

Unlocking The Black Box

Effective Strategies to Identify and Preserve Archaeological Resources



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The Black Box: Hidden Cultural Resources

- **What do archaeological sites and icebergs have in common? Unforeseen constraints and planning dangers!**
 - **Horizontal extent below the ground surface and artifacts**
 - **Varying vertical deposit depths**
 - **Evidence of prior disturbance**
 - **Unexpected discoveries during construction**
 - **Increased anxieties as we navigate the straits of project approval**
 - **Increased potential (and cost!) for damaging discoveries during construction**

Planning Challenges from Poor Site Boundary Characterization

- **Lack of Design Constraint Data**
- **Inability to Effectively Engage Stakeholders (e.g., Native Californians)**
- **Imprecise Impact Assessment**
- **Impossible to Fully Establish Project Consistency with Avoidance Policies in Local General Plans, Coastal Plans, and Coastal Act**
- **Less Confident Determination of Real Project Implementation Costs (i.e., mitigation through construction monitoring)**

Extended Phase 1 Investigation Traditional Strategies

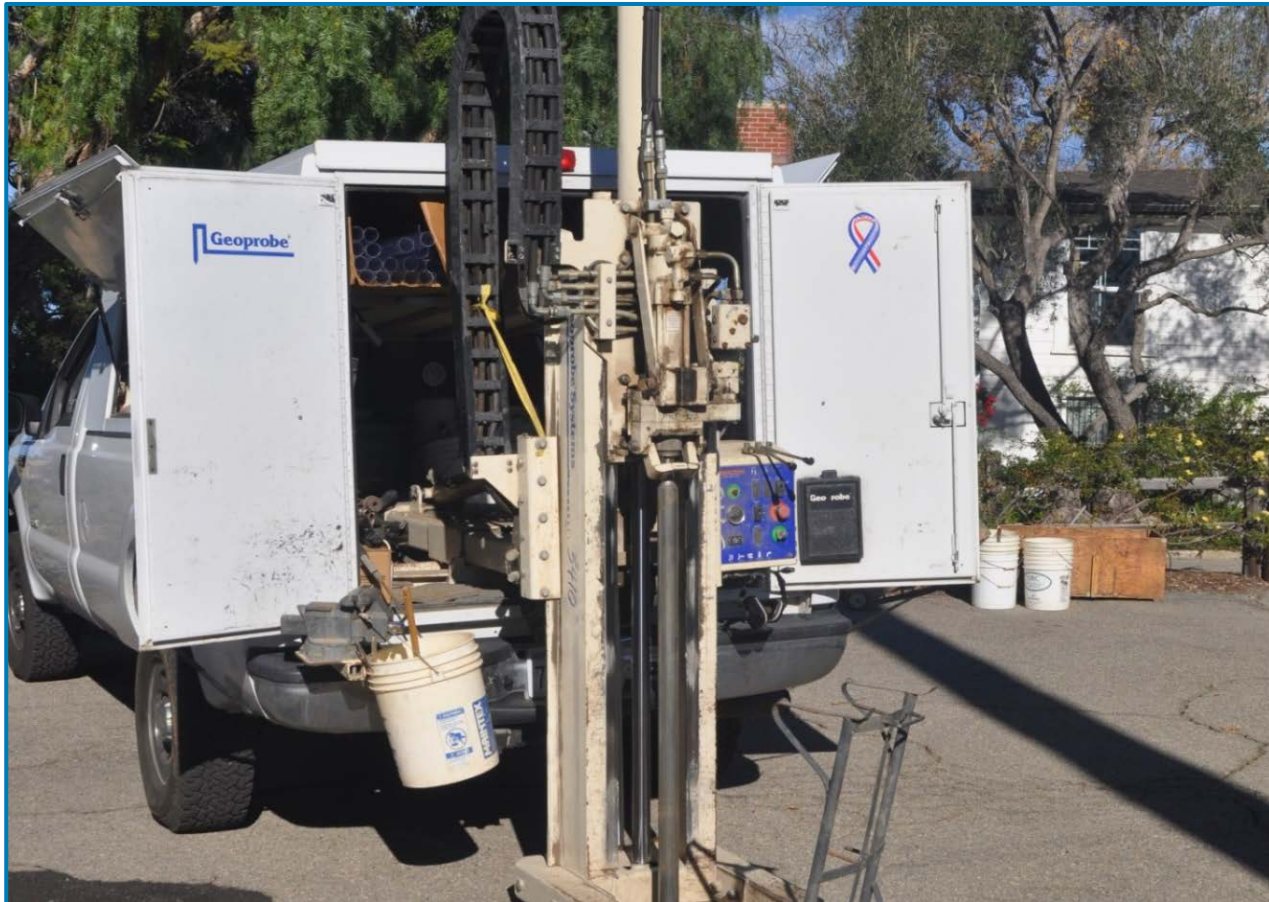
- **Hand Excavation: Shovel Test Pit (STP)**
 - Intrusive: 12-inch to 18-inch wide exposures
 - Relatively slow and requires large crew
 - Limited to depths of 3+ feet
 - Requires substantial repair of paving in urban settings

- **Mechanical Excavation – Backhoe Trenching**
 - Intrusive:– 24-inch wide minimum exposures
 - Faster than STPs, but much less control
 - Limited to depths of 5+ feet
 - Requires substantial repair of paving in urban settings

Extended Phase 1 Investigation the Geoprobe Alternative

■ Advantage, Geoprobe!

- Minimally Intrusive: 2-inch diameter cores
- Relatively fast and requires small crew
- Unlimited depths can be explored (50 feet or more).
- Requires minimal repair of paving in urban settings
- Allows for continuous inspection of soil as a core, unlike the STP and Backhoe Trench exposed profile
- Ideal context for evaluating extent of disturbance by geomorphologist with real-time results, rather than waiting for complete excavation to reveal stratigraphy



Geoprobe Rig

Your Familiar 1-Ton Pickup Truck Fits in a Large Parking Space



Geoprobe Core Sleeve

2-Foot Long Segments Driven Hydraulically from Truck Mount



Recovered Completed Geoprobe Core Segment
Soil Changes Easily Identified



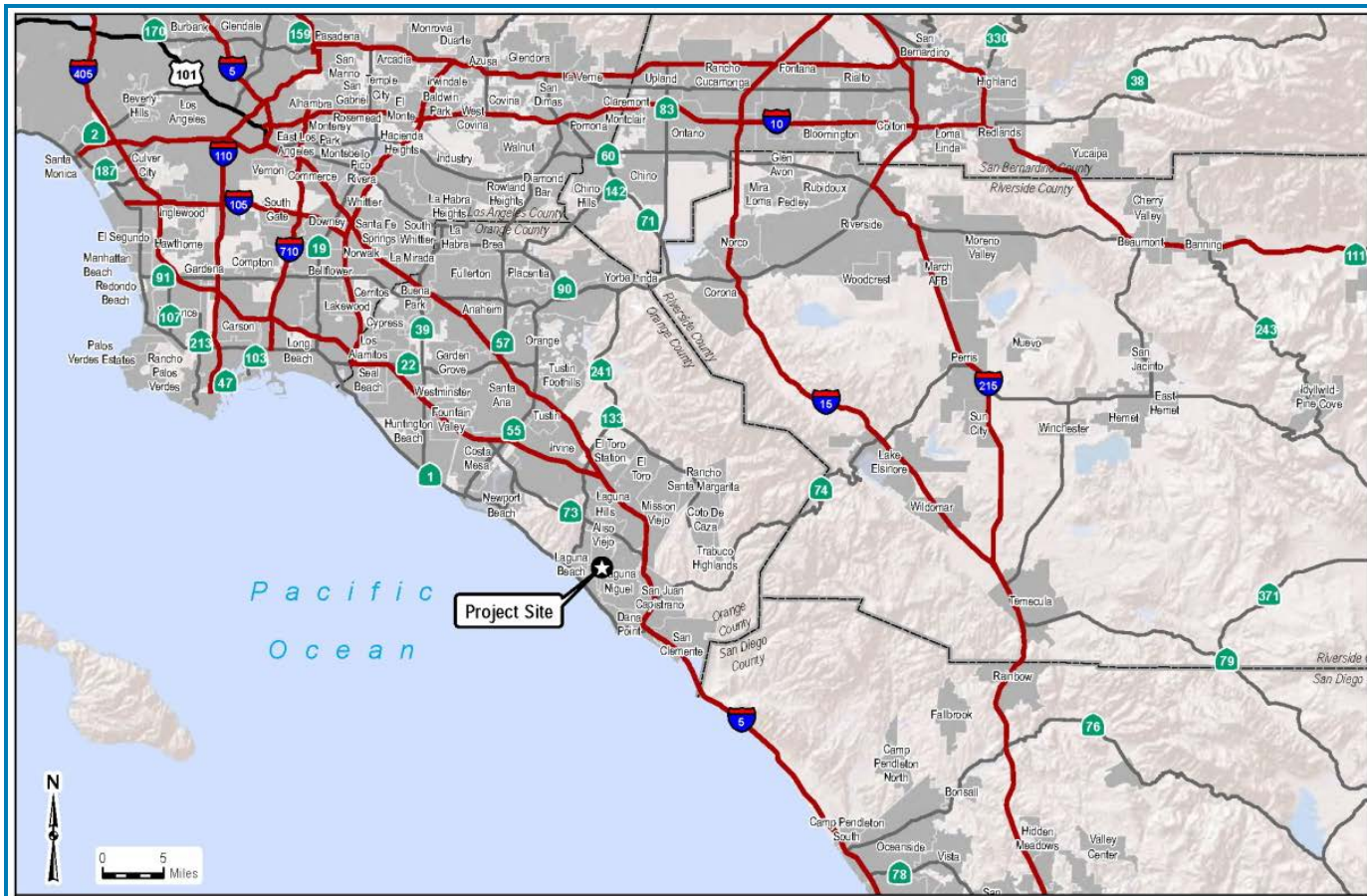
Screening of Cultural Materials

Recovered from Geoprobe Core Segments



Geomorphological Analysis

Determines Integrity of Site Soils (Disturbance)



Geoprobe Solution No. 1

SOCWA Coastal Treatment Plant Export Sludge Force Main Replacement Project



South Orange County Wastewater Authority (SOCWA) Sludge Force Main Replacement Project

Challenges:
Narrow Aliso Creek Corridor;
Potential for Buried Archaeological Deposits



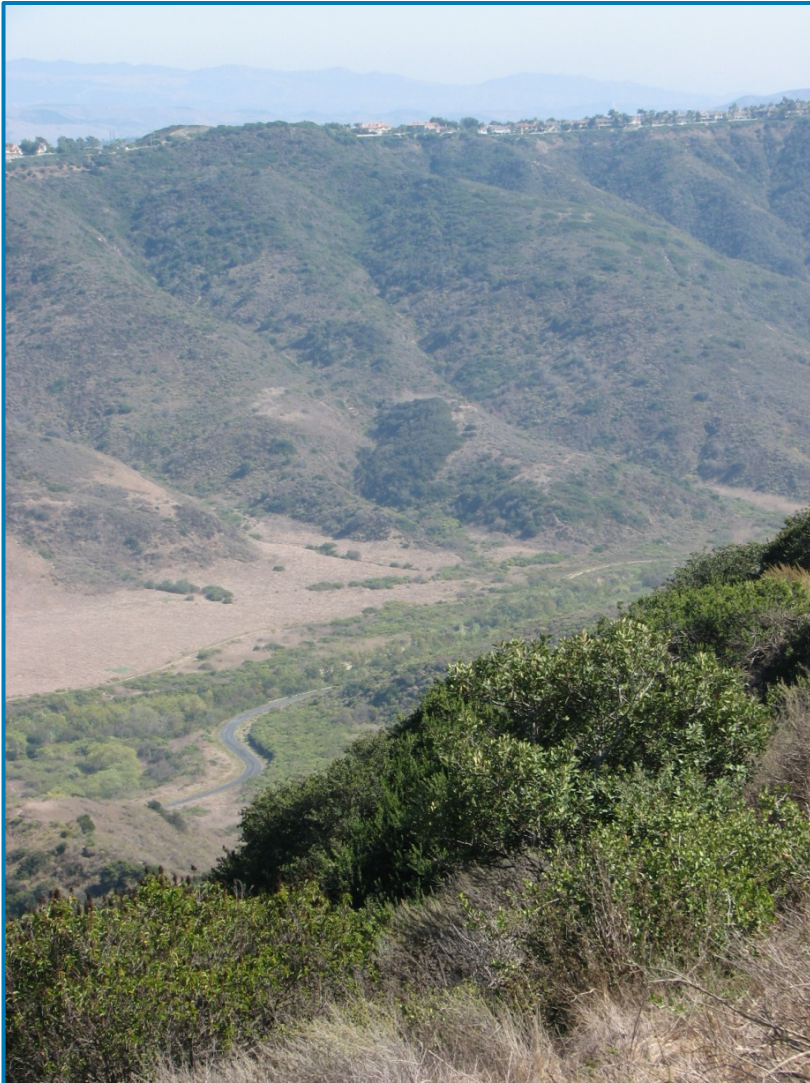
SOCWA Project Area



SOCWA Project Area



SOCWA Project Area



SOCWA Project Area

SOCWA Geoprobes Challenges

- **Two Prehistoric Sites on Edge of Aliso Creek**
- **CA-ORA-581**
 - Temporary camp, shellfish and stone tool scatter.
 - Recorded in 1975 with poor mapping, documentation.
 - Previous backhoe trenching associated with impact assessment, but unclear documentation of results.
 - No site boundary defined, no idea of depth
- **CA-ORA-582**
 - Rock shelter with prehistoric camping refuse.
 - Human remains identified during test units.
 - Site boundary ambiguous, possibly exaggerated.

SOCWA Geoprobes Success Strategies

■ CA-ORA-581

- Six geoprobes excavated within force main corridor within and adjacent to CA-OR-581 boundary, 11-feet deep.
- Only previously disturbed fill soils identified, clearing the way for conventional trenching.
- Juaneno Native Californians consulted and supportive.

■ CA-ORA-582

- Two geoprobes excavated within force main corridor on north and south sides CA-OR-581 boundary, 11-feet deep.
- Two feet of artificial fill, above intact soils without cultural deposit.
- Enabled location of pipeline to surface on either side of archaeological deposit and avoid resource.



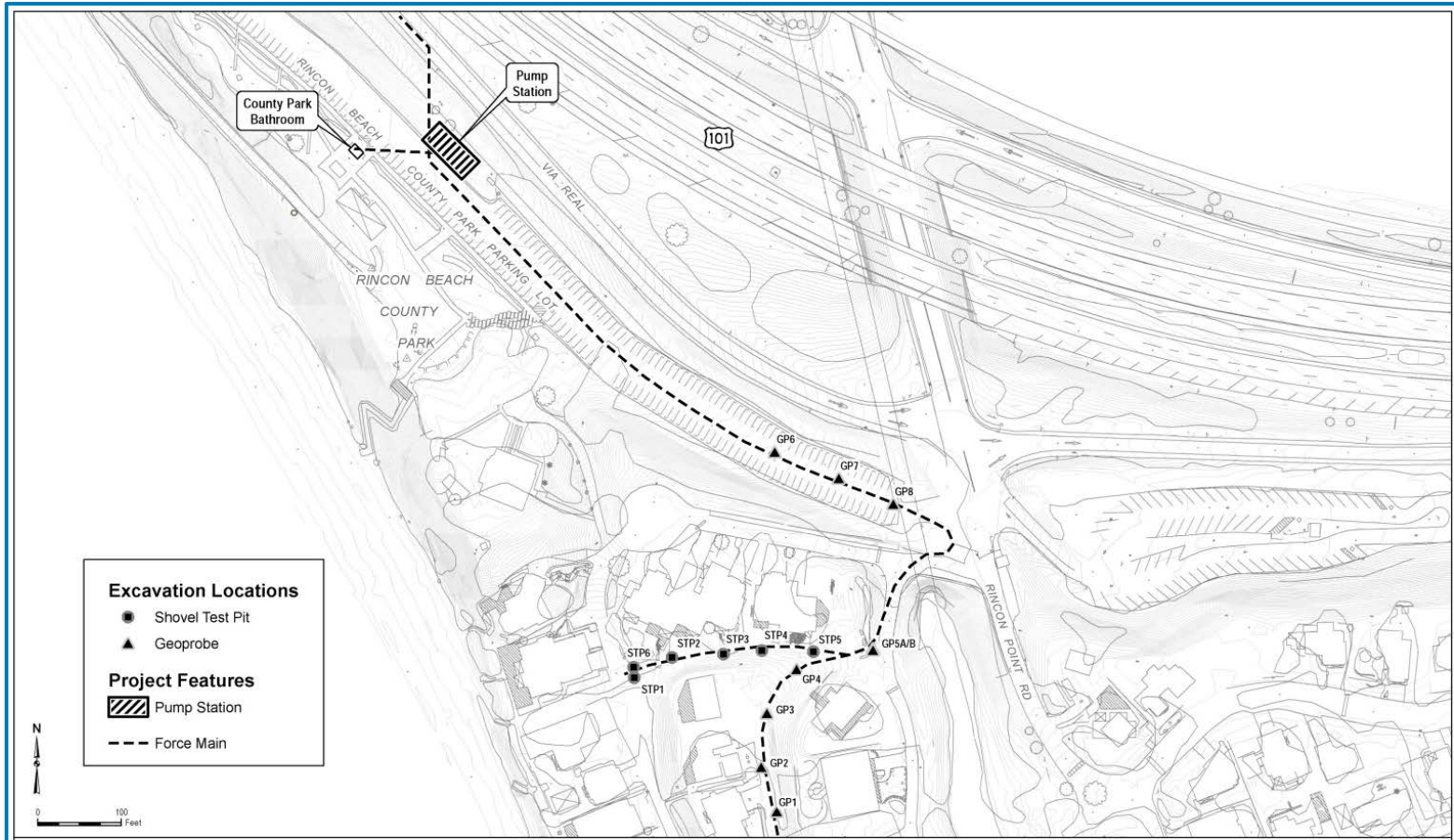
Geoprobe Solution No. 2

Carpinteria Sanitary District (CSD)
Rincon Point Septic to Sewer Conversion Project

CSD Geoprobes Challenges

■ CA-SBA-1 / CA-VEN-62

- Chumash Village of *Shuku*, an extremely sensitive site, including human remains
- Substantial but variable deposit depths of over 6 feet
- Sewer main corridor primarily within paved roadways
- Project site in contentious residential neighborhood
- Conventional engineering requires extremely deep trenching to achieve gravity flows, resulting in potentially devastating cultural resource impacts



Carpinteria Sanitary District (CSD)

Rincon Point Septic to Sewer Conversion Project Geoprobe Locations

CSD Geoprobes Success Strategies

■ CA-SBA-1

- Five geoprobes within the paved Rincon Point Road to 14 feet
- Three geoprobes within the Rincon Beach County Park parking lot.
- Five STPs in pathway where geoprobe equipment inaccessible.
- Negative results in several locations where site boundary was previously defined.
- Previously disturbed areas containing redeposited cultural material that are not considered significant.
- Buried archaeological deposits that could be avoided by the use of directional drilling below the sensitive soils.

Geoprobes Native American Perspectives

- Archaeological Site Avoidance and Preservation are of Highest Priority
- Determination of Previous Disturbance is Important, but Interpreted Differently within Native California communities.
- Identification of Cemeteries vs. Isolated Burials Extremely Challenging.
- Geoprobes minimize damage to an archaeological site during environmental impact assessment, pre-approval. Favored approach.

Geoprobes Coastal Policy Consistency

- Avoidance of archaeological sites, regardless of significance, is preferred policy.
- Demonstrating avoidance feasibility? Geoprobe data objective, comprehensive, easily understood (used in geological and soils assessments).
- Design and engineering clients appreciate ability to get fast results with minimal disruption to existing setting. They are familiar with the technique, so there is more confidence in the results.