dump**
  - ▶ **Municipal landfill from 1974 to 1993, closed in 1997, landfill may be typical for under regulation/lack of monitoring for the time period; as other facilities become regulated, this one may have received detoured hazardous wastes**

**LAYTONVILLE LANDFILL**



# SELECTED SITE VIOLATIONS

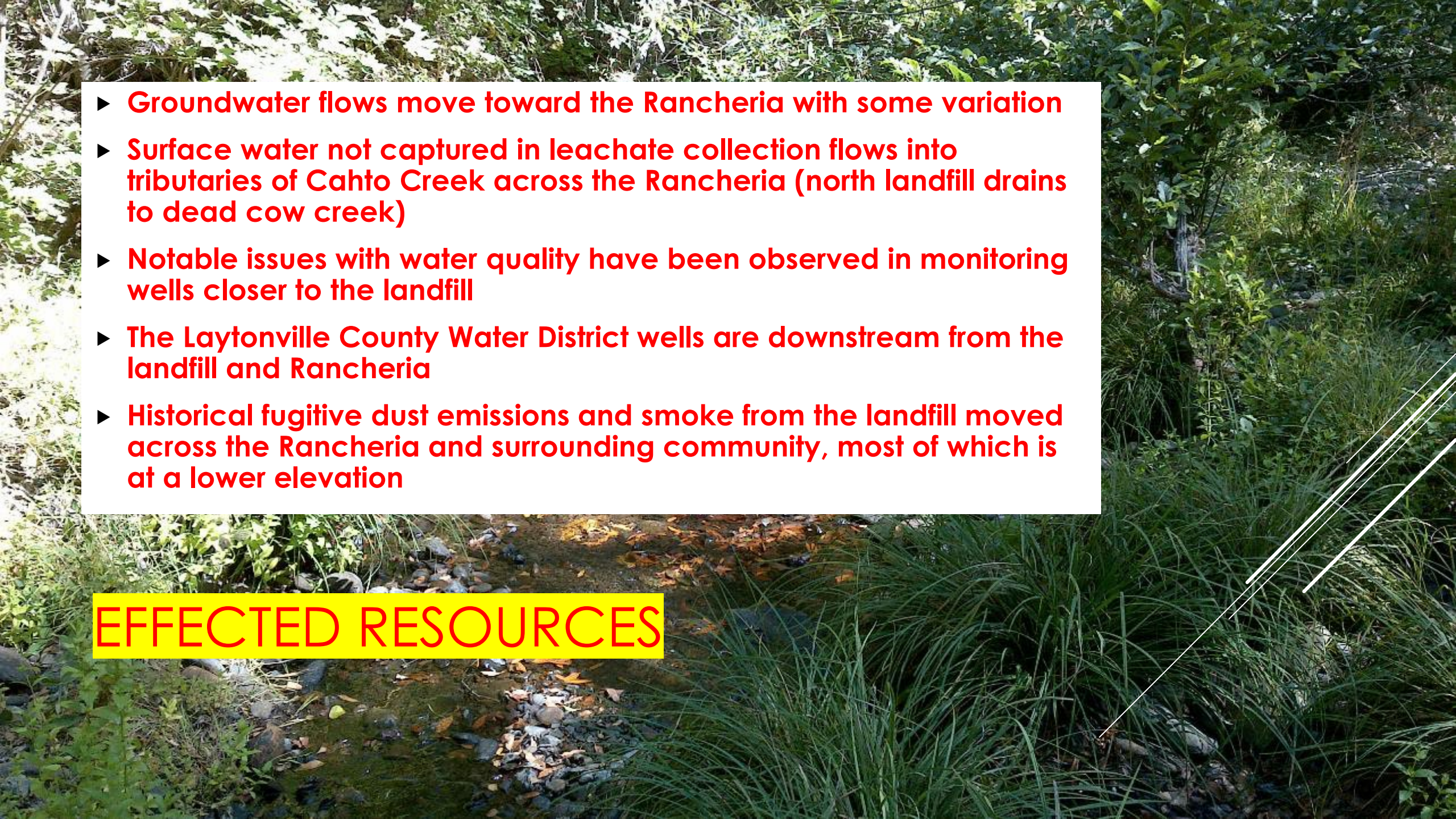
- **April 23, 1974**, Discharge of leachate into Cahto Creek creating a health hazard.
- **December 10, 1984**, Discharge to Cahto Creek from sedimentation ponds.
- **January 16, 1986**, A number of violations, including uncovered refuse, leachate seeps from the active face, erosion of slopes, litter accumulation, and neighbors/dogs entering the landfill to scavenge and salvage.
- **August 23, 1993**, An unauthorized covered trench roughly thirteen feet long and two feet wide containing contaminated soil with motor oil and diesel and was estimated to have been buried 7-10 years prior to the discovery of the trench.
- **June 18, 1997**, Burning of trash.
- **January 26, 2001**, Allegation of buried PCB laden transformers.
- **January 10, 2003**, Receiving hazardous materials and their release.
- **May 7, 2003**, Discharge of untreated leachate.



# Landfill Contaminants of Concern

Parameter	Source	Comments
<b>VOCs</b>	(Water Quality Technology, Inc., 2002) (Mendocino County Solid Waste Division, 2000)	Includes BTEX in groundwater and surface water
<b>Chlorinated solvents</b>	(Water Quality Technology, Inc., 2002) (Mendocino County Solid Waste Division, 2000) (Cayler, 2001)	Includes breakdown products such as vinyl chloride
<b>DDT</b>	(Water Quality Technology, Inc., 2002)	Limited testing
<b>Acetone</b>	(Water Quality Technology, Inc., 2002) (Mendocino County Solid Waste Division, 2000)	Acetone has been detected in surface water in recent Tribal monitoring
<b>Chromium, lead, zinc and nickel</b>	(Anderson Consulting Group, 1993)	From motor oil and diesel contamination
<b>arsenic, aluminum, chromium, titanium and lead</b>	(Miller, 2007)	Soil and surface water
<b>PCBs (transformers)</b>	(Cayler, 2001)	Buried onsite



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- ▶ **Groundwater flows move toward the Rancheria with some variation**
  - ▶ **Surface water not captured in leachate collection flows into tributaries of Cahto Creek across the Rancheria (north landfill drains to dead cow creek)**
  - ▶ **Notable issues with water quality have been observed in monitoring wells closer to the landfill**
  - ▶ **The Laytonville County Water District wells are downstream from the landfill and Rancheria**
  - ▶ **Historical fugitive dust emissions and smoke from the landfill moved across the Rancheria and surrounding community, most of which is at a lower elevation**

**EFFECTED RESOURCES**



- ▶ Tribe has been seeking better controls for the facility for decades including protests in the 1980s and 1990s prior to closure
- ▶ Facility includes leachate control features (discharge via truck to Willits water treatment plant)
- ▶ No liner, cap requires regular maintenance and improvements, no groundwater controls outside of leachate collection (modern Class III landfills are lined)
- ▶ Site monitoring data does not have an assessment objective and has been recently reduced
- ▶ There is uncertainty in the hydrological conceptual site model

## LAYTONVILLE LANDFILL



- ▶ The current Monitoring and Reporting Program is from 2018
- ▶ Last semi-annual report available at GeoTracker is 2022
- ▶ Managed by the County of Mendocino Department of Transportation, GeoLogic Associates consultant
- ▶ Oversight by North Coast Regional Water Quality Control Board
- ▶ Oversight by CalEPA (Calrecycle)
- ▶ Monitoring also by the Cahto Tribe Environmental Office, McGinnis and Associates consultant

## AGENCY AND RESPONSIBLE PARTIES



- ▶ Surface water analytes:
  - ▶ Chloride, total dissolved solids
  - ▶ VOCs and SVOCs as well as chlorinated solvents
- ▶ Groundwater analytes include:
  - ▶ Metals; aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, silver, sodium, thallium, titanium, tin, vanadium and zinc
  - ▶ VOCs, SVOCs, PCBs
  - ▶ TDS, CaCO<sub>3</sub>, COD
- ▶ Limited gas monitoring

## HISTORIC LANDFILL MONITORING PROGRAM (LARGEST DATA SET)

- ▶ Methane (only gas monitored) ranged from non detect to 2%
- ▶ Barium increasing at one location
- ▶ Conductance increasing at 2 deeper wells
- ▶ Acetone detections were noted
- ▶ Groundwater Flow was to the northeast (deeper) and northwest (shallow)

## 2022 MONITORING REPORT BY THE COUNTY



- ▶ Activities
  - ▶ Collect quarterly data from Tribal monitoring well system
  - ▶ Collect quarterly stream data when water is present with targeted dates to collect storm flows and baseflow
  - ▶ Collect first of season and late season stormwater samples
- ▶ Limits
  - ▶ Determining realistic COCs/risk drivers from the landfill
  - ▶ Lack of deeper monitoring wells
  - ▶ Coordination with state and county
  - ▶ Inconsistent funding and staffing limitations

# TRIBAL MONITORING PROGRAM

- ▶ BIA conducted soil sampling across the Reservation and found hexavalent chrome at/above screening levels
- ▶ US ACE and BIA sampled in drainages near the site, findings included low levels of dioxins
- ▶ All studies are limited in scope
- ▶ Studies near the site may have been sampling eroded cap material
- ▶ Poor record keeping limits reviews of data
- ▶ A soil sampling program for the Rancheria has been funded through CalEPA Environmental Justice programs.

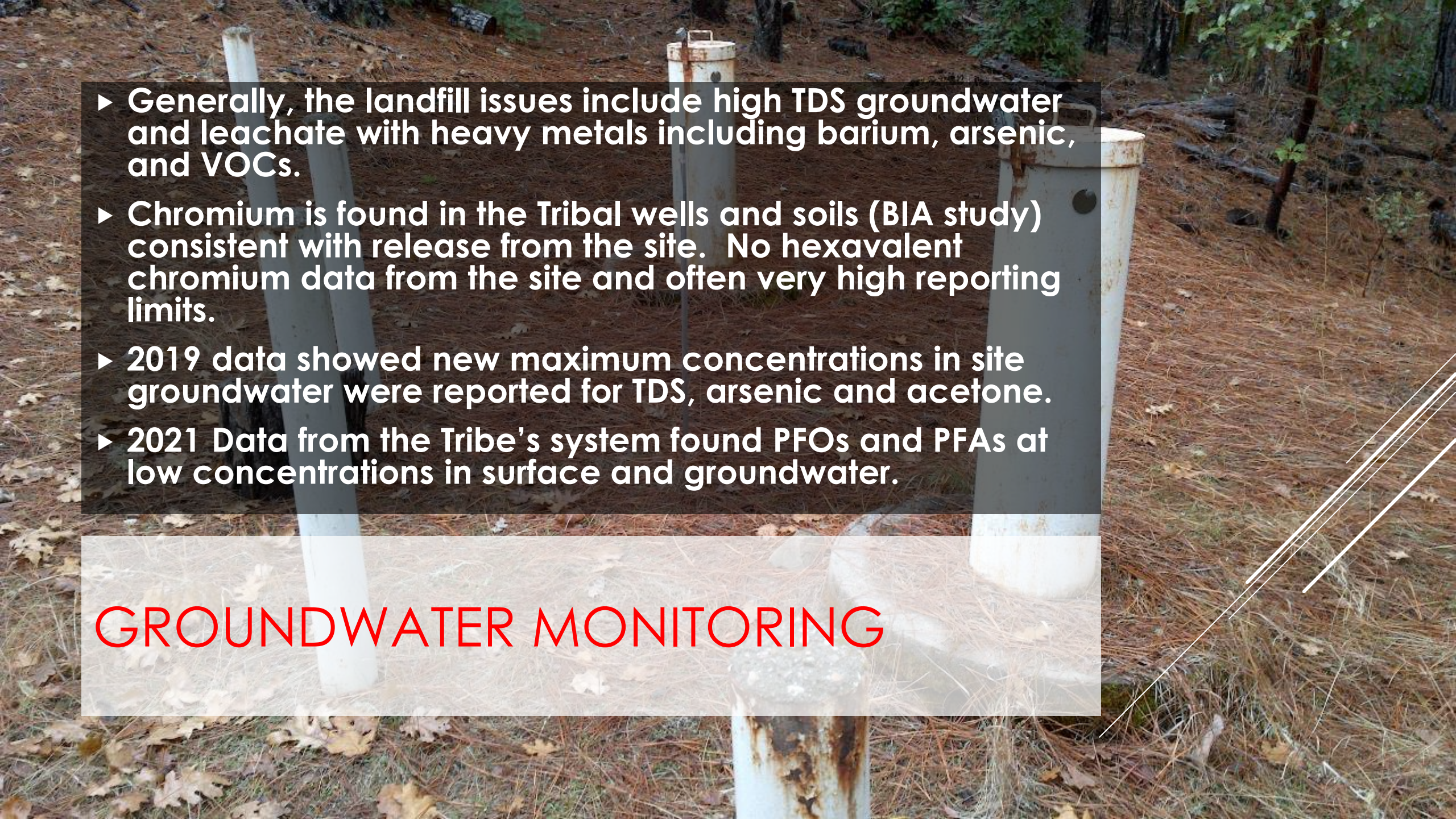
## HISTORIC SOIL SAMPLING



- ▶ Soil sampling for dioxins and metals has been done at the site surface soils
- ▶ Tribal soil sampling is in progress
- ▶ No soil sampling planned for the community
- ▶ Issues with some parameters have been noted but do indicate other pathways may be more significant

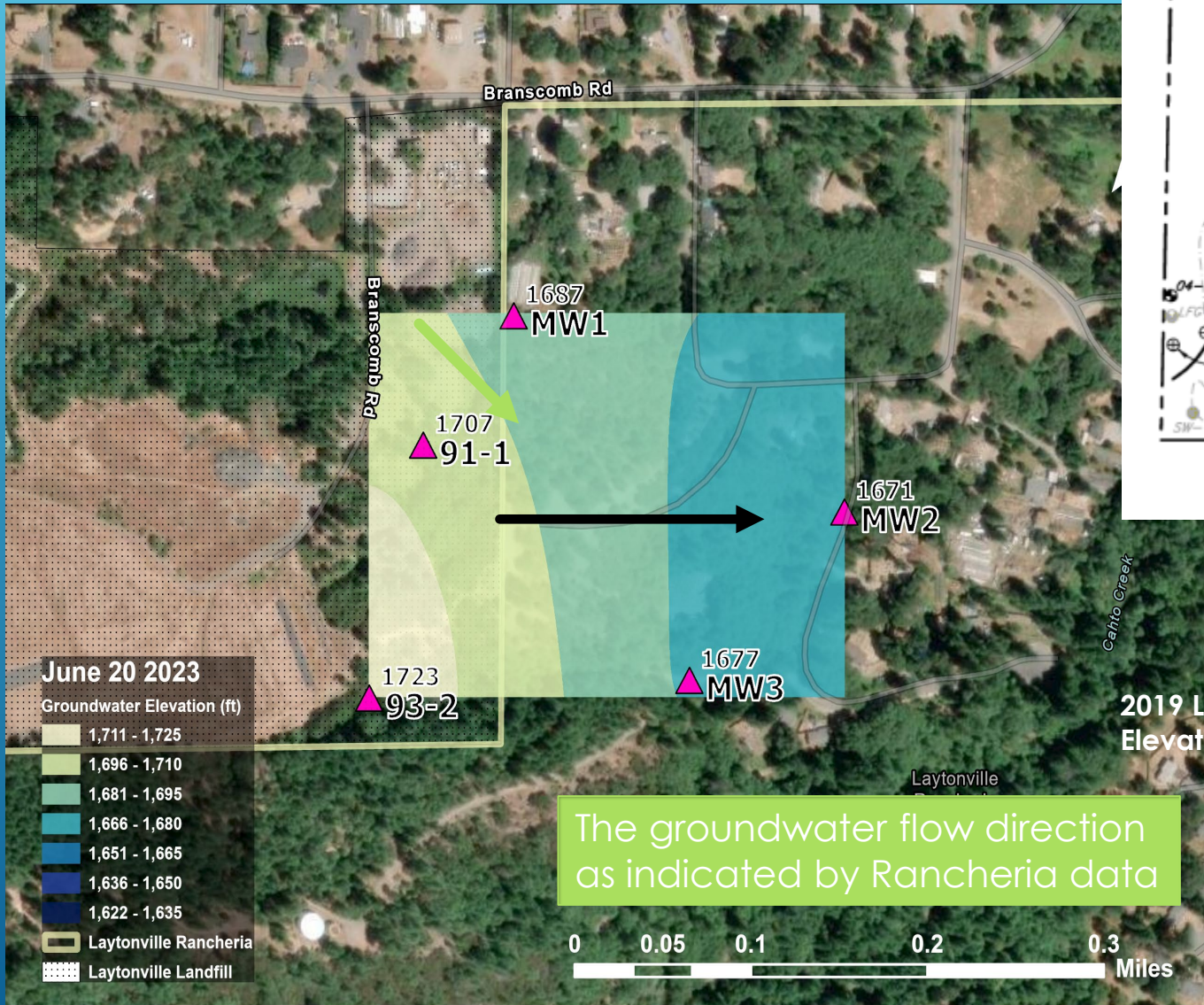
## SOIL SAMPLING SUMMARY



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- ▶ Generally, the landfill issues include high TDS groundwater and leachate with heavy metals including barium, arsenic, and VOCs.
  - ▶ Chromium is found in the Tribal wells and soils (BIA study) consistent with release from the site. No hexavalent chromium data from the site and often very high reporting limits.
  - ▶ 2019 data showed new maximum concentrations in site groundwater were reported for TDS, arsenic and acetone.
  - ▶ 2021 Data from the Tribe's system found PFOs and PFAs at low concentrations in surface and groundwater.

## GROUNDWATER MONITORING



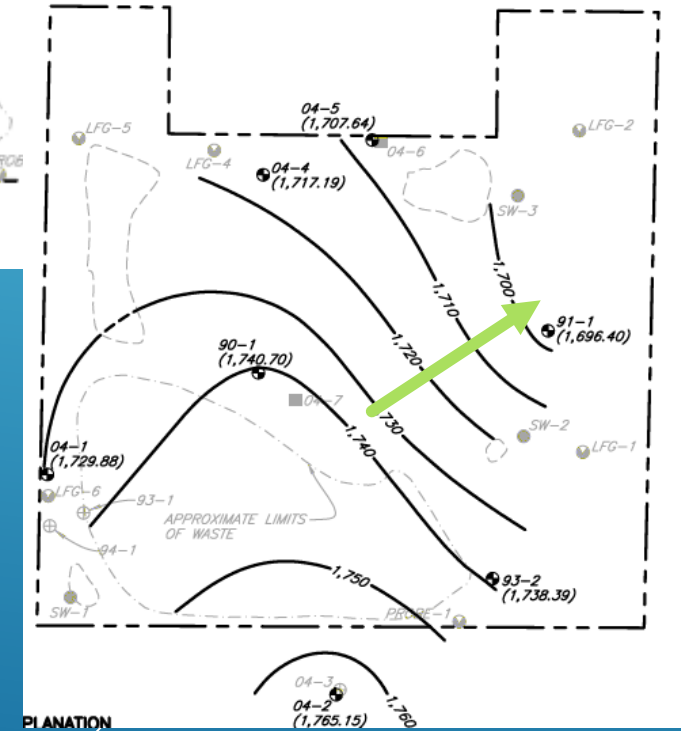


The groundwater flow direction as indicated by Rancheria data

2019 Landfill Groundwater Elevations, "Franciscan Wells"

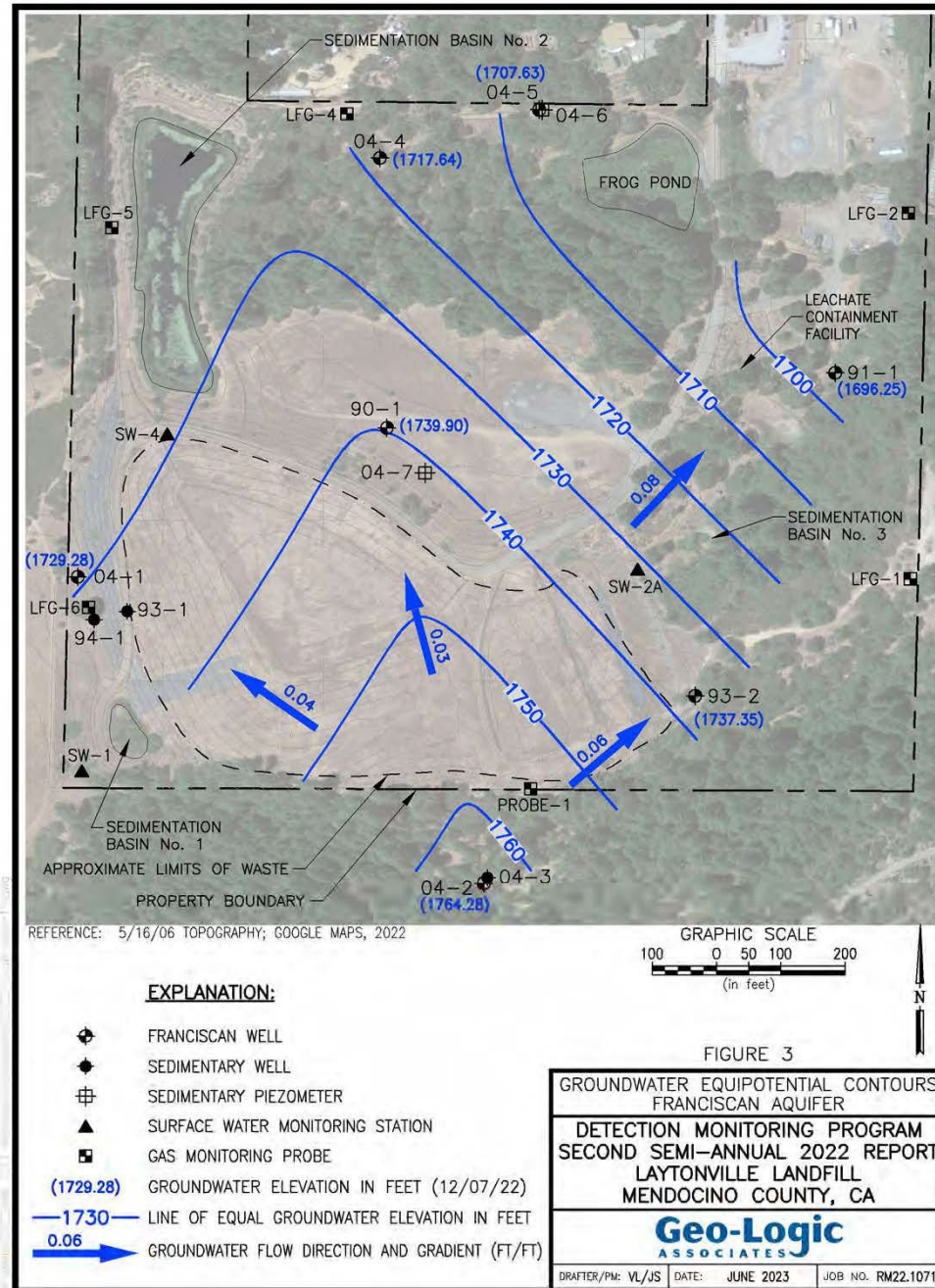


Groundwater flow direction as indicated in landfill site reports



PLANATION







- ▶ Elevated TDS, sulfate, chloride, fluoride
- ▶ Arsenic, chromium (below MCLs)
- ▶ VOCs/acetone(only VOCs monitored)
- ▶ Other VOCs including benzene and chlorinated solvents have historically been detected along with lead and other metals
- ▶ A 2018 DTSC study screened groundwater for dioxin, none was detected

ELEVATED IN CURRENT  
GROUNDWATER SITE DATA

- ▶ The groundwater flow direction as indicated in landfill site reports does not agree with the Rancheria data, likely a Conceptual Site Model (CSM) issue (dividing the wells into inappropriate groups)
- ▶ Local well logs do not agree with the CSM
- ▶ The groundwater well design appears to disregard local groundwater use and nearby well design
- ▶ Releases to groundwater appear to be occurring on the Rancheria
- ▶ Groundwater flow appears to be from the landfill site toward Cahto Creek

## GROUNDWATER CONDITIONS



- ▶ Additional wells onsite (RWQCB requested an additional well)
- ▶ Sample groundwater offsite including residential wells
- ▶ Review the analytical list – SVOCs might be required, and acetone is likely not a laboratory artifact
- ▶ Modernize sampling methods, update the conceptual hydrological model

# GROUNDWATER RECOMMENDATIONS

- ▶ Soil gas is monitored for methane, 2% max in 2022 report
- ▶ In 2021 Toluene, Trichlorofluoromethane, tetrahydrofuran and others detected (max for site history)
- ▶ Early 2022 study by CARB found Benzene at 38% of the Referenced Exposure Level with toluene at 12% near the site.
- ▶ Methane highest near a well known to be venting

## AIR QUALITY



- ▶ Biggest data set is for the site and soil gas (below ground)
- ▶ The site is intentionally vented to prevent a build up of methane
- ▶ Only one community sampling event in 2022, VOCs are below but approaching standards
- ▶ The community needs permanent air quality monitoring that includes VOCs

## AIR QUALITY RECOMMENDATIONS

- ▶ Informal health assessment conducted by the Tribe and Green Action Network found cancer rates on the Reservation at 5 times state rates
- ▶ 2005 Agency for Toxic Substances Disease Registry (ATSDR) Public Health Assessment Found inadequate data

## HEALTH CONCERNS OF RESIDENTS



- ▶ The landfill has released to offsite groundwater
- ▶ The landfill has released to offsite surface water
- ▶ Groundwater under the landfill is degrading
- ▶ Releases include organic and nonorganic components
- ▶ The monitoring program requires updates such as 1,4-dioxane

## CONCLUSIONS

- ▶ Groundwater monitoring will need to be expanded to include offsite wells to define the current landfill contaminant groundwater plume
- ▶ The Conceptual Site Hydrological model will need to be updated to meet current data
- ▶ The groundwater program requires updated to more modern sampling methods
- ▶ Additional soil assessment is required to assess this pathway
- ▶ Air quality monitoring is needed for the community

## CONCLUSIONS



- ▶ The community needs better outreach
  - ▶ County and state to address community concerns
  - ▶ Support collection of community data
- ▶ Data collection should support a site-specific risk assessment
- ▶ Update regulation to match site conditions
  - ▶ Can the county support needs/Superfund
  - ▶ Is the county activity seeking support beyond meeting requirements
  - ▶ Are state regulators directing the county for the best response

## RECOMMENDATIONS

- ▶ County Supervisors
  - ▶ Your elected representative for the county
  - ▶ Closest representative to operations at the landfill
- ▶ California State Assembly and Senate
  - ▶ The elected representative to ask questions about CalEPA
  - ▶ Closest representative to regulation of the landfill

*This is a state lead site, EPA does not have a role unless the site is evaluated for Superfund*

## RECOMMENDATIONS



QUESTIONS

