

INFORMATION HANDOUT

MATERIALS INFORMATION

1. Foundation Report dated on 2/17/2010
2. Foundation Review dated on 8/22/2011
3. Geotechnical Design Report Union Valley Parkway dated 8/20/2009
4. Sound Wall Foundation Report dated 1/26/11
5. Abandoned oil pipeline disclosure
6. Site Investigation Report

Memorandum

*Flex your power!
Be energy efficient!*

To: RYAN STILTZ, CHEIF
Bridge Design Branch 10
Office of Bridge Design South 2
DIVISION OF ENGINEERING SERVICES
STRUCTURES DESIGN – MS 9 4/81

Date: February 17, 2010

File: 05-SB-101-83.1/83.9
Union Valley Pkwy OC
05-463801
Br. No. 51-0338

Attn: Renee Anderson
Project Engineer

From: DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES

Subject: Foundation Report

Scope of Work

A Foundation Report (FR) is provided for the above referenced project. The proposed project is located near the towns of Orcutt and Santa Maria in Santa Barbara County. Construction of an interchange with an overcrossing to carry Union Valley Parkway (UVP) over SR 101 is proposed. Improvements are proposed to provide access to SR 101 via UVP, which is classified as a major arterial for the community. Construction of the interchange is also intended increase the levels of service at the adjacent SR 101 interchanges, Clark Avenue to the south and South Santa Maria Undercrossing to the north. A General Plan showing a preferred alternative was provided by Design. Review of published geologic data and previous geotechnical reports, field reconnaissance, and design calculations were performed as part of the geotechnical investigation. This Foundation Report supercedes the Preliminary Foundation Report for the Union Valley Parkway OC dated October 8, 2009.

The purpose of this report is to document geotechnical conditions and provide foundation recommendations.

Project Description

SR 101 through the project limits is classified as a principal arterial. The existing roadway trends to the northwest/southeast and is a four-lane divided freeway with 12-foot lanes, 2-foot inside shoulders, 8-foot outside shoulders and an unpaved median. The roadway was constructed on cut and fill slopes graded to 2:1 (H:V). Agricultural lands border SR 101 to the east and county property separates a residential development from the right of way to the west. Morningside Drive, a paved frontage road, parallels the northbound lanes to the north of the proposed interchange then becomes unpaved and turns to the east in the approximate area of the proposed

east abutment of the overcrossing. Eastbound UVP dead-ends approximately 500 feet west of SR 101 at the intersection of UVP and Boardwalk Lane. A CMU soundwall parallels the southbound lanes and tapers to the southwest before terminating to the north of the proposed west overcrossing abutment.

The General Plan provided by Design shows a skewed two-span overcrossing bridge supported on Class 140 piles with (3) bent columns. Refer to the attached General Plan for details. Construction of the approach embankment to the west of SR 101 has been started as part of a previous project and will be partially utilized as the approach embankment for the proposed structure. An approach embankment will be constructed at the east abutment. NGVD29 elevation datum is used throughout the project plans and to reference top of boring elevations to the plans.

Pertinent Reports and Investigations

The following publications were used to assist in the assessment of site conditions:

1. *Draft Geotechnical Design Report*, EA 05-463801, Caltrans, Brandon Badcker, 2009.
2. *Geologic Hazards Report Union Valley Interchange*, EA 05-463800, Caltrans, 1999.
3. *Preliminary Geotechnical Report Union Valley Interchange*, EA 05-463800, Caltrans, 2002.
4. *Geologic Map of California, Santa Maria Sheet*. California Division of Mines and Geology, C.W. Jennings, 1959.
5. *Preliminary Foundation Report*, EA 05-463801, Caltrans, Ryan Turner, 2009.

Physical Setting

The project is located in the Santa Maria Valley ecological subsection of the Central California Coast. The mean annual precipitation is between 12 and 15 inches and the mean annual air temperature is 57° F. The climate is hot and sub-humid and is affected by the marine influence, with morning fog often present in the summer months.

The main drainage feature in the region is the Santa Maria River to the north of the project, which is dry for most of the year but swells during winter storms. Swales, drop inlets, and culverts currently manage surface drainage in the vicinity of the proposed overcrossing. No streams or rivers lie within the project extents.

Field Investigation and Laboratory Testing

Three mud-rotary borings were drilled at the site to determine the subsurface conditions at the proposed foundation locations. In-situ soil strength parameters were determined using the Standard Penetration Test (SPT) for cohesionless soils. No significant layers of cohesive soils were encountered in the borings. Laboratory tests were used to determine the particle size distribution and corrosion potential of representative samples obtained at depth.

Site Geology and Subsurface Conditions

Geology

The region falls within the Coast Ranges geomorphic province of California. Northwest trending mountains bordering the Pacific Ocean characterize the province. The project site is located at the foot of the Coast Ranges in the Santa Maria Valley between the mountains and the ocean. Quaternary aged dune sands are shown on the geologic map for the area. Fine to medium grained sands were encountered during construction of the adjacent Clark Avenue and South Santa Maria Undercrossing interchanges and are exposed in cut slopes within the project extents. Similar soils were encountered during the subsurface investigation.

Subsurface Conditions

Field observations, in-situ sampling, and laboratory testing indicate that the site is underlain by 50-60 feet of medium dense to very dense poorly-graded dune sands. The dune deposits are mostly fine to medium grained sands with trace non-plastic fines. Interbedded layers of silty sands, silts, clayey sands, and poorly-graded sands were encountered beneath the dune deposits to a depth of approximately 120 feet at the bottom of the borings.

Groundwater

Open observation wells were installed in borings R-09-001 and R-09-003 to observe fluctuations in groundwater levels and determine if groundwater will influence construction and foundation design. Results of the groundwater-monitoring program are summarized in Table 1.

Table 1. Groundwater Elevations

Boring	Date	Groundwater Elevation(ft)
R-09-001	12/28/2009	411.9
R-09-003	12/28/2009	413.0
R-09-001	1/25/2010	412.0
R-09-003	1/25/2010	413.0

Scour Evaluation

There is no potential for scour at this site.

Corrosion Evaluation

The Department considers a site to be corrosive to foundation elements if one or more of the following conditions exist for the representative soil and/or water samples taken at the site: pH of less than 5.5, chloride content greater than 500 ppm, or sulphate content greater than 2000 ppm. Soil samples were obtained in each of the three borings and sent to the District 5 Geotechnical Laboratory for corrosion potential evaluation. Based on the results of the corrosion analyses, the site is considered to be corrosive. Protection of foundation elements should be considered. Refer to the table below for complete corrosion testing results.

Table 2. Corrosion Testing Summary

<i>Boring ID</i>	<i>Depth (ft)</i>	<i>pH</i>	<i>Resistivity ohm-cm</i>	<i>Chloride ppm</i>	<i>Sulphate ppm</i>	<i>Corrosive</i>
R-09-001	6.9-10.4	5.28	9500	-	-	YES
R-09-001	15.4-20.4	7.02	7300	-	-	NO
R-09-001	25.4-30.4	7.00	6200	-	-	NO
R-09-001	35.4-40.4	7.35	6800	-	-	NO
R-09-001	45.4-50.4	7.47	5300	-	-	NO
R-09-001	66.9-70.4	6.88	5400	-	-	NO
R-09-001	86.9-90.4	6.78	4100	-	-	NO
R-09-002	15.5-20.0	7.15	9500	-	-	NO
R-09-002	36.5-40.0	7.13	7650	-	-	NO
R-09-002	66.5-70.0	6.77	8600	-	-	NO
R-09-002	81.5-85.0	6.88	4700	-	-	NO
R-09-003	5.2-11.7	7.70	8190	-	-	NO
R-09-003	25.2-31.7	8.00	6820	-	-	NO
R-09-003	35.2-41.7	7.90	7000	-	-	NO
R-09-003	55.2-61.7	8.00	8110	-	-	NO
R-09-003	80.2-86.7	7.60	6420	-	-	NO

Seismic Recommendations

Based on the 2009 Caltrans Seismic Design Procedure, the following active and potentially active faults are located within the vicinity of the project site. The Caltrans ARS Online Tool was used to develop ARS curves for deterministic and probabilistic seismic prediction models. An average shear wave velocity of 961 ft/sec (293 m/s) for the upper 100 feet of soil was estimated using correlations to the SPT and used to generate the ARS curves. The corresponding design envelope ARS curve is presented in figure 1. A basin factor of 1.0 was assumed for this location and a near fault factor was applied to the data due to the proximity of the faults. Curve data points are included as an attachment to this report.

Table 3. Active and Potentially Active Faults

<i>Fault Name</i>	<i>Fault Type</i>	<i>Moment magnitude of maximum credible earthquake</i>	<i>Distance from fault to project site (miles)</i>	<i>Peak ground acceleration (gravity)</i>
Casmalia	Reverse	6.5	2.5	0.40
Southern San Luis Range Fault Zone	Reverse	7.2	5.2	0.34

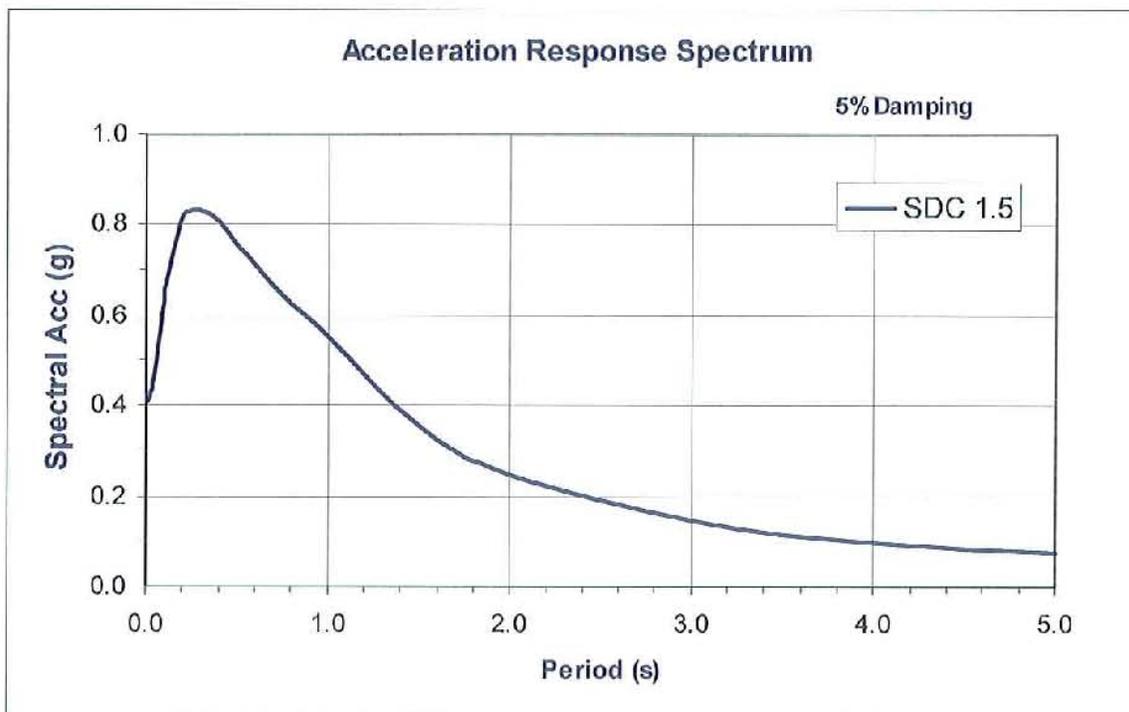


Figure 1. Design ARS Curve

Soils with a potential for liquefaction are saturated loose sands and gravels. Based on soil types encountered within the project limits, liquefaction potential is low due to dense soils and a low groundwater table.

As-Built Foundation Data

As-built foundation plans, details, and logs of test borings were available for the Clark Avenue and South Santa Maria Undercrossing bridges to the south and north of the project location. The Clark Avenue Overcrossing is founded on CIDH piles in sandy soils. The Santa Maria Way Undercrossing is founded on driven precast concrete piles in dune sands similar to those encountered at the Union Valley Parkway site.

Foundation Recommendations

Driven Displacement Piles

Class 140 driven displacement piles such as Standard Plan precast concrete piles, closed end pipe piles, or small diameter open-ended pipe piles are recommended for support of the new structure. It is assumed that open-ended pipe piles will plug during driving, behaving as a displacement pile. Open-ended pipe piles also allow for pre-drilling if hard strata are encountered before reaching the required driving depth. Piles will develop required axial resistance from skin friction and end bearing in the dune sand. Should the pile tip elevations required to meet lateral load demands exceed the specified pile tip elevations required for axial load demands presented in the following table, Geotechnical Design shall be contacted for further recommendations. Recommended pile tip elevations are provided in the tables below.

Abutment Foundations Design Recommendations									
Support Location	Pile Type	Cut-off Elevation (ft)	LRFD Service-I Limit State Load (kips) per Support		LRFD Service-I Limit State Total Load (kips) per Pile (Compression)	Nominal Resistance (kips)	Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
			Total	Permanent					
Abut. 1	Class 140	487.52	2200	1575	110	220	430(a), 430(c)	430	220
Abut. 3	Class 140	496.72	2200	1575	110	220	443(a), 443(c)	443	220

Notes:

- 1) Design tip elevations are controlled by: (a) Compression, and (c) Settlement
- 2) The specified tip elevation shall not be raised above the design tip elevations for tension, lateral, and tolerable settlement.

Bent Foundation Design Recommendations											
Support Location	Pile Type	Cut-off Elevation (ft)	Service-I Limit State Load per Support (kips)	Total Permissible Support Settlement (inches)	Required Factored Nominal Resistance (kips)				Design Tip Elevations (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance Required (kips)
					Strength Limit		Extreme Event				
					Comp. ($\phi=0.7$)	Tension ($\phi=0.7$)	Comp. ($\phi=1$)	Tension ($\phi=1$)			
Bent 2	Class 140	466.75	1770	1	264	0	105	0	431 (a-I) 446(a-II), 431 (c)	431	264

Notes:

- 1) Design tip elevations are controlled by: (a-I) Compression (Strength Limit), (a-II) Compression (Extreme Event), and (c) Settlement.
- 2) The specified tip elevation shall not be raised above the design tip elevations for tension, lateral, and tolerable settlement.

Pile Data Table						
Location	Pile Type	Required Nominal Resistance (kips)		Design Tip Elevation (ft)	Specified Tip Elevation (ft)	Nominal Driving Resistance (kips)
		Compression	Tension			
Abut. 1	Class 140	220	0	430(a), 430(c)	430	220
Bent 2	Class 140	264	0	431 (a-I), 446(a-II), 431(c)	431	264
Abut. 3	Class 140	220	0	443(a), 443(c)	443	220

Notes:

- 1) *Design tip elevations for Abutments are controlled by: (a) Compression and (c) Settlement.*
- 2) *Design tip elevations for Bents are controlled by: (a-I) Compression (Strength Limit), (a-II) Compression (Extreme Event), and (c) Settlement.*
- 3) *The specified tip elevation shall not be raised above the design tip elevations for tension load, lateral load, and tolerable settlement.*

Approach Fill Earthwork

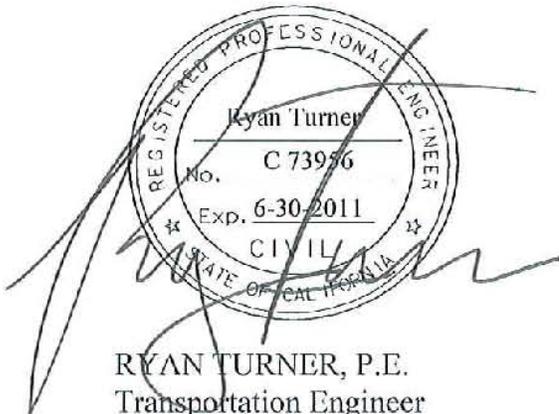
Fill slopes for the abutment approach embankments are recommended at a slope of 2:1 (horizontal: vertical). Existing cut and fill slopes at 2:1 in the project vicinity are performing suitably. If non-native soils are imported to construct the approach fills, laboratory testing shall be performed to ensure that soils meet the minimum requirements for backfill as required by the Standard Specification. Settlement of the approach fills and underlying bearing strata is expected to be immediate due to the absence of cohesive soils. Settlement was estimated using Hough's Method, which correlates SPT data to a bearing capacity factor used to calculate the amount of settlement. Total calculated settlement for Abutment 1 is 2.5 inches and calculated settlement for Abutment 3 is 2.5 inches. No fill delay period is required prior to pile installation.

Construction Considerations

Dense sands may limit the depth to which displacement piles can be driven. Pre-drilling of open-ended pipe piles may be required to advance piles to the required tip elevations.

Corrosive soils were encountered in the borings. Corrosion mitigation should be considered to protect the structure from damage.

If you have any questions or comments, please contact Ryan Turner at (805) 549-3750 or Michael Finegan at (805) 549-3194.



RYAN TURNER, P.E.
Transportation Engineer
Geotechnical Design – North
Branch D

MICHAEL S. FINEGAN, P.E., CHIEF
Geotechnical Design – North
Branch D

- c: Roy Bibbens / GDN Records
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Job File / Branch D Records
GS Corporate (email Mark_Willian@dot.ca.gov)
David Beard / Project Manager
Structure Construction RE Pending File (email RE_pending_file@dot.ca.gov)
Kelly Holden / DES Office Engineer
Andrew Tan / PCE
Douglas Lambert / DME

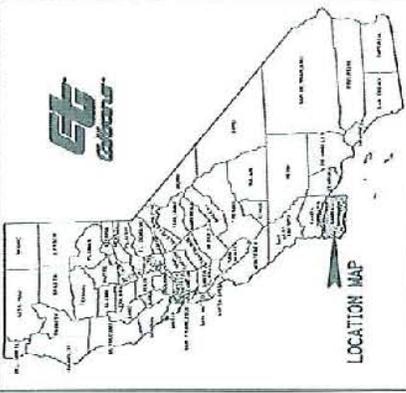
LIST OF ATTACHMENTS

Vicinity Map	Attachment 1
Geologic Map and Legend	Attachment 2
General Plan	Attachment 3
Design ARS Curve Data	Attachment 4
Foundation Design Data Sheet	Attachment 5

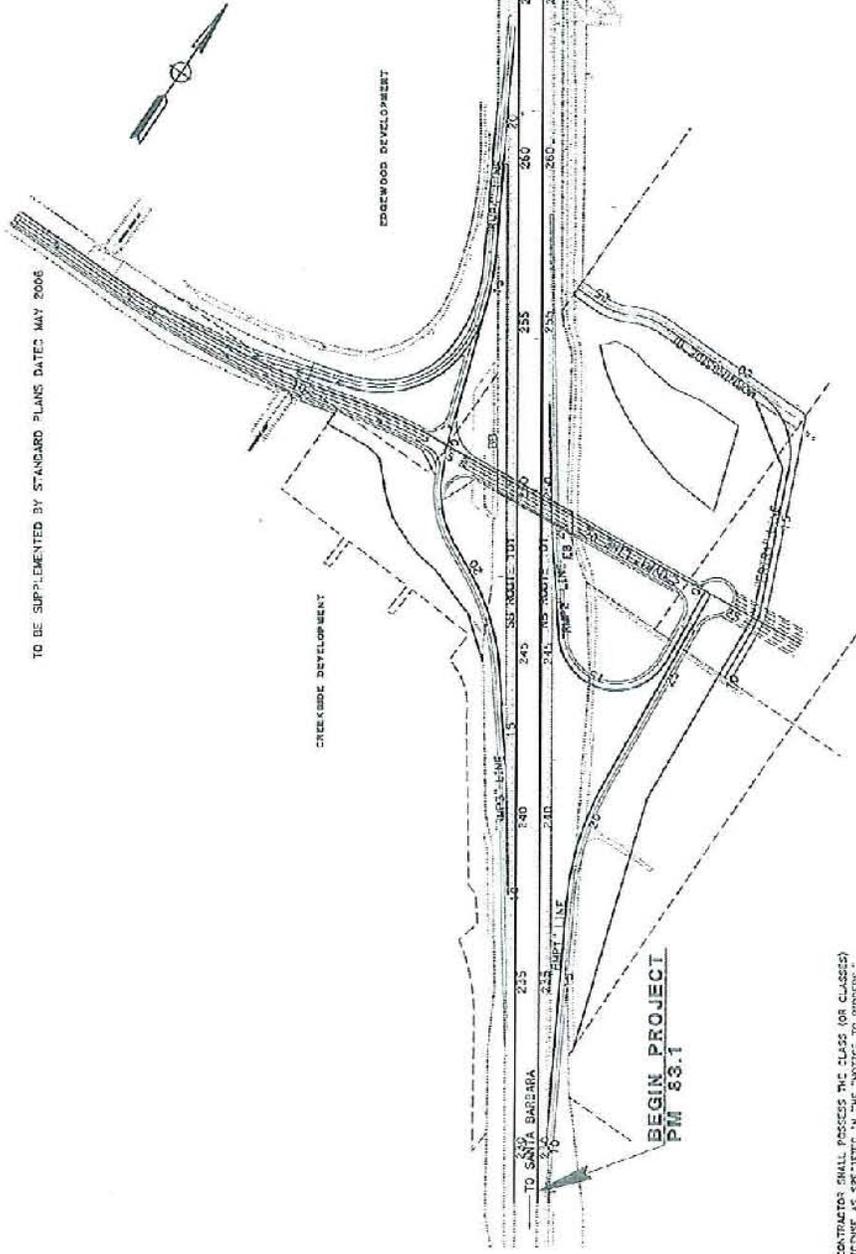
INDEX OF PLANS

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION PROJECT PLANS FOR CONSTRUCTION ON STATE HIGHWAY

Dist.	County	Route	Project No.	Sheet No.
05	SB	101	83.1/83.9	



TO BE SUPPLEMENTED BY STANDARD PLANS DATED MAY 2006



**BEGIN PROJECT
PM 83.1**

**END PROJECT
PM 83.9**

PROJECT ENGINEER: [Signature] DATE: []

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE: []

BY: [Signature]

REGISTERED CIVIL ENGINEER

CONTRACT NO. []

THE CONTRACTOR SHALL PROTECT THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

DESIGN ENGINEER: [Signature]

REGISTERED ENGINEER

CALTRANS WEB SITE: <http://www.dot.ca.gov/>

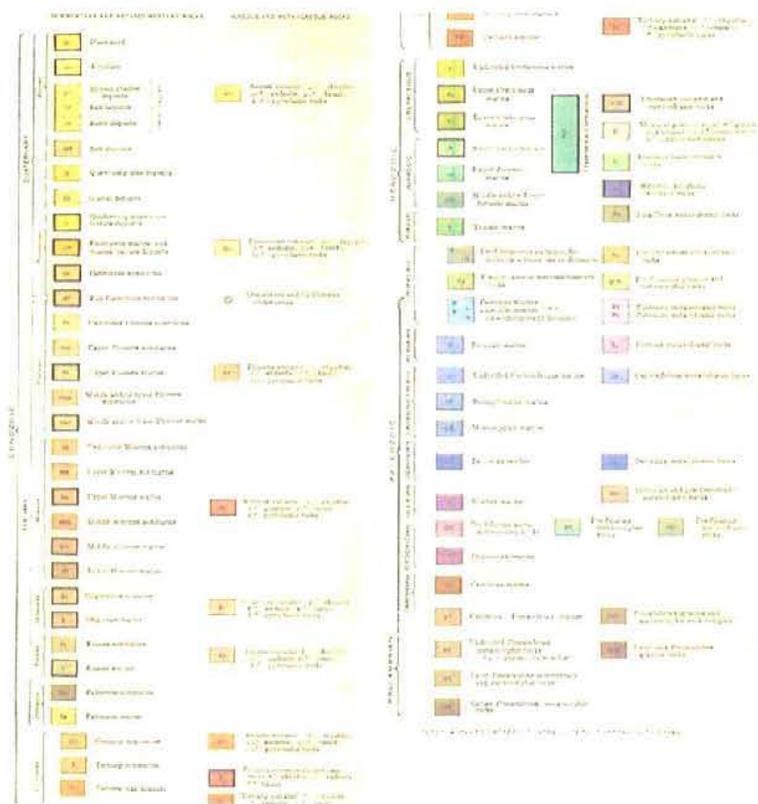
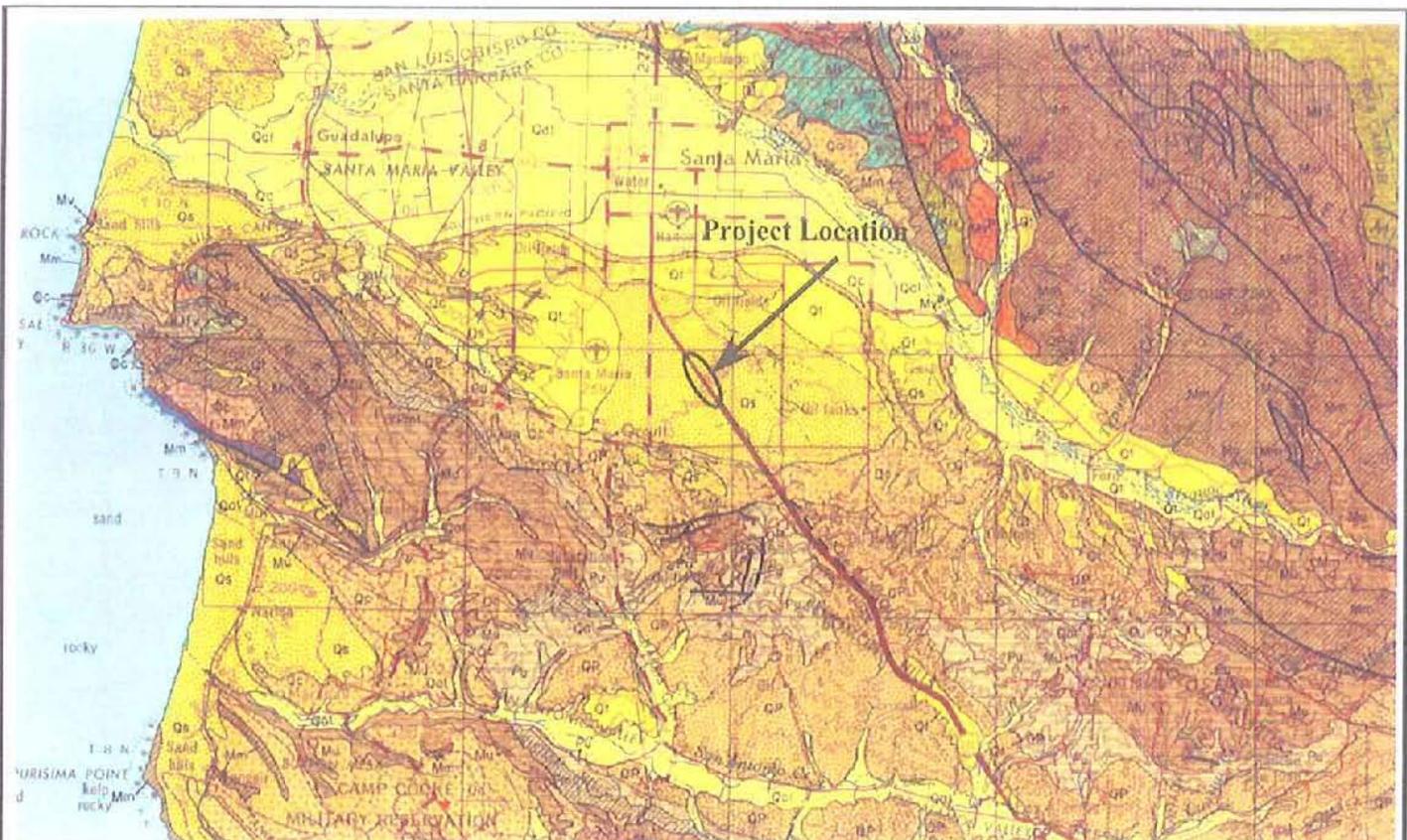
RELATIVE HORIZONTAL SCALE: 1" = 15' HORIZONTAL

CONTRACT NO. []

CU 06254 EA 402800

DATE PLOTTED: 03-24-11 10:03 AM

00-00-00



Map adapted from Jennings, C.W., 1959, Geologic map of California : Santa Maria sheet; California Division of Mines and Geology

 CALTRANS Division of Engineering Services Geotechnical Services Office of Geotechnical Design - North	EA: 05-463801	<h1>GEOLOGIC MAP</h1> <p>05-SB-101 PM 83.1/83.9</p>

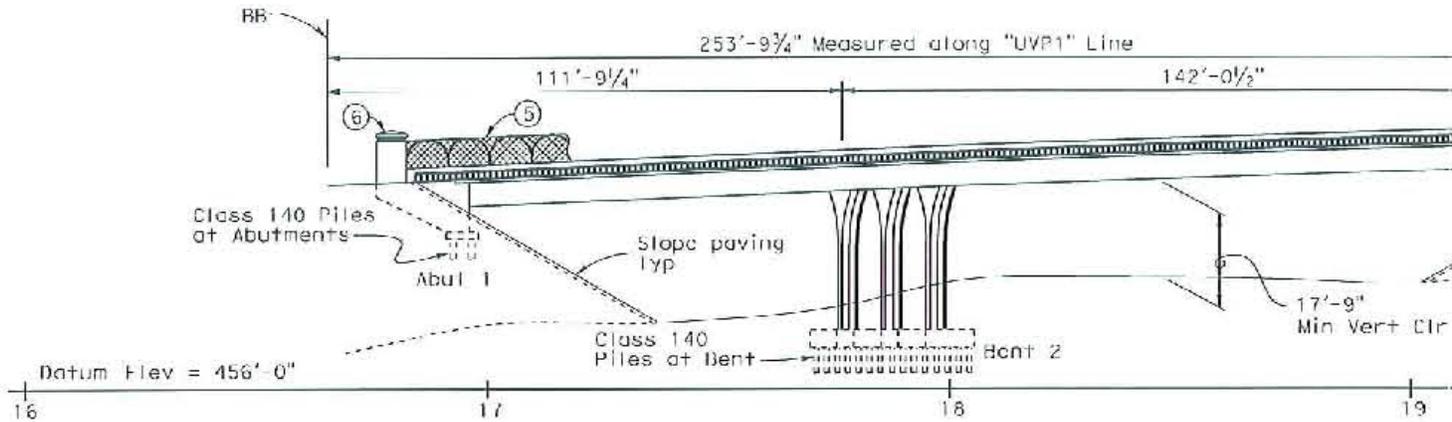
Sta 17+60 BVC
Elev 503.75

13.931%

720'-0" VC
R/C = -.824% Per Sta

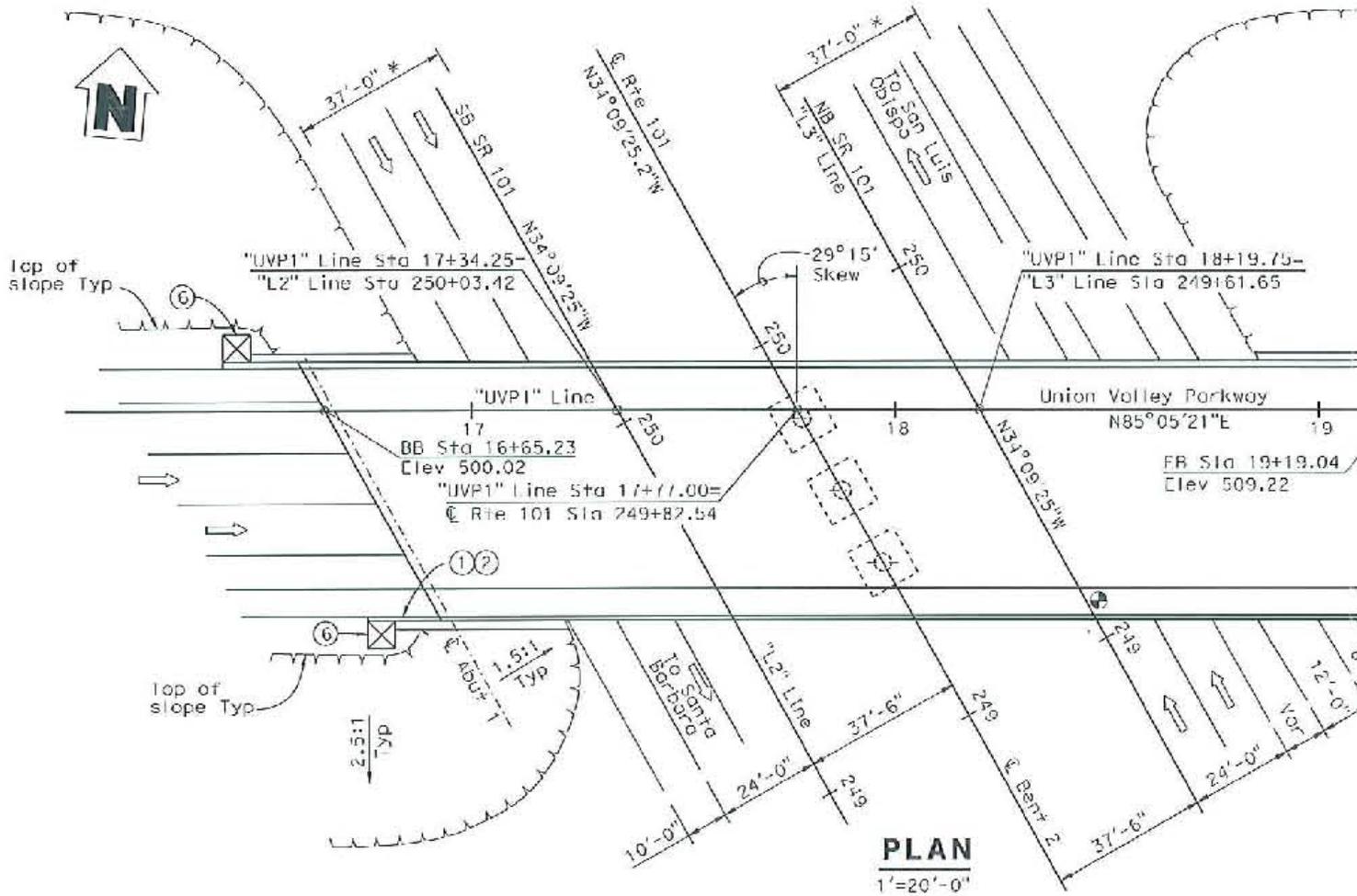
PROFILE GRADE

No Scale



ELEVATION

1"=20'-0"



PLAN

1"=20'-0"

DESIGN ENGINEER	DESIGN	BY R. Anderson	CHECKED X	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING	H ₉₃ W/ "LOW DOY" 1
	DETAILS	BY G. Hollstrom	CHECKED X	LAYOUT	BY X	PERMITS DESIGN VEHICLE
	QUANTITIES	BY X	CHECKED X	SPECIFICATIONS	BY X	PLANS AND SPECS COMPARED X

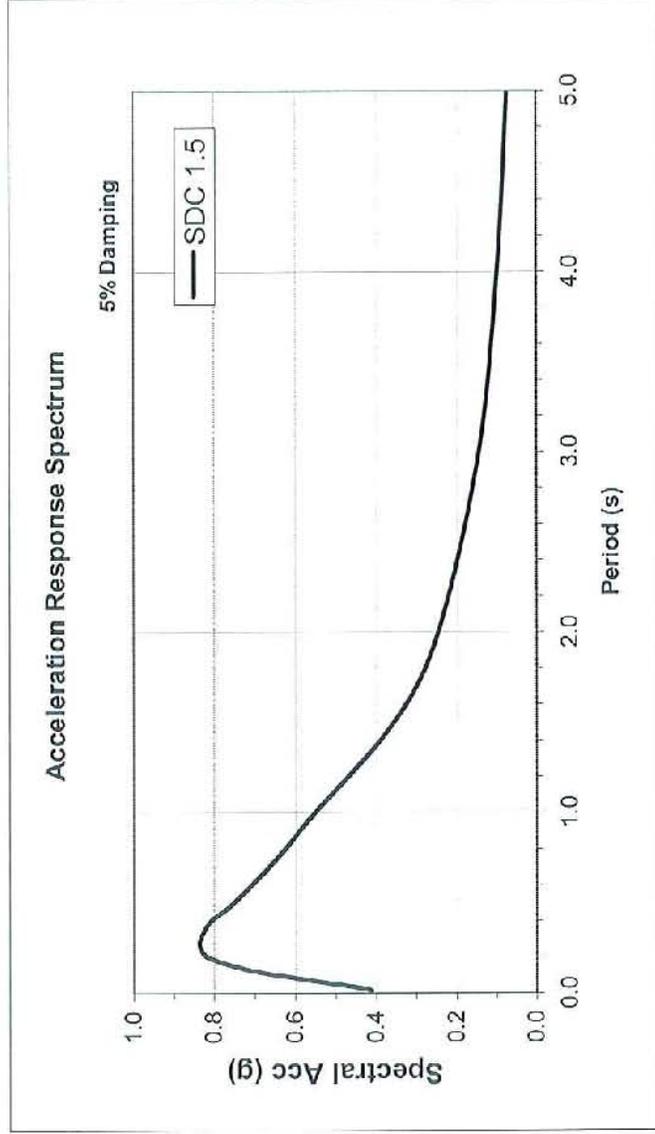
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

Union Valley Parkway OC

Bridge No. 51-0338

SDC 1.5 Controlling Procedure : Probabilistic/Deterministic

Period (s)	SDC 1.5
0.010	0.411
0.020	0.417
0.030	0.437
0.050	0.492
0.075	0.566
0.100	0.642
0.120	0.693
0.150	0.749
0.200	0.814
0.250	0.834
0.300	0.834
0.400	0.808
0.500	0.753
0.750	0.645
1.000	0.552
1.500	0.356
2.000	0.246
3.000	0.144
4.000	0.098
5.000	0.073



Deterministic Procedure Data

Fault	Casmalia	R_{rup}	3.97	km
Fault ID	124	R_{jb}	3.97	km
Style	Reverse	R_x	3.97	km
Mmax	6.5	V_{s30}	293.00	m/s
Dip	75	$Z_{1.0}$	327	m
Z_{TOR}	0	$Z_{2.5}$	2.00	km

Notes

ARS curve was modified for Near Fault Directivity Effect (SDC Ver. 1.4 Section 6.1.2.1)

General Foundation Information to be sent from SD to GS

Foundation Design Data Sheet								
Support No.	Design Method	Pile Type	Finished Grade Elevation (ft)	Cut-off Elevation (ft)	Pile Cap Size (ft)		Permissible Settlement under Service Load (in)*	Number of Piles per Support
					B	L		
Abut 1	WSD	Class 140	492.27	487.52	7	72	1" or 2"	20 (2 rows of 10)
Bent 2	LRFD	Class 140	473.50	466.75	12	12	1" or 2"	16 (4 rows of 4)
Abut 3	WSD	Class 140	501.47	496.72	7	72	1" or 2"	20 (2 rows of 10)

Based on CALTRANS' current practice, the total permissible settlement is one inch for multi-span structures with continuous spans or multi-column bents, one inch for single span structures with diaphragm abutments, and two inches for single span structures with seat abutments. Different permissible settlement under service loads may be allowed if a structural analysis verifies that required level of serviceability is met.

Design Loads to be sent from SD to GS

Foundation Design Loads											
Support No.	Service-I Limit State (kips)			Strength Limit State (Controlling Group, kips)				Extreme Event Limit State (Controlling Group, kips)			
	Total Load		Permanent Loads	Compression		Tension		Compression		Tension	
	Per Support	Max. Per Pile		Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile	Per Support	Max. Per Pile
Abut 1	2200	110	1575	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bent 2	1770	N/A	1355	2430	185	0	0	1680	105	0	0
Abut 3	2200	110	1575	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

FOUNDATION REVIEW

DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES

To: **Structure Design**

Date: 8/22/11

1. Design
2. R.E. Pending File
3. Specifications & Estimates
4. File

Union Valley Parkway OC
Structure Name

Geotechnical Services

1. GD - North ; South ; West
2. GS File Room

05-SB-101-83.45
District County Route km Post

District Project Development District Project Engineer

05 am 5501
05-463801 51-338
E.A. Number Structure Number

Foundation Report By: R. Turner

Dated: 2/17/10

Reviewed By: R. Anderson (SD)

R. Price (GS)

General Plan Dated: 8/3/11

Foundation Plan Dated: 1/19/11

No changes. The following changes are necessary.

Show predrill limits (49 - 1.06) in SSP
to elev 462 @ Abut 1
482 @ Abut 3

FOUNDATION CHECKLIST		
<p><input checked="" type="checkbox"/> Pile Types and Design Loads</p> <p><input checked="" type="checkbox"/> Pile Lengths</p> <p><input checked="" type="checkbox"/> Predrilling</p> <p><input checked="" type="checkbox"/> Pile Load Test</p> <p><input checked="" type="checkbox"/> Substitution of H Piles For Concrete Piles <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	<p><input checked="" type="checkbox"/> Footing Elevations, Design Loads, and Locations</p> <p><input checked="" type="checkbox"/> Seismic Data</p> <p><input checked="" type="checkbox"/> Location of Adjacent Structures and Utilities</p> <p><input checked="" type="checkbox"/> Stability of Cuts or Fills</p> <p><input checked="" type="checkbox"/> Fill Time Delay</p>	<p><input checked="" type="checkbox"/> Effect of Fills on Abutments and Bents</p> <p><input checked="" type="checkbox"/> Fill Surcharge</p> <p><input checked="" type="checkbox"/> Approach Paving Slabs</p> <p><input checked="" type="checkbox"/> Scour</p> <p><input checked="" type="checkbox"/> Ground Water</p> <p><input checked="" type="checkbox"/> Tremie Seals/Type D Excavation</p>

Rene Anderson 10
Structure Design Bridge Design Branch No.

Pat
Geotechnical Services

3. Geotechnical Design Report -Union Valley Parkway Dated 8/20/2009

Geotechnical Design Report

UNION VALLEY PARKWAY INTERCHANGE

**05-463801
05-SB-101-PM 83.1/83.9**

Prepared for

Mr. Deo Calabio

Project Engineer

District 6, Design 11 – Branch V

Prepared by

Division of Engineering Services

Geotechnical Services - MS#5

Office of Geotechnical Design - North

August 2009

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1. Introduction

The Office of Geotechnical Design North (OGDN) has prepared this Geotechnical Design Report to provide geotechnical recommendations for the proposed interchange at Union Valley Parkway and Highway 101, postmiles 83.1 to 83.9, near the town of Orcutt, in Santa Barbara County. The interchange is proposed to consist of an overcrossing of Highway 101 near postmile 83.4, northbound and southbound onramps and offramps, and infiltration basins.

The purpose of this report is to document subsurface geotechnical conditions, provide analysis of anticipated site conditions as they pertain to the project herein, and to recommend design and construction criteria for the roadway portions of the project. This report also established a geotechnical baseline to be used in assessing the existence and scope of changed site conditions.

This report is intended for use by the project design engineer, construction personnel, bidders and contractors.

2. Pertinent Reports and Investigations

The District has provided topographic surveys and project plans. The following presents a list of references used in preparation of this report.

- *Topographic Map of the Orcutt quadrangle, California*, United States Geological Survey, 1974
- *Topographic Map of the Santa Maria quadrangle, California*, United States Geological Survey, 1982
- Jennings, C.W., 1959, Geologic map of California: Santa Maria sheet: California Division of Mines and Geology
- Tennyson, M.E., 1992, Preliminary geologic map of Santa Maria 30' by 60' quadrangle, California: U.S. Geological Survey, Open-File Report OF-92-189, scale 1:100000
- Sadigh, et al, 1997 attenuation equations,
http://peer.berkeley.edu/course_modules/eqrd/IntExmp/atten03.htm#calcanch
- Western Regional Climate Center for 1948-2008
- Geologic Hazards Report, Union Valley Interchange, Caltrans, November 15, 1999
- Preliminary Geotechnical Report, Union Valley Interchange, Caltrans, June 12, 2002
- Caltrans Statewide Storm Water Quality Practice Guidelines, CTSW-RT-02-009, May 2003
- As Built Plans for Construction on State Highway in Santa Barbara County in and near Santa Maria on Route 101 from South Santa Maria Undercrossing to Donovan Road Overcrossing and on Route 166 from Cuyama River Bridge 51-218 to Cuyama River Bridge 51-41, Contract No. 05-413604, September 16, 1996

- As Built Plans for Construction on State Highway in Santa Barbara County about 5.9 miles south of Santa Maria at and near Clark Avenue, Contract No. 05-047704, January 23, 1967
- As Built Plans for Construction on State Highway in Santa Barbara County from Solomon Summit Undercrossing to South Santa Maria to South Santa Maria Undercrossing, Contract No. 05-339404, February 7, 1996

3. Existing Facilities and Proposed Improvements

Highway 101 trends toward the northwest through the project area and extends from postmiles 83.1 to 83.9 (Plate 1). It is an improved four-lane highway with twelve-foot lanes, four to eight foot shoulders and unpaved center median. The roadway was constructed on a cut/fill with both cut and fill slopes graded to 2:1 (H:V). The cut and fill slopes are moderately vegetated, are moderately rilled and heavily burrowed. The area to the west of Highway 101 at the proposed overcrossing has been previously graded into approach embankments. Above and below ground utilities are situated on either side of the roadway. An old frontage road consisting of degraded asphalt-concrete was observed to the west of the highway in the vicinity of the proposed overcrossing. A maintained, A.C. paved frontage road (Morningside Drive) is situated to the northeast of the project site, and connects to the overcrossing at Santa Maria Way to the north of the project site. The area to the east of the highway is characterized by agricultural lands while the City of Santa Maria and single family residential subdivisions lie to the west of the roadway.

The project is proposed to add an interchange at Union Valley Parkway and Highway 101 (Figure 4). The interchange is to consist of an bridge (overcrossing) as well as northbound and southbound onramps and offramps. Infiltration basins are proposed for the interior ramp areas as well as the areas between the ramps and the abutments on either side of the roadway. The new cut and fill slopes are proposed to be graded at 2:1 (H:V).

There are five infiltration basins planned for the interchange. Three of the basins are situated to the east of the highway and two to the west of the highway. Their locations and elevations are depicted on the Plate 4.

4. Physical Setting

The physical setting of the project site and the surrounding area was reviewed to aid in project design and construction planning. The physical setting includes climate, topography and drainage, man-made and natural features, geology and seismicity characteristics.

4.1 Climate

According to the Western Regional Climate Center, the average annual precipitation at the Santa Maria Airport (located approximately 2.5 miles northwest of the project site) is 12.88 in. The majority of this precipitation (80%) occurs during the months of

January to March. The average snowfall in this area is approximately 0.0 in. The average maximum daily air temperature throughout the warmest month (July) is 72.9°F and the average minimum daily air temperature throughout the coldest month (January) is 63.1°F. Refer to **Table 1** for the monthly climate summary.

Table 1: Period of Record Monthly Climate Summary

Santa Maria Public AP, California (047946) Period of Record : 1/1/1948 to 1/31/2008

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	63.1	64.4	64.8	66.9	68.3	70.7	72.9	73.3	74.4	73.5	69.3	64.4	68.8
Average Min. Temperature (°F)	38.9	40.9	42.1	43.5	46.8	50.1	53.1	53.7	52.2	47.9	42.7	38.6	45.9
Average Total Precipitation (in.)	2.55	2.73	2.3	1.05	0.29	0.04	0.03	0.03	0.20	0.48	1.33	1.85	12.88
Average Total Snowfall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

4.2 Topography and Drainage

Based on the USGS topographic map of the Orcutt and Santa Maria quadrangles, the topographic survey and our field investigation, the site area lies in an area of low to moderate topographic relief with elevations ranging from approximately 420 feet to 530 feet above mean sea level in the immediate vicinity of the project site (Plate 2). Slopes in the project area range from 2:1(H:V) and flatter.

Surface drainage for the highway appeared to be managed by a system of side swales, drop inlets and culverts.

4.3 Man-made and Natural Features of Engineering and Construction Significance

The area to the west of the proposed overcrossing has been previously graded into apparent approach embankments and access roads.

Aboveground or belowground utilities were observed to the east and west of the roadway during the site reconnaissance.

Embankment fills slopes along the roadway were placed at 2:1 (H:V) and the existing cut slopes are at 2:1 (H:V). The embankment slopes are moderately vegetated and are experiencing a moderate amount of surficial erosion in the form of rilling. The cut slopes are also performing similarly. Numerous animal burrows were observed in the slopes.

4.4 Regional and Local Geology and Seismicity

This portion of Highway 101 lies in the Coast Ranges geomorphic province. The province is characterized by west to northwest trending mountains bordering the Pacific

Ocean. The mountains were created by active uplift along several northwest trending reverse faults.

According to the Geologic Map of California, Santa Maria sheet (CDMG, 1959), the project was constructed on Quaternary dune sand (Plate 3). The sand has been confirmed via the as-built LOTB's for the surrounding structures and our site reconnaissance. The upper 50-feet of material consists of semi-compact to dense, yellow, orange-brown, and brown, mostly fine to medium grained SAND (SM), few rounded gravels, and trace to few fines. The material was dry to slightly moist and micaceous. Locally, the dune sand is exposed in many of the cut slopes. Artificial fill associated with roadway construction composes the embankment slopes to the east of the roadway.

The State of California, Department of Conservation Map of California Showing Principle Asbestos Deposits was reviewed. According to this map, the site is not near an area of naturally occurring asbestos. Asbestos forming minerals such as chrysotile, actinolite or tremolite were not observed during the site reconnaissance.

Based on the California Seismic Hazard Map with errata (Caltrans, 1996), the controlling fault is the Casmalia fault (CMA). The CMA is a reverse type of fault. The fault possesses a Maximum Credible Earthquake moment magnitude of $M_w = 6.75$ and is located approximately 0.25 miles west of the project site. Based on the Attenuation Curves (Mualchin and Jones, 1982) the peak bedrock acceleration at the site is about 0.48g. The peak ground acceleration is about 0.53g for a reverse type fault based on the Geometrix (1997) attenuation curves.

According to the Alquist Priolo Special Study Zone maps, the site is not located within a Special Study Zone (SSZ).

A detailed site specific analysis will be conducted during the Foundation Report phase of investigation for the overcrossing.

4.5 Soil Survey

We reviewed the United States Department of Agriculture - Natural Resource Conservation Service web page for soil survey information. The web page can be found at <http://websoilsurvey.nrcs.usda.gov/app/>. According to the WSS for the Northern Santa Barbara Area (CA672) the surficial soils consist primarily of Oceano sand (OcD) with some Marina sand (MaE) at the northerly portion of the project site. The survey indicates that the MaE is a well to poorly sorted, fine to medium grained SAND (SP-SM). The OcD is a well sorted, fine to medium grained SAND (SM). Both the MaE and OcD are nonplastic and have a moderate risk of corrosion to uncoated steel and concrete.

5. Exploration

5.1 *Drilling, Sampling and Testing*

In order to determine the suitability of the on-site soils to infiltration, five percolation tests were performed to a maximum depth of thirty feet below the existing ground surface (Plate 4). Percolation tests were performed by boring a hole using hand operated equipment, placing slotted PVC pipe to the bottom of the hole, and filling the annular space with clean sand. Percolation tests were performed until consecutive readings stabilized within ten percent. A double-ring infiltrometer was not used due to the depth of the tests, and the amount of excavation required for such a test. Table 2 shows the percolation rates for the 5 test locations.

Table 2: Percolation Test Summary

Test Location	Basin Number	Percolation Rate
1	1	0.83 minutes/inch (72.3 in/hr)
2	2	0.28 minutes/inch (214 in/hr)
3	3	1.39 minutes/inch (43.2 in/hr)
4	4	1.2 minutes/inch (50 in/hr)
5	5	0.42 minutes/inch (143 in/hr)

Due to the high percolation rate (50 in/hr to 214 in/hr) the on-site soils will not be able to readily retain water if it is determined that not all of the basins will be used for infiltration. If any of the basins will be used for detention, the soils may need to be treated for such usage. Treatment may include the addition of an impermeable liner (artificial or natural) either on the basin surface, or buried below the basin surface. If such a treatment is desired we can provide recommendations in an addendum report.

Also due to the high percolation rate, basins should not be situated at an elevation above any surrounding improvements. According to the elevations provided in the project plans, there may be a potential for seepage from Basins 3 and 4 through the cut slope.

According to page B20, Appendix B of the Caltrans Statewide Storm Water Quality Practice Guidelines states that the maximum infiltration rate allowed for any infiltration device is 2.5 in/hr unless approved by the Regional Water Quality Control Board. We were informed that the basin complex design may comprise detention, pumping and infiltration. The above percolation rates should be used for design of the stormwater system.

5.2 *Geophysical Studies*

Because the existing materials on either side of the highway are anticipated to be rippable, a geophysical survey was not conducted.

6. Geotechnical Conditions

6.1 *Natural Slope Stability*

The existing slopes in the project area appear globally stable. There is a minor to moderate amount of surficial erosion in the area as evidenced by rilling of the slopes. Numerous animal burrows were present in both embankment and cut slopes.

6.2 *Subsurface Soil Conditions*

According to the as-built LOTB's and the subsurface investigation, the top fifty feet of soils consist well sorted to poorly sorted silty SAND (SP-SM) that is semi-compact to dense, dry to slightly moist, fine to medium grained, and contains few fine rounded gravels and trace to few fines. The material is non to weakly cemented and micaceous.

6.3 *Rock Conditions*

There is no rock within the project limits.

6.4 *Water*

6.4.1 *Surface Water*

Surface water is being handled by a system of side swales, drop inlets and culverts.

6.4.2 *Ground Water*

According to the Water Data Library provided through the Department of Water Resources, <http://www.water.ca.gov/waterdatalibrary/>, groundwater currently lies at about 100 to 150 feet below existing ground surface. Ground water levels may fluctuate with seasonal rainfall and local water pumping for irrigation. Groundwater was not encountered during the subsurface soil exploration.

6.5 *Erosion*

As shown on the site topographic map, there are many existing slopes within the project boundaries. The existing cut and fill slopes are moderately vegetated with native vegetation and show minor amounts of erosion. Erosion on the slopes is moderate to high and new slopes should be graded at 2:1 (H:V) to accommodate the erosion potential.

A soil erodibility factor (k) is a measure of the susceptibility of soil particles to detachment and transport by rainfall and runoff. A soil erodibility factor of $k \cong 0.35$ is recommended for the silty sand present at the site. Soil erosion protection should be applied to the slope faces.

7.0 Geotechnical Conclusions and Recommendations

7.1 Fill Slopes

For embankment fills, a 2:1 (H:V) or flatter slope is the recommended due to the erosion potential nature of the subsurface materials. All embankment slopes should be constructed in accordance with Caltrans Standard Specification Section 19-5 and 19-6.

7.2 Cut Slopes

Because the materials anticipated to be exposed in the new cut slopes are underconsolidated and subject to moderate to severe water and wind erosion, the proposed cut slopes should be graded at 2.5:1 (H:V).

7.3 Rockfall

There is no rockfall associated with the project.

7.4 Stepped Slopes

Stepped slopes are not anticipated to be used on this project.

7.5 Settlement

Soils encountered during the field reconnaissance were did not appear to contain significant amounts of plastic fines. We do not suggest earthwork quantities be adjusted to account for settlement.

7.6 Rippability and Blasting

The silty sand with gravel is 100% rippable.

8. Material Sources and Disposal

The material to be used as fill will come from the cut sections. The cuts and fills have been balanced as much as possible to minimize importing or exporting fill. The material on-site will consist of sands and silty sands. The material should be suitable for the construction of the new embankment slopes provided they meet all of our specifications. With exception to the surface erosion, the previously graded slopes to the west of the site appeared stable and suitable for use provided they have been constructed in accordance with our standard specifications. Refer to Section 19-6.01 of the Standard Specifications for more information.

9. Construction Considerations

The design of the stormwater treatment system will need to take into account the high percolation rate of the soils. The basins should not be designed at an elevation above surrounding improvements as seepage may occur.

Trenches and borings performed in this area will have a high potential for collapse and will need to be shored.

10. Appendices

11.1 Plates

APPENDIX 11.1

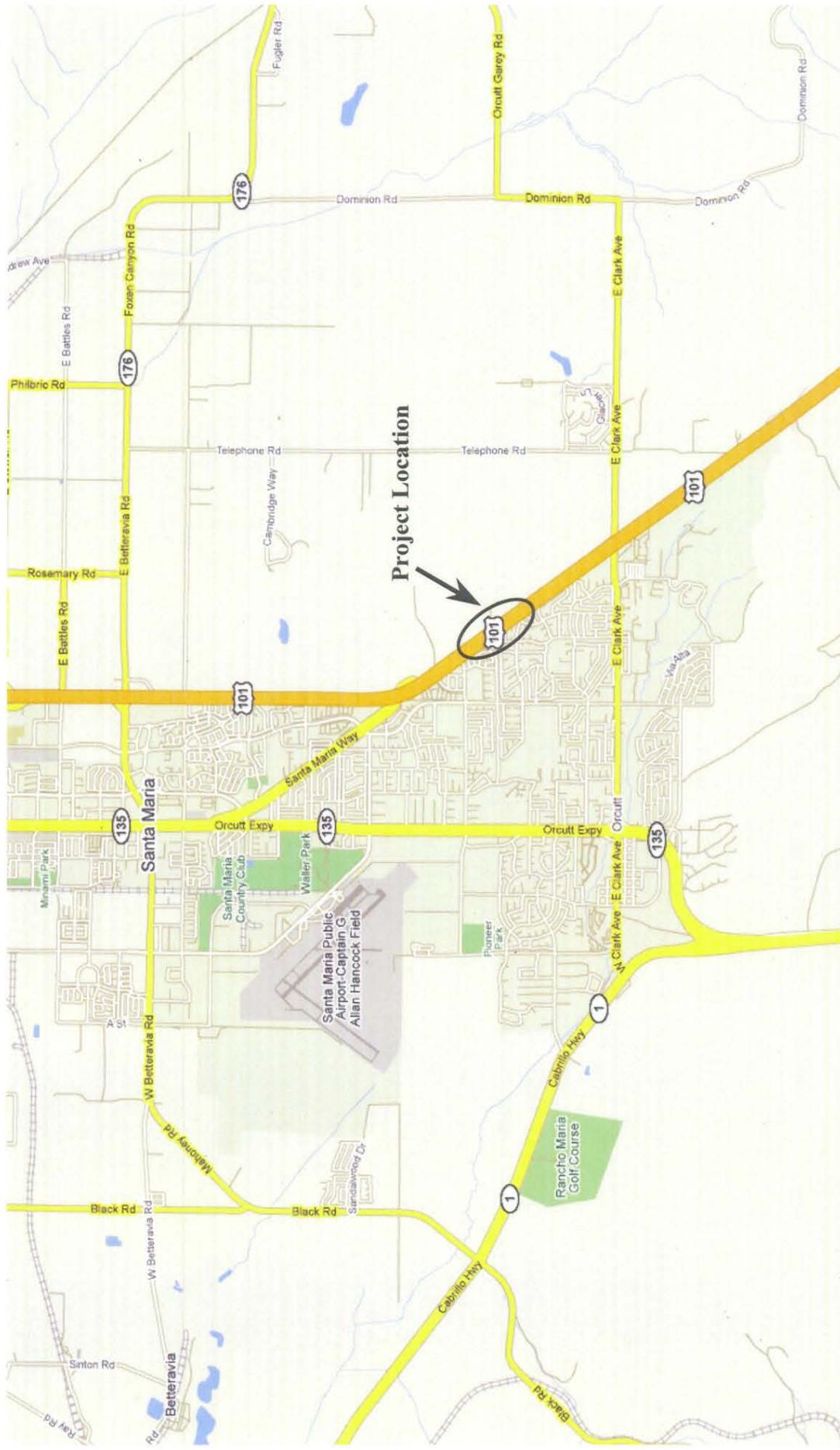
Plates

Plate 1: Vicinity Map

Plate 2: Topographic Map

Plate 3: Geologic Map

Plate 4: Project Layout



Map adapted from Google Maps, 2009

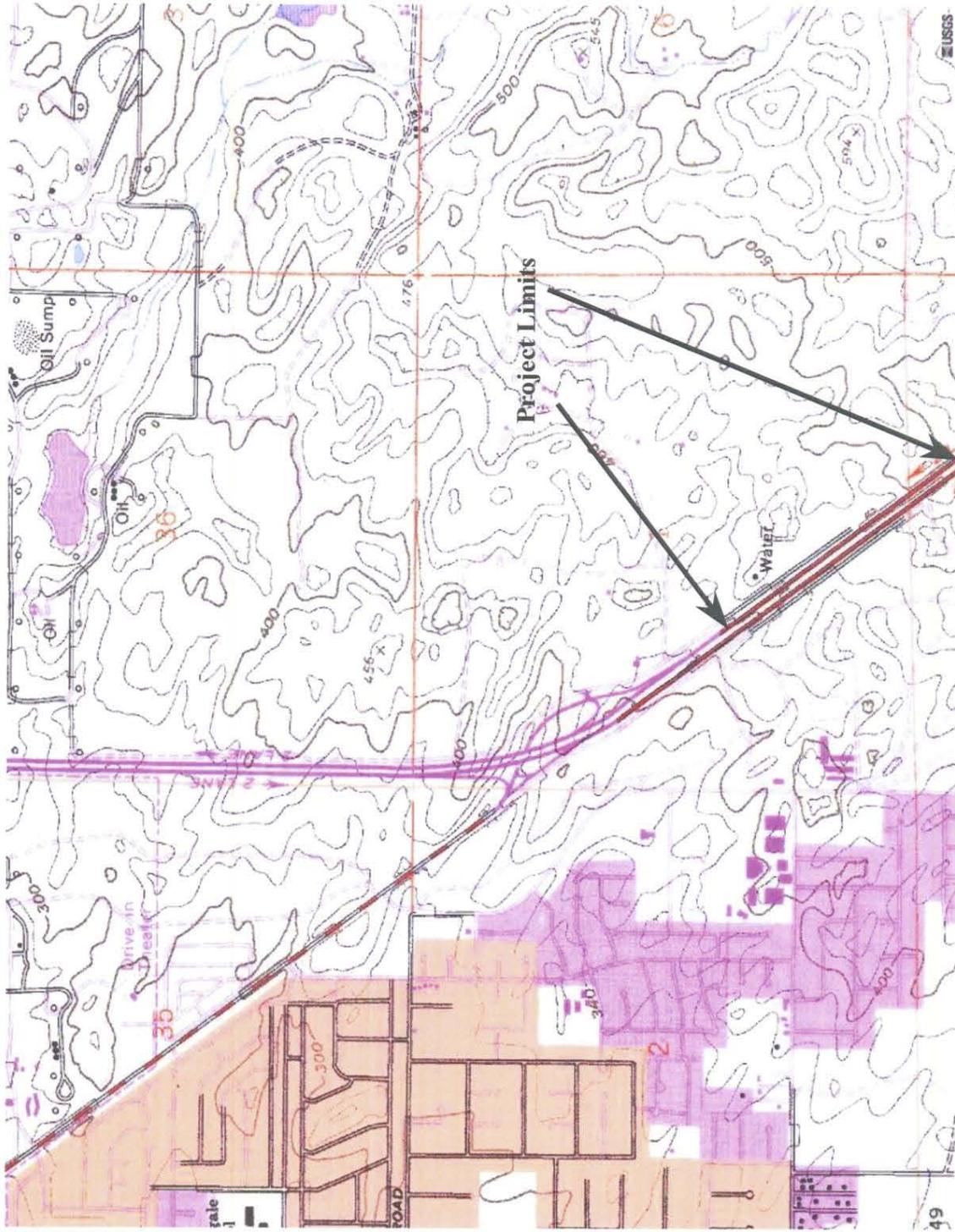

CALTRANS
 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

EA: 05-463801
Date: JULY 2009

VICINITY MAP

PLATE 1

05-SB-101 PM 83.1/83.9



Map adapted from the Topographic Map of the Santa Maria quadrangle, 1982

EA: 05-463801

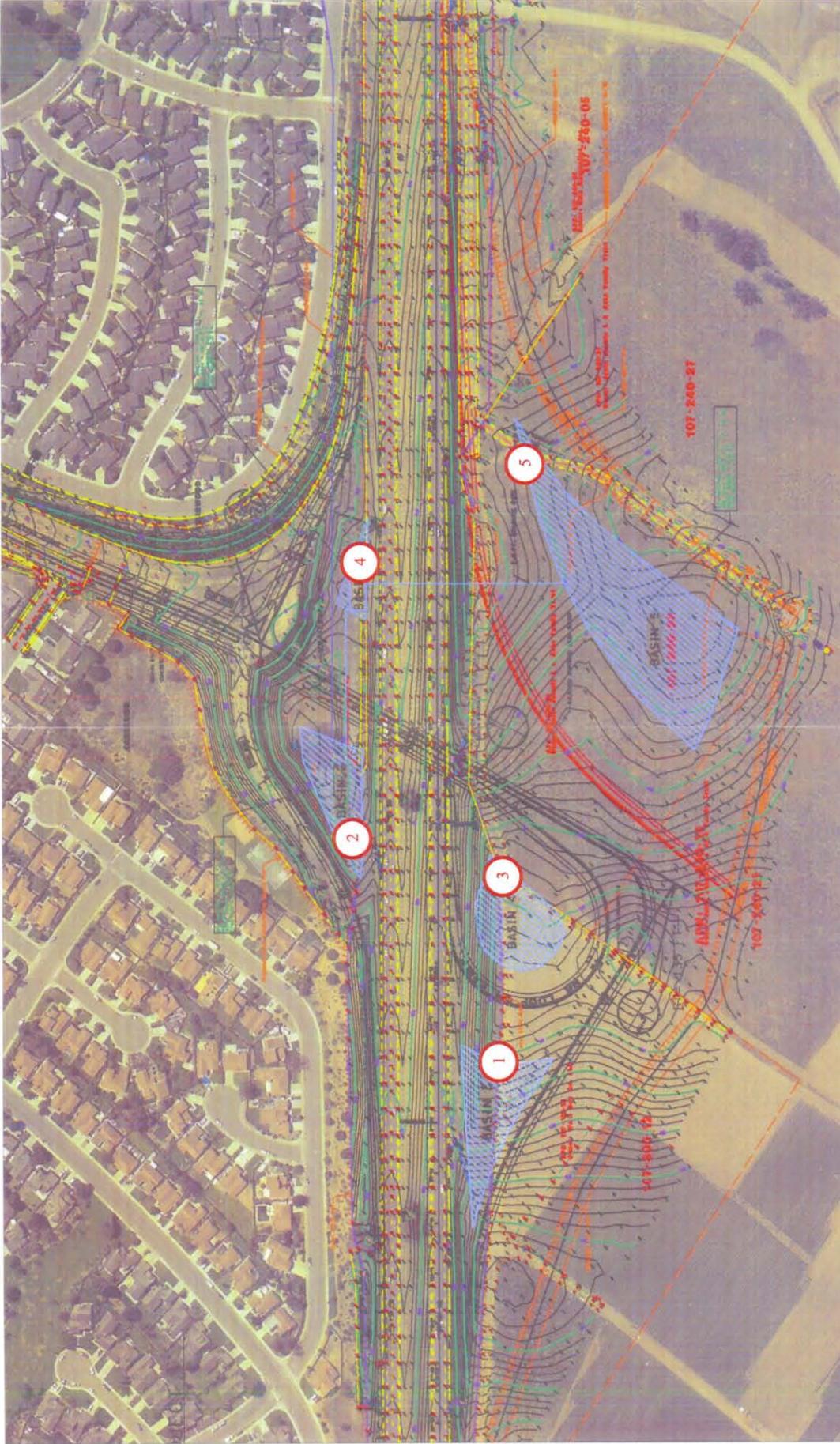
Date: JULY 2009

PLATE 2

TOPOGRAPHIC MAP

05-SB-101 PM 83.1/83.9


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5 Test Locations

EA: 05-463801

Date: JULY 2009

PLATE 4

PROJECT LAYOUT

05-SB-101 PM 83.1/83.9



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 Division of Engineering Services
 Geotechnical Services
 Office of Geotechnical Design - North

4. Sound Wall Foundation Report dated 1/26/11

Memorandum *Flex your power! Be energy efficient!*

To: BORIS AYAVIRI **Date:** January 26, 2011 Senior Transportation Engineer Central Region Project Development **File:** 05-SB-101-83.1/83.9 Design II/ Branch V Union Valley Pkwy OC
EA: 05-463801 **Project ID:** 0500000550 **Attn:** Anonh Sengmany Project Engineer

From: **DEPARTMENT OF TRANSPORTATION DIVISION OF ENGINEERING SERVICES
GEOTECHNICAL SERVICES**

Subject: Sound Wall Foundation Report

Scope of Work

A Foundation Report (FR) is provided for the above referenced project. The proposed project is located near the towns of Orcutt and Santa Maria in Santa Barbara County. Construction of an interchange with an overcrossing to carry Union Valley Parkway (UVP) over SR 101 is proposed. Improvements are proposed to provide access to SR 101 via UVP, which is classified as a major arterial for the community. Construction of the interchange is also intended increase the levels of service at the adjacent SR 101 interchanges, Clark Avenue to the south and South Santa Maria Undercrossing to the north. Construction of a sound wall (SW1) adjacent to the proposed southbound onramp is proposed as part of the project. Review of published geologic data and previous geotechnical reports, field reconnaissance, and design calculations were performed as part of the geotechnical investigation.

The purpose of this report is to document geotechnical conditions and provide foundation recommendations for the sound wall.

Project Description

SR 101 through the project limits is classified as a principal arterial. The existing roadway trends northwest/southeast and is a four-lane divided freeway with 12-foot lanes, 2-foot inside shoulders, 8-foot outside shoulders and an unpaved median. The roadway was constructed on cut and fill slopes graded to 2:1 (H:V). Agricultural lands border SR 101 to the east and county property separates a residential development from the right of way to the west. An earthen berm currently serves as a sound barrier in the location of the proposed soundwall. Removal of the berm will be required to construct the southbound onramp. The southern end of the proposed sound wall will tie into an existing CMU sound wall. Refer to the attached sound wall plan for the location of the proposed sound wall relative to existing facilities and features.

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Pertinent Reports and Investigations

The following publications were used to assist in the assessment of site conditions:

- 1 *Draft Geotechnical Design Report*, EA 05-463801, Caltrans, Brandon Badeker, 2009.
- 2 *Geologic Hazards Report Union Valley Interchange*, EA 05-463800, Caltrans, 1999.
- 3 *Preliminary Geotechnical Report Union Valley Interchange*, EA 05-463800, Caltrans, 2002.
- 4 *Geologic Map of California, Santa Maria Sheet*. California Division of Mines and Geology, C.W. Jennings, 1959.
- 5 *Union Valley Parkway Overcrossing Foundation Report*, EA 05-463801, Caltrans, Ryan Turner, 2010.

Physical Setting

The project is located in the Santa Maria Valley ecological subsection of the Central California Coast. The average annual precipitation is 13 inches and the average air temperature is 57° F. The climate is hot and sub-humid and is affected by the marine influence, with morning fog often present in the summer months.

The main drainage feature in the region is the Santa Maria River to the north of the project, which is dry for most of the year but swells during winter storms. Swales, drop inlets, and culverts currently manage surface drainage in the vicinity of the proposed overcrossing. No streams or rivers are within the project extents.

Field Investigation and Laboratory Testing

Two mud-rotary borings were drilled near each end of the soundwall layout line to determine the subsurface conditions at the proposed foundation locations. In-situ soil strength parameters were determined using the Standard Penetration Test (SPT) for cohesionless soils. No significant layers of cohesive soils were encountered in the borings. Laboratory tests were used to determine the particle size distribution and corrosion potential of representative samples obtained at depth.

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Site Geology and Subsurface Conditions

Geology

The region falls within the Coast Ranges geomorphic province of California. Northwest trending mountains bordering the Pacific Ocean characterize the province. The project site is located at the foot of the Coast Ranges in the Santa Maria Valley between the mountains and the ocean. Quaternary aged dune sands are shown on the geologic map for the area. Fine to medium grained sands were encountered during construction of the adjacent Clark Avenue and South Santa Maria Undercrossing interchanges and are exposed in cut slopes within the project extents. Similar soils were encountered during the subsurface investigation.

Subsurface Conditions

Field observations, in-situ sampling, and laboratory testing indicate that the site is underlain by medium dense to dense poorly-graded dune sands. The dune deposits are mostly fine to medium grained sands with trace non-plastic fines.

Groundwater

An open observation well was installed in boring R-11-005 to observe fluctuations in groundwater levels and determine if groundwater will influence construction and foundation design. Results of the groundwater-monitoring program are summarized in Table 1. Groundwater is not expected to be encountered in the foundation excavations.

Table 1. Groundwater Elevations

Corrosion Evaluation

The Department considers a site to be corrosive to foundation elements if one or more of the following conditions exist for the representative soil and/or water samples taken at the site: pH of less than 5.5, chloride content greater than 500 ppm, or sulphate content greater than 2000 ppm. Soil samples were obtained in each of the borings and sent to the District 5 Geotechnical Laboratory for corrosion potential evaluation. Based on the results of the corrosion analyses, the site is not considered to be corrosive. Refer to the table below for complete corrosion testing results.

Table 2. Corrosion Testing Summary

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Foundation Recommendations

Masonry Block on Pile Cap

Standard Plan CIDH (cast-in-drilled-hole) piles are the recommended foundation alternative for the site. Refer to the Standard Plans for construction details. Foundation recommendations are provided in Table 3.

Table 3. Mr. Boris Ayaviri
 January 26, 2011
 Page 6 of 6

Sound Wall Foundation
 Union Valley Parkway
 Project I

<i>Wall Station (ft)</i>	<i>Design Wall Height (ft)</i>	<i>Foundation Type</i>	<i>Groundline Condition</i>	<i>Soil Friction Angle (degrees)</i>
9+81.40 to 10+40	10	CIDH Piles	Case II	30
10+40 to 10+80	8	CIDH Piles	Case II	30
10+80 to				

Recommendations

Construction Considerations

Caving soils may be encountered near the ground surface in dry, loose sands. The use of surface

casing or other methods may be required to advance the pile excavations into more stable soils.

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Ryan Turner

Michael S. Finegan

of 6 Project ID: 0500000550

If you have any questions or comments, please contact Ryan Turner at (805) 549-3750 or Michael Finegan at (805) 549-3194.

Signed: January 26, 2011

RYAN TURNER, P.E. MICHAEL S. FINEGAN, P.E. Transportation Engineer Civil Branch Chief
Geotechnical Design – North Geotechnical Design – North Branch D Branch D

c: Roy Bibbens / GDN Records Job File / Branch D Records GS Corporate (email
Mark_William@dot.ca.gov) David Beard / Project Manager Structure Construction RE
Pending File (email RE_pending_file@dot.ca.gov) Kelly Holden / DES Office Engineer
Andrew Tan / PCE Douglas Lambert / DME

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LIST OF ATTACHMENTS

Vicinity Map Attachment 1 Sound Wall Plan Attachment 2

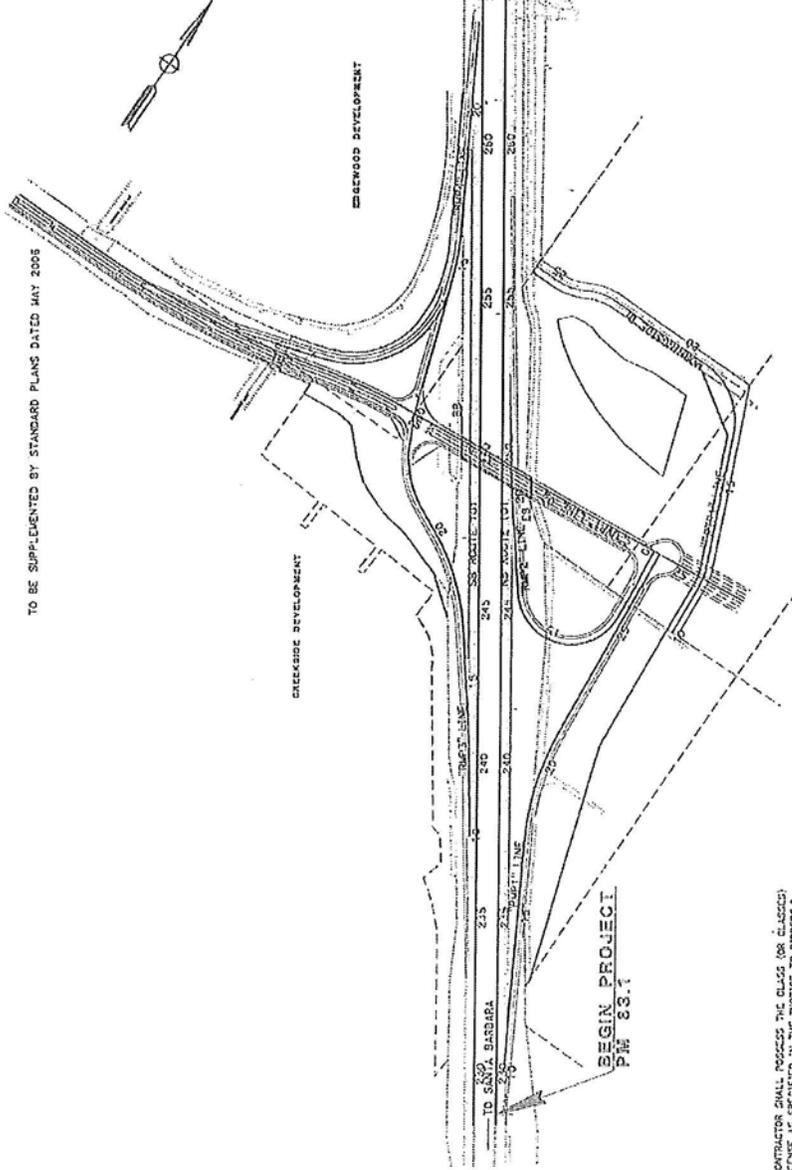
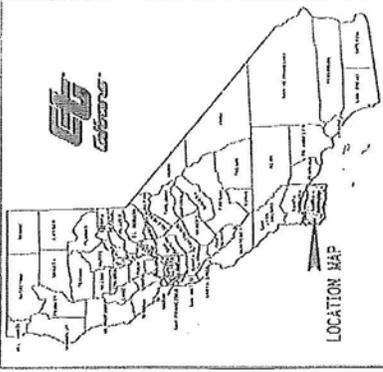
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INDEX OF PLANS

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION PROJECT PLANS FOR CONSTRUCTION ON STATE HIGHWAY

TO BE SUPPLEMENTED BY STANDARD PLANS DATED MAY 2006

STATE COUNTY ROUTE DISTRICT PROJECT NO.
05 SS 101 83.1/83.9



BEGIN PROJECT
P.M. 83.1

END PROJECT
P.M. 83.9



PROJECT NUMBER: _____ DATE: _____
INTERSECTION: _____
PLANS APPROVAL DATE: _____
BY: _____
CHECKED BY: _____
DATE: _____

THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSIFICATION) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

CONTRACT NO. CU 08254 EA 403900

SCALE: 1" = 40'

SCALE: 1" = 40'

SCALE: 1" = 40'

SCALE: 1" = 40'

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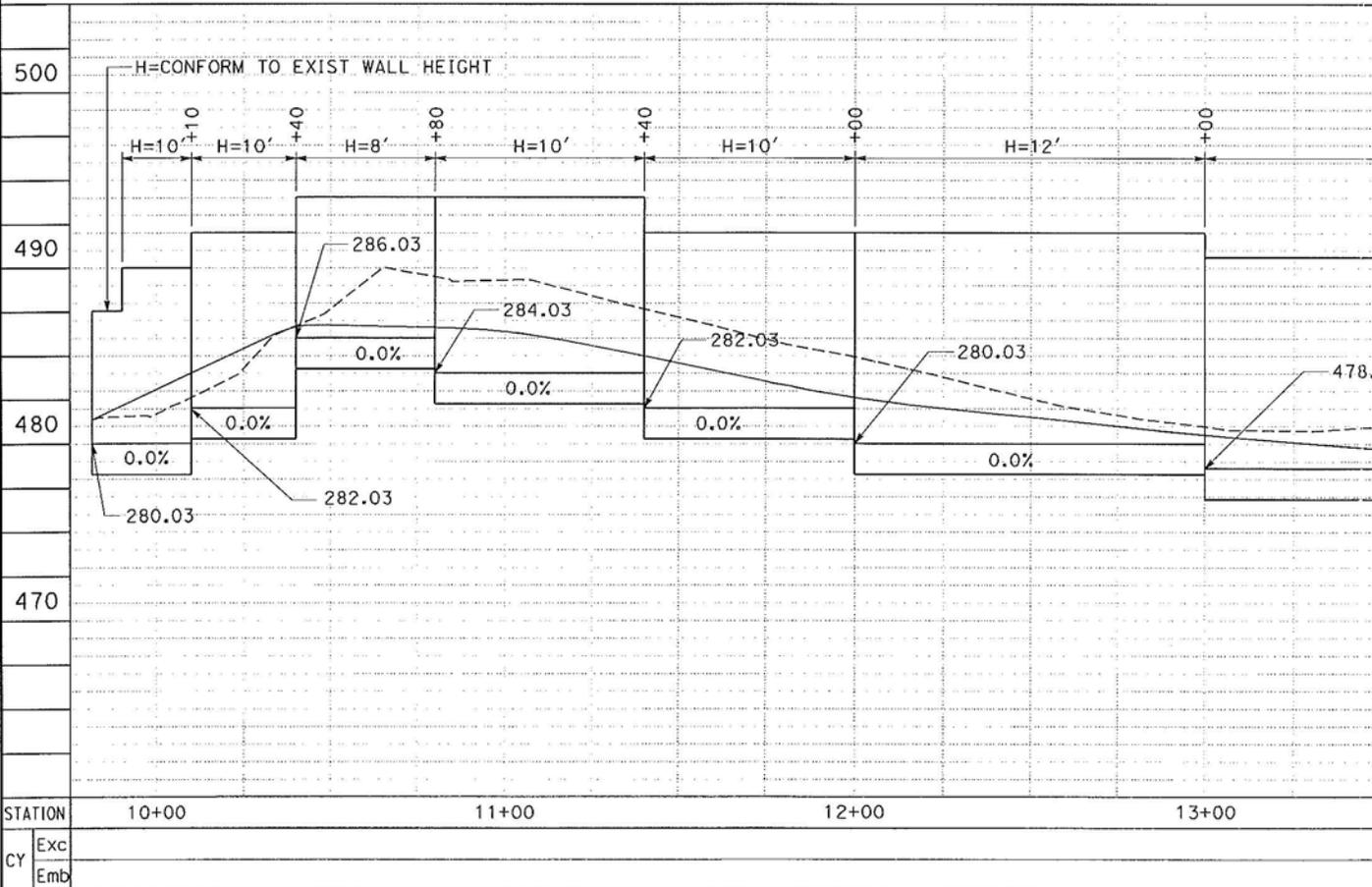
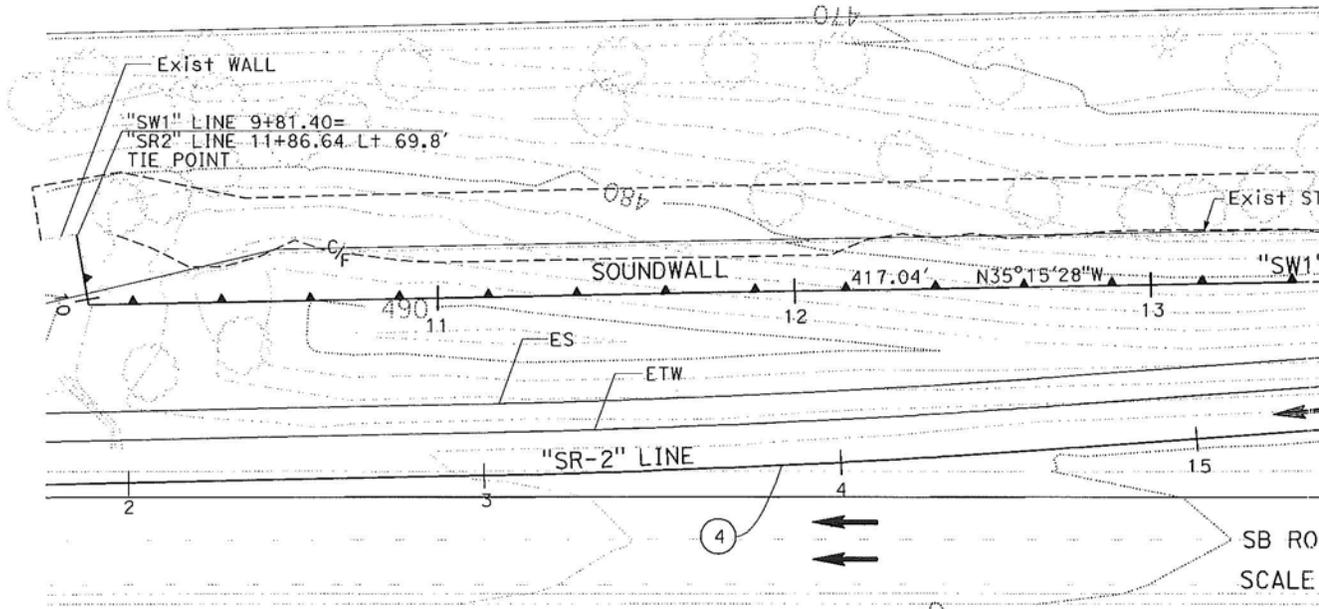
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CURVE DATA

No. ④	R	Δ	T	L
4	3000.00'	03°11'29"	83.57'	167.10'
5	700.00'	30°06'54"	188.32'	367.92'
13	699.60'	18°51'39"	116.20'	230.30'

HARMONY Ln



FUNCTIONAL SUPERVISOR

DEPARTMENT OF TRANSPORTATION



STATION	10+00	11+00	12+00	13+00
Exc				
Emb				

5. Abandoned oil pipeline disclosure

Memorandum

*Flex your power!
Be energy efficient!*

To: BIDDERS/RESIDENT ENGINEER

Date: November 10, 2011

File: SB-101-83.1/83.9
05-463801

From: DEPARTMENT OF TRANSPORTATION
ANONH SENGMAN
Project Engineer

Subject: Disclosure - Abandoned Oil Line

The Contractor should be aware that Highway 101 crosses through a previously active oil field and there is the possibility of encountering undocumented pipelines and other related hazards during construction.

Near the soundwall, an abandoned oil line may be in conflict. It is shown on the plans but it was not potholed and it is not sure who owns the pipeline. The first order of work would be to perform a wet tap to validate that the pipeline is in fact abandoned.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days prior to performing any excavation or other work close to any underground pipeline, conduit, wire or other structure.



ANONH SENGMAN
Project Engineer

11/14/11
Date

6. SITE INVESTIGATION REPORT

SITE INVESTIGATION REPORT

ROUTE 101 – PROPOSED UNION VALLEY PARKWAY INTERCHANGE SANTA MARIA, CALIFORNIA



GEOCON

**GEOTECHNICAL
&
ENVIRONMENTAL
CONSULTANTS**

PREPARED FOR

**CALIFORNIA DEPARTMENT OF TRANSPORTATION
DISTRICT 5**

SAN LUIS OBISPO, CALIFORNIA

TASK ORDER NO. 05-446010-GL

GEOCON PROJECT NO. E8000-06-58

MAY 2001



Project No. E8000-06-58
May 24, 2001

James Tkach, Contract Manager
California Department of Transportation
District 5
50 Higuera Street
San Luis Obispo, California 93401-5415

Subject: SITE INVESTIGATION REPORT
ROUTE 101 – PROPOSED UNION VALLEY PARKWAY INTERCHANGE
SANTA MARIA, CALIFORNIA
CONTRACT NO. 43A0012
TASK ORDER NO. 05-446010-GL

Dear Mr. Tkach:

In accordance with Caltrans Contract No. 43A0012 and Task Order No. 05-446010-GL, Geocon Consultants, Inc. has performed environmental engineering services at the project site. The project site consists of a section of Route 101 in the unincorporated Orcutt Y area just south of the Santa Maria Way Undercrossing in Santa Maria, California.

The accompanying report summarizes the services performed including the advancement of hand-auger boreholes, limited soil sampling, and laboratory testing.

The contents of this report reflect the views of Geocon Consultants, Inc., who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

If there are any questions concerning the contents of this report, or if Geocon may be of further service, please contact the undersigned at your convenience.

Sincerely,

GEOCON CONSULTANTS, INC.


Ross J. White
Sr. Staff Geologist

RJW:RWD:rjw

(10) Addressee


Richard W. Day, CEG, CHG
Regional Manager

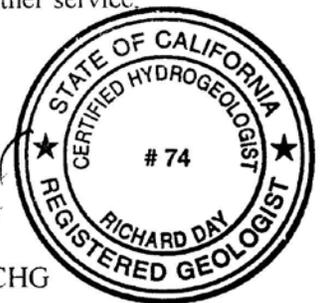


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EXECUTIVE SUMMARY

This Site Investigation Report for the proposed Union Valley Parkway Interchange on Route 101 was prepared under Caltrans Contract No. 43A0012 and Task Order (TO) No. 05-446010-GL (EA No. 463800).

The project is located on Route 101 in the unincorporated Orcutt Y area just south of the Santa Maria Way Undercrossing. It is understood that Caltrans will build an overcrossing to connect Union Valley Parkway with Route 101. The project will involve the construction of the overcrossing and associated on-ramps and off-ramps.

The purpose of the work outlined in Task Order (TO) No. 05-446010-GL was to evaluate the extent of lead-impacted soil within the extents of proposed excavation boundaries. The results of this investigation will be used to inform the construction contractor regarding the potential presence of lead-impacted soil and to characterize soil at the site.

To evaluate the extent of lead-impacted soil at the site, 20 borings were advanced utilizing a hand auger along the northbound and southbound shoulders of Route 101. Note that borings UV-6A through UV-6D were advanced approximately 5, 15, 25, and 35 feet from the edge of pavement to evaluate the lateral extent of potentially lead-impacted soil. All other borings were advanced at approximately 5 feet from the edge of pavement to evaluate the vertical extent of potentially lead-impacted soil. Soil samples were collected from each boring at the ground surface and from depths of approximately 0.3, 0.6, and 0.9 meter (1, 2, and 3 feet) below the ground surface (bgs).

As required by the subject TO, Geocon instructed the analytical laboratory to perform laboratory analyses under standard turn-around-time. The laboratory analyses performed are summarized below:

- All soil samples were analyzed for total lead following EPA Test Method 6010;
- Eight soil samples, chosen at random, were tested for soil pH following EPA Test Method 9045;
- Thirteen soil samples that exhibited total lead concentrations greater than ten times the lead STLC of 5.0 mg/l and less than the lead TTLC of 1,000 mg/kg were analyzed for soluble lead via the WET following EPA Test Method 7420; and
- Thirteen soil samples that exhibited soluble (WET) lead concentrations greater than the lead STLC of 5.0 mg/l were re-analyzed for soluble lead via the WET-DI following EPA Test Method 7420.

A summary of the analytical laboratory test results for soil pH, total lead, and soluble lead for the soil samples collected along the median is presented as Table 1. The laboratory report indicated the following:

- Soil pH values ranged from 5.52 to 8.96.
- Total lead concentrations ranged from less than the laboratory reporting limit of 5 mg/kg to 350 mg/kg.

- Thirteen of the 80 soil samples analyzed for total lead exhibited total lead concentrations greater than ten times the lead STLC of 5.0 mg/l and less than the lead TTLC of 1,000 mg/kg.
- Soluble lead (WET) concentrations ranged from 4.8 mg/l to 27 mg/l. Twelve of the 13 soil samples analyzed for soluble lead via the WET exhibited soluble lead concentrations greater than the lead STLC of 5.0 mg/l.
- Soluble lead (WET-DI) concentrations ranged from less than the laboratory reporting limit of 0.15 mg/l to 2.6 mg/l

In conclusion, soil samples collected from borings UV-14 through UV-17 exhibited higher lead concentrations with respect to the other borings. Based on the lead statistics performed, if excavations are at least 0.9 meter (3 feet) deep, soil generated in the vicinity of borings UV-1 through UV-13 would not likely be classified as a California-hazardous waste and could be disposed of as such or re-used on-site as clean fill material. Soil generated in the vicinity of borings UV-14 through UV-17 would likely be classified as a California-hazardous waste. This soil could be disposed of as a California-hazardous waste or be re-used on-site in accordance with the Department of Toxic Substances Control (DTSC) variance.

In addition, representative lead concentrations in on-site soil are less than the EPA Region IX Preliminary Remediation Goal (PRG) of 750 mg/kg for industrial soil. Therefore, it is concluded that lead-impacted soil in the areas investigated does not pose a significant risk to the health of workers performing the construction activities.

SITE INVESTIGATION REPORT

1.0 INTRODUCTION

This Site Investigation Report for the proposed Union Valley Parkway Interchange on Route 101 was prepared under Caltrans Contract No. 43A0012 and Task Order (TO) No. 05-446010-GL.

1.1 Site Description and Proposed Improvements

The project is located on Route 101 in the unincorporated Orcutt Y area just south of the Santa Maria Way Undercrossing. The approximate site location is also depicted on the attached Vicinity Map, Figure 1.

It is understood that Caltrans will build an overcrossing to connect Union Valley Parkway with Route 101. The project will involve the construction of the overcrossing and associated on-ramps and off-ramps.

1.2 Purpose

The purpose of the work outlined in Task Order (TO) No. 05-446010-GL was to evaluate the extent of lead-impacted soil within the extents of proposed excavation boundaries. The results of this investigation will be used to inform the construction contractor regarding the potential presence of lead-impacted soil and to characterize soil at the site.

2.0 BACKGROUND

2.1 Potential Lead Impacts

Ongoing testing by Caltrans has indicated that aerial deposited lead exists along major freeway routes due to emissions from vehicles powered by leaded gasoline. Caltrans reports that total lead concentrations in soil adjacent to the freeways have typically ranged between 50 and 3,000 milligrams per kilogram (mg/kg). At sites where soil has not been disturbed, the aerial deposited lead is generally limited to the upper 0.6 meter (2 feet) of soil within unpaved shoulder and median areas.

2.2 Hazardous Waste Determination Criteria

Regulatory criteria to classify a waste as "California hazardous" for handling and disposal purposes are contained in the *California Code of Regulations (CCR)*, Title 22, Division 4.5, Chapter 11, Article 3, §66261.24. Criteria to classify a waste as "Resource, Conservation, and Recovery Act (RCRA) hazardous" are contained in Chapter 40 of the Code of Federal Regulations (40 CFR), Section 261.

For a waste containing metals, the waste is classified as California hazardous when: 1) the total metal content exceeds the respective Total Threshold Limit Concentration (TTLC); or 2) the soluble metal content exceeds the respective Soluble Threshold Limit Concentration (STLC) based on the standard Waste Extraction Test (WET). A waste has the potential of exceeding the STLC when the waste's total metal content is greater than or equal to ten times the respective STLC value since the WET uses a 1:10 dilution ratio. Hence, when a total metal is detected at a concentration greater than or equal to ten times the respective STLC, and assuming that 100 percent of the total metals are soluble, soluble metal analysis is required. A material is classified as RCRA hazardous, or Federal hazardous, when the soluble metal content exceeds the Federal regulatory level based on the Toxicity Characteristic Leaching Procedure (TCLP).

The above regulatory criteria are based on chemical concentrations. Wastes may also be classified as hazardous based on other criteria such as ignitability; however, for the purposes of this investigation, toxicity (i.e., lead concentrations) is the primary factor considered for waste classification since waste generated during the construction activities would not likely warrant testing for ignitability or other criteria. Waste that is classified as either California hazardous or RCRA hazardous requires management as a hazardous waste.

Per Section 25157.8 of the California Health and Safety Code (HSC), on or after January 1, 1999, no person shall dispose waste that contains total lead in excess of 350 mg/kg to land other than a Class I

hazardous waste disposal facility. This new requirement applies if surplus soil is generated for off-site disposal.

2.3 DTSC Variance

The Department of Toxic Substances Control (DTSC) issued a variance on September 22, 2000 for select Caltrans Districts regarding the disposition of aerial deposited lead-impacted soils within Caltrans projects. While, as of the date of this report, the DTSC has not issued a variance for Caltrans District 5, Caltrans District 5 has applied for the variance. Review of the variance indicates the following conditions regarding Caltrans' reuse and management of aerial lead impacted soil as fill material for construction and maintenance operations.

Category 1:

Soil exhibiting soluble lead concentrations less than or equal to 0.5 milligrams per liter (mg/l) [based on a modified waste extraction test using deionized water as the extractant (WET-DI)] and total lead concentrations of 350 mg/kg or less may be used as fill provided that the lead-impacted soil is placed a minimum of 1.5 meters (5 feet) above the maximum water table elevation and covered with at least 0.3 meter (1 foot) of clean soil.

Category 2:

Soil exhibiting soluble lead concentrations greater than 0.5 mg/l and less than 50 mg/l (based on the WET-DI) and total lead concentrations less of 350 mg/kg or less may be used as fill provided that the lead-impacted soil is placed a minimum of 1.5 meters (5 feet) above the maximum water table elevation and protected from infiltration by a pavement structure maintained by Caltrans.

Category 3:

Lead-impacted soil with a pH less than 5.0 shall only be used as fill material under the paved portion of the roadway.

If the excavated soil is not intended to be reused within the Caltrans right-of-way, then hazardous waste determination of the soil is based the criterion summarized in Section 2.2.

3.0 SCOPE OF SERVICES

The following scope of services was performed as requested by Caltrans in TO No. 05-446010-GL:

3.1 Pre-Field Activities

- A Task Order Meeting was conducted on-site prior to the commencement of the field activities. The purpose of the meeting was to become familiar with the site layout, to review proposed boring locations, and to address worker and public safety issues.
- A Health and Safety Plan was prepared to provide guidelines on the use of personal protective equipment and the health and safety procedures to be implemented during the field activities.
- A Workplan, dated February 23, 2001, was prepared to summarize the scope of services to be performed by Geocon.
- Geocon provided 48-hour notification to Underground Service Alert prior to commencement of the field activities.
- Geocon retained the services of Advanced Technology Laboratories (ATL), a California-licensed laboratory, to provide the laboratory analyses.

3.2 Field Activities

On February 26, 2001, 20 borings were advanced utilizing a hand auger along the northbound and southbound shoulders of Route 101. The approximate boring locations are depicted on the Site Plan, presented as Figure 2. Note that borings UV-6A through UV-6D were advanced approximately 5, 15, 25, and 35 feet from the edge of pavement to evaluate the lateral extent of potentially lead-impacted soil. All other borings were advanced at approximately 5 feet from the edge of pavement to evaluate the vertical extent of potentially lead-impacted soil. Soil samples were collected from each boring at the ground surface and from depths of approximately 0.3, 0.6, and 0.9 meter (1, 2, and 3 feet) below the ground surface (bgs).

4.0 INVESTIGATIVE METHODS

4.1 Borehole Location Rationale

The soil borehole locations were designated by Caltrans in areas where excavation activities will occur.

4.2 Sampling Procedures

The soil samples were transferred from the hand auger into re-sealable plastic bags. The bags were labeled and placed in containers for transport to the analytical laboratory.

Completed borings were backfilled to surface grade with soil cuttings. The soil samples were transported to Advanced Technology Laboratories, a California-certified environmental laboratory, utilizing standard chain-of-custody documentation.

Sampling equipment was cleansed between each soil borehole by washing the equipment with an Alconox solution followed by two successive rinses with distilled water. The fieldwork was performed under the direct supervision of Geocon's project manager.

4.3 Laboratory Analyses

As required by the subject TO, Geocon instructed the analytical laboratory to perform laboratory analyses under standard turn-around-time. Reproductions of the laboratory reports and chain-of-custody documentation are presented as Appendix A. The laboratory analyses performed are summarized below:

- All soil samples were analyzed for total lead following EPA Test Method 6010;
- Eight soil samples, chosen at random, were tested for soil pH following EPA Test Method 9045;
- Thirteen soil samples that exhibited total lead concentrations greater than ten times the lead STLC of 5.0 mg/l and less than the lead TTLC of 1,000 mg/kg were analyzed for soluble lead via the WET following EPA Test Method 7420; and
- Thirteen soil samples that exhibited soluble (WET) lead concentrations greater than the lead STLC of 5.0 mg/l were re-analyzed for soluble lead via the WET-DI following EPA Test Method 7420.

QA/QC procedures were performed for each method of analysis with specificity for each analyte listed in the test method's QA/QC. The laboratory QA/QC procedures included the following:

- One method blank for every ten samples, batch of samples or type of matrix, whichever was more frequent.
- One sample analyzed in duplicate for every ten samples, batch of samples or type of matrix, whichever was more frequent.
- One spiked sample for every ten samples, batch of samples or type of matrix, whichever was more frequent, with spike made at ten times the detection limit or at the analyte level.
- One laboratory control sample for every instrument operation to check the standard used in the calibration curve.

Prior to submitting the soil samples to the laboratory, the chain-of-custody documentation was reviewed for accuracy and completeness.

5.0 FIELD OBSERVATIONS AND INVESTIGATIVE RESULTS

5.1 Site Geology and Hydrogeology

Soil encountered during the field activities generally consisted of fine to medium sand and gravelly sand to the maximum depth of exploration, approximately 0.9 meter (3 feet) bgs. Groundwater was not encountered during the advancement of the boreholes.

5.2 Soil Analytical Results

A summary of the analytical laboratory test results for soil pH, total lead, and soluble lead for the soil samples collected along the median is presented as Table 1. The laboratory report indicated the following:

- Soil pH values ranged from 5.52 to 8.96.
- Total lead concentrations ranged from less than the laboratory reporting limit of 5 mg/kg to 350 mg/kg.
- Fourteen of the 80 soil samples analyzed for total lead exhibited total lead concentrations greater than ten times the lead STLC of 5.0 mg/l and less than the lead TTLC of 1,000 mg/kg.
- Soluble lead (WET) concentrations ranged from 4.8 mg/l to 27 mg/l. Twelve of the 13 soil samples analyzed for soluble lead via the WET exhibited soluble lead concentrations greater than the lead STLC of 5.0 mg/l.
- Soluble lead (WET-DI) concentrations ranged from less than the laboratory reporting limit of 0.15 mg/l to 2.6 mg/l

5.3 Statistical Evaluation for Lead Detected in Soil Samples

Statistical methods were applied to the total and soluble lead data to evaluate: 1) the distribution of the total lead data; 2) the upper one-sided confidence limits (UCLs) on the true means of the total lead concentrations for each sampling depth; and 3) if an acceptable correlation between total and soluble lead concentrations exists that would allow the prediction of soluble lead concentrations based on calculated UCLs. The statistical methods used to calculate the UCLs are provided in an EPA document entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Third Edition (SW-846)* as recommended by Julia Turney with Caltrans. The statistical methods for evaluating the correlation between total and soluble (WET) lead are provided in *Statistics and Data Analysis in Geology*, by John Davis.

5.3.1 Total Lead Distribution

The presence of nondetects and/or low concentrations in total lead data can strongly skew sample data towards low values. Classical statistical methods do not work properly in these cases since they assume that the data exhibits an underlying normal distribution. Consequently, it is necessary to evaluate the distribution of the total lead data to apply the appropriate methods when determining the UCLs on the true total lead means. When evaluating the distribution of total lead concentrations, each sampling depth was treated as a separate data set.

The total lead mean was greater than the total lead variance for each data set. According to SW-846, if the variance is greater than the mean, the total lead data may be characterized by a negative binomial distribution, as is the case for the data sets obtained from the subject site. In this circumstance, according to SW-846, normality can often be achieved by transforming data by the arcsine transformation. Consequently, each total lead data set was converted into decimal form by dividing the total lead concentrations by the maximum total lead concentration observed in each data set. This resulted in fractionalized total lead concentrations that ranged from close to zero to 1. The fractionalized data was then transformed by taking the arcsine of the fractionalized data. UCLs were calculated in the next section using the transformed data.

5.3.2 Calculating the UCLs for the True Mean

The upper one-sided 90% and 95% confidence limits (UCLs) of the true mean are defined as the values that, when calculated repeatedly for randomly drawn subsets of site data, equal or exceed the true mean 90% and 95% of the time, respectively. According to a statistics guidance letter prepared by Caltrans and dated February 5, 1998, the 90% UCL (80% confidence interval) is applicable if the soil will be re-used on-site, and the 95% UCL (90% confidence interval) is applicable if the soil will be relinquished to the contractor for re-use or disposal.

Statistical confidence limits are the classical tool for addressing uncertainties of a distribution mean. The UCLs of the true mean concentration are used as the mean concentrations because it is not possible to know the true mean due to the essentially infinite number of soil samples that could be collected from the site. The UCLs therefore account for uncertainties due to limited sampling data. As data become less limited at a site, uncertainties decrease and the UCLs move closer to the true mean.

Procedures for obtaining the UCLs on the true means for a negative binomial distribution were used as described in Chapter 9 of SW-846. Note that since borings UV-14 through UV-17 exhibited elevated levels of lead with respect to soil samples collected from other borings. Consequently the data were

divided into two areas and UCLs were calculated for each data set at each area. The resulting UCLs allowed for the evaluation of total lead concentrations vertically as summarized in the following tables:

ENTIRE SITE - Total Lead UCLs

Depth	90% UCL	95% UCL
Surface	46 mg/kg	49 mg/kg
0.3 meter (1 foot)	136 mg/kg	149 mg/kg
0.6 meter (2 feet)	77 mg/kg	86 mg/kg
0.9 meter (3 feet)	86 mg/kg	99 mg/kg

SITE NOT INCLUDING BORINGS UV-14 THRU UV-17 - Total Lead UCLs

Depth	90% UCL	95% UCL
Surface	43 mg/kg	45 mg/kg
0.3 meter (1 foot)	83 mg/kg	95 mg/kg
0.6 meter (2 feet)	74 mg/kg	86 mg/kg
0.9 meter (3 feet)	22 mg/kg	26 mg/kg

ONLY BORINGS UV-14 THRU UV-17 - Total Lead UCLs

Depth	90% UCL	95% UCL
Surface	76 mg/kg	82 mg/kg
0.3 meter (1 foot)	298 mg/kg	309 mg/kg
0.6 meter (2 feet)	138 mg/kg	161 mg/kg
0.9 meter (3 feet)	304 mg/kg	340 mg/kg

Utilizing the UCLs above, the four following excavation scenarios were evaluated :

- Excavation Scenario 1: Excavate the top 0.3 meter (1 foot) of soil.
- Excavation Scenario 2: Excavate the top 0.6 meter (2 feet) of soil.
- Excavation Scenario 3: Excavate the top 0.76 meter (2.5 feet) of soil.
- Excavation Scenario 4: Excavate the top 0.9 meter (3 feet) of soil.

To evaluate expected total lead concentrations for the different excavation scenarios weighted averages of respective UCLs in the tables above were calculated based on the soil mass in question. The UCLs for different excavation scenarios are presented as A portion of Table 2. The calculations are summarized as a portion of Appendix B.

5.3.3 Correlation of Total and Soluble Lead

Total and corresponding soluble (WET) lead concentrations are bivariate data with a linear structure. This linear structure should allow for the prediction of soluble lead (WET) concentrations based on the UCLs calculated above in Section 5.3.2.

To estimate the degree of interrelation between total and corresponding soluble (WET) lead values (x and y , respectively), the *correlation coefficient* [r] is used (see Davis pg. 40). The correlation

coefficient is a ratio that ranges from +1 to -1. A *correlation coefficient* of +1 indicates a perfect direct relationship between two variables; a *correlation coefficient* of -1 indicates that one variable changes inversely with relation to the other. Between the two extremes is a spectrum of less-than-perfect relationships, including zero, which indicates the lack of any sort of linear relationship at all. According to the previously-referenced Caltrans statistics guidance letter, a *correlation coefficient* greater than or equal to 0.8, is an acceptable indicator that a correlation exists.

The *correlation coefficient* was calculated for all (x, y) data points (i.e., soil samples analyzed for both total lead [x] and soluble [WET] lead [y]) and was less than 0.8. The data was reviewed and ten of the data points had a soluble lead (WET) concentration greater than one-tenth of the total lead concentration. Consequently, since these data points are not theoretically possible, the laboratory re-analyzed these ten samples for total and soluble lead using the same aliquot. Upon review of the re-analysis results, two samples still exhibited soluble (WET) lead concentrations greater than one-tenth of the total lead concentration. For purposes of the regression analysis, the soluble (WET) lead concentrations for these two samples were set as one-tenth of the corresponding total lead concentration. The *correlation coefficient* was then re-calculated and equaled 0.8. Consequently, an acceptable correlation between total and soluble lead concentrations exists.

Since the *correlation coefficient* indicates that linear relationships between total and soluble (WET) lead concentrations exist, it is possible to compute the lines of dependence, or best-fit lines between the two variables for the median and soundwalls. Following methods outlined in Davis (pg. 180), a least squares method was used to find the equation of best-fit lines (regression line) by forcing the y-intercept equal to zero since that is a known point. The equation of the regression line was determined to be $y = 0.0698(x)$, where x represents total lead concentrations and y represents predicted soluble lead (WET) concentrations.

This equation was used to estimate the expected soluble lead (WET) concentrations for the UCLs calculated in Section 5.3.2. Regression analysis results and a scatter plot depicting the (x, y) data points along with the regression line are included as a portion of Appendix B. In addition, the expected soluble lead concentrations are shown next to the UCLs in Table 2.

6.0 CONCLUSIONS

The following sections summarize the total lead UCLs, predicted soluble (WET) lead concentrations that correspond with the UCLs, and the waste classification for soil generated for the different excavation scenarios discussed in Section 5.3.2. In addition, the re-use of soil excavated for each scenario has been evaluated based on DTSC requirements for the Caltrans variance. It is likely that if the DTSC grants a variance to Caltrans District 5 the re-use options will be similar.

6.1 Soil for Entire Site

The following table summarizes how soil waste generated is expected to be classified if areas are not segregated and if soil re-use is not an option.

**Table 6.1A
Excavation Scenarios if Soil from the Entire Site Will be Disposed of as a Waste**

Excavation Scenario	95% UCL	Predicted Soluble Lead (WET)	Waste Classification
Scenario 1			
Excavate top 0.3 m (1 ft)	49 mg/kg	3.4 mg/l	Non-hazardous
Underlying Soil (1 to 3 ft)	121 mg/kg	8.4 mg/l	California-hazardous
Scenario 2			
Excavate top 0.6 m (2 ft)	99 mg/kg	6.9 mg/l	California-hazardous
Underlying Soil (2 to 3 ft)	93 mg/kg	6.5 mg/l	California-hazardous
Scenario 3			
Excavate top 0.76 m (2.5 ft)	97 mg/kg	6.8 mg/l	California-hazardous
Underlying Soil (2.5 to 3 ft)	99 mg/kg	6.9 mg/l	California-hazardous
Scenario 4			
Excavate top 0.9 m (3 ft)	97 mg/kg	6.8 mg/l	California-hazardous

Based on the information in Table 6.1A, if excavations are greater than 0.3 meter (1 foot) in depth (i.e., Excavation Scenarios 2, 3, and 4) the soil would likely be classified as a California-hazardous waste since the predicted soluble (WET) lead concentrations are greater than the lead STLC of 5.0 mg/l. If excavations are less than 0.3 meter (1 foot) in depth (i.e., Excavation Scenario 1) the soil would not likely be classified as a California-hazardous waste and could be disposed of as such.

The following table summarizes how soil waste generated is expected to be classified if areas are not segregated and if the soil will be re-used on-site or within the Route 101 corridor.

**Table 6.1B
Excavation Scenarios if Soil from the Entire Site Will be Re-used**

Excavation Scenario	90% UCL	Predicted Soluble Lead (WET)	Waste Classification
Scenario 1			
Excavate top 0.3 m (1 ft)	46 mg/kg	3.2 mg/l	Non-hazardous
Underlying Soil (1 to 3 ft)	109 mg/kg	7.6 mg/l	California-hazardous (Variance Applicable)
Scenario 2			
Excavate top 0.6 m (2 ft)	91 mg/kg	6.4 mg/l	California-hazardous (Variance Applicable)
Underlying Soil (2 to 3 ft)	81 mg/kg	5.7 mg/l	California-hazardous (Variance Applicable)
Scenario 3			
Excavate top 0.76 m (2.5 ft)	88 mg/kg	6.1 mg/l	California-hazardous (Variance Applicable)
Underlying Soil (2.5 to 3 ft)	86 mg/kg	6.0 mg/l	California-hazardous (Variance Applicable)
Scenario 4			
Excavate top 0.9 m (3 ft)	88 mg/kg	6.1 mg/l	California-hazardous (Variance Applicable)

Based on the information in Table 6.1B, if excavations are greater than 0.3 meter (1 foot) in depth (i.e., Excavation Scenarios 2, 3, and 4), the soil would likely be classified as a California-hazardous waste since the predicted soluble (WET) lead concentrations are greater than the lead STLC. However, since the total lead UCLs are less than the HSC threshold of 350 mg/kg, this soil may be re-used on-site in accordance with the DTSC variance.

If excavations are less than 0.3 meter (1 foot) in depth (i.e., Excavation Scenario 1) the soil would not likely be classified as a California-hazardous waste since the predicted soluble (WET) lead concentration is less than the lead STLC. Consequently, this soil may be re-used as clean fill material.

6.2 Soil in the Vicinity of Borings UV-1 through UV-13

The following table summarizes how soil waste generated is expected to be classified if soil generated in the vicinity of borings UV-1 through UV-13 is segregated from soil generated from the vicinity of borings UV14 through UV17 and if soil re-use is not an option.

**Table 6.2A
Excavation Scenarios if Soil Generated in the Vicinity of Borings UV-1 Through UV-13 Will be Disposed of as a Waste**

Excavation Scenario	95% UCL	Predicted Soluble Lead (WET)	Waste Classification
Scenario 1			
Excavate top 0.3 m (1 ft)	45 mg/kg	3.1 mg/l	Non-hazardous
Underlying Soil (1 to 3 ft)	75 mg/kg	5.2 mg/l	California-hazardous
Scenario 2			
Excavate top 0.6 m (2 ft)	70 mg/kg	4.9 mg/l	Non-hazardous
Underlying Soil (2 to 3 ft)	56 mg/kg	3.9 mg/l	Non-hazardous
Scenario 3			
Excavate top 0.76 m (2.5 ft)	73 mg/kg	5.1 mg/l	California-hazardous
Underlying Soil (2.5 to 3 ft)	26 mg/kg	1.8 mg/l	Non-hazardous
Scenario 4			
Excavate top 0.9 m (3 ft)	65 mg/kg	4.5 mg/l	Non-hazardous

Based on the information in Table 6.2A, if excavations are either 0.3, 0.6, or 0.9 meter (1, 2, or 3 feet) in depth (i.e., Excavation Scenarios 1, 2, and 4) the soil would not likely be classified as a California-hazardous waste since the predicted soluble (WET) lead concentrations are less than the lead STLC of 5.0 mg/l. If excavations are between 0.6 and 0.75 meter (2 and 2.5 feet) in depth (i.e., Excavation Scenario 3) the soil would need to be disposed of at a Class I landfill since the predicted soluble lead concentration is greater than the lead STLC of 5.0 mg/l.

6.3 Soil in the Vicinity of Borings UV-14 through UV-17

The following table summarizes how soil waste generated is expected to be classified if soil generated in the vicinity of borings UV-14 through UV-17 is segregated from soil generated from the vicinity of borings UV1 through UV13 and if soil re-use is not an option.

**Table 6.3A
Excavation Scenarios if Soil Generated in the Vicinity of Borings UV-14 Through UV-17 Will be Disposed of as a Waste**

Excavation Scenario	95% UCL	Predicted Soluble Lead (WET)	Waste Classification
Scenario 1			
Excavate top 0.3 m (1 ft)	82 mg/kg	5.7 mg/l	California-hazardous
Underlying Soil (1 to 3 ft)	280 mg/kg	20 mg/l	California-hazardous
Scenario 2			
Excavate top 0.6 m (2 ft)	195 mg/kg	14 mg/l	California-hazardous
Underlying Soil (2 to 3 ft)	250 mg/kg	17 mg/l	California-hazardous
Scenario 3			
Excavate top 0.76 m (2.5 ft)	189 mg/kg	13 mg/l	California-hazardous
Underlying Soil (2.5 to 3 ft)	340 mg/kg	24 mg/l	California-hazardous
Scenario 4			
Excavate top 0.9 m (3 ft)	214 mg/kg	15 mg/l	California-hazardous

Based on the information in Table 6.3A, soil generated from any excavation scenario would likely be classified as a California-hazardous waste since the predicted soluble (WET) lead concentrations are greater than the lead STLC of 5.0 mg/l. Consequently, the soil would need to be disposed of at a Class I landfill.

The following table summarizes how soil waste generated is expected to be classified if soil generated in the vicinity of borings UV-14 through UV-17 is segregated from soil generated from the vicinity of borings UV1 through UV13 and if the soil will be re-used on-site or within the Route 101 corridor.

Table 6.3B
Excavation Scenarios if Soil Generated in the Vicinity of Borings UV-14 Through UV-17
Will be Re-used

Excavation Scenario	90% UCL	Predicted Soluble Lead (WET)	Waste Classification
Scenario 1			
Excavate top 0.3 m (1 ft)	76 mg/kg	5.3 mg/l	California-hazardous (Variance Applicable)
Underlying Soil (1 to 3 ft)	259 mg/kg	18 mg/l	California-hazardous (Variance Applicable)
Scenario 2			
Excavate top 0.6 m (2 ft)	187 mg/kg	13 mg/l	California-hazardous (Variance Applicable)
Underlying Soil (2 to 3 ft)	221 mg/kg	15 mg/l	California-hazardous (Variance Applicable)
Scenario 3			
Excavate top 0.76 m (2.5 ft)	177 mg/kg	12 mg/l	California-hazardous (Variance Applicable)
Underlying Soil (2.5 to 3 ft)	304 mg/kg	21 mg/l	California-hazardous (Variance Applicable)
Scenario 4			
Excavate top 0.9 m (3 ft)	198 mg/kg	14 mg/l	California-hazardous (Variance Applicable)

Based on the information in Table 6.3B, soil generated from any excavation scenario would likely be classified as a California-hazardous waste since the predicted soluble (WET) lead concentrations are greater than the lead STLC. However, since the total lead UCLs are less than the HSC threshold of 350 mg/kg, this soil may be re-used on-site in accordance with the DTSC variance.

6.4 Risk to Human Health

Based on current and proposed use of the subject site and adjacent properties, it is appropriate to compare the highest calculated UCL to EPA Region 9 Preliminary Remediation Goal (PRG) for lead in industrial soil. PRGs are used to estimate contaminant concentrations in environmental media (soil, air, and water) that are protective of human health, including sensitive groups, over a lifetime. The total lead PRG for industrial soil is 750 mg/kg. Total lead concentrations above the PRG would not automatically trigger a response action or suggest that a significant risk to human health exists. Exceeding a PRG does suggest that further evaluation of the potential risks that may be posed by site contaminants is appropriate.

The highest UCL of 340 mg/kg is less than the PRG of 750 mg/kg. Therefore, it is concluded that lead-impacted soil in the areas investigated does not pose a significant risk to the health of workers performing the construction activities.

7.0 REPORT LIMITATIONS

This report has been prepared exclusively for Caltrans. The information contained herein is only valid as of the date of the report, and will require an update to reflect additional information obtained.

This report is not a comprehensive site characterization and should not be construed as such. The findings as presented in this report are predicated on the results of the limited sampling and laboratory testing performed. In addition, the information obtained is not intended to address potential impacts related to sources other than those specified herein. Therefore, the report should be deemed conclusive with respect to only the information obtained. We make no warranty, express or implied, with respect to the content of this report or any subsequent reports, correspondence or consultation. Geocon strived to perform the services summarized herein in accordance with the local standard of care in the geographic region at the time the services were rendered.

TABLE 1
SUMMARY OF ANALYTICAL LABORATORY TEST RESULTS
ROUTE 101 - PROPOSED UNION VALLEY PARKWAY INTERCHANGE

Total Lead - EPA Test Method 6010
Soluble Lead (WET and WET-DI) - EPA Test Method 6010
Soil pH - EPA Test Method 9045

Sample ID.	Total Lead (mg/kg)	Soluble Lead -WET (mg/l)	Soluble Lead - WET-DI (mg/l)	pH
UV-1-S	62	5.9	< 0.15	---
UV-1-1	7.2	---	---	---
UV-1-2	< 5	---	---	7.92
UV-1-3	< 5	---	---	---
UV-2-S	34	---	---	---
UV-2-1	24	---	---	---
UV-2-2	6.9	---	---	---
UV-2-3	< 5	---	---	---
UV-3-S	41	---	---	---
UV-3-1	36	---	---	---
UV-3-2	11	---	---	---
UV-3-3	< 5	---	---	---
UV-4-S	44	---	---	8.80
UV-4-1	19	---	---	---
UV-4-2	11	---	---	---
UV-4-3	< 5	---	---	---
UV-5-S	46	---	---	---
UV-5-1	< 5	---	---	---
UV-5-2	< 5	---	---	---
UV-5-3	< 5	---	---	---
UV-6A-S	75	4.8	< 0.15	---
UV-6A-1	< 5	---	---	---
UV-6A-2	< 5	---	---	5.78
UV-6A-3	< 5	---	---	---
UV-6B-S	39	---	---	---
UV-6B-1	31	---	---	---
UV-6B-2	7.1	---	---	---
UV-6B-3	< 5	---	---	---

TABLE 1
SUMMARY OF ANALYTICAL LABORATORY TEST RESULTS
ROUTE 101 - PROPOSED UNION VALLEY PARKWAY INTERCHANGE

Total Lead - EPA Test Method 6010
Soluble Lead (WET and WET-DI) - EPA Test Method 6010
Soil pH - EPA Test Method 9045

Sample ID.	Total Lead (mg/kg)	Soluble Lead -WET (mg/l)	Soluble Lead - WET-DI (mg/l)	pH
UV-6C-S	48	---	---	---
UV-6C-1	15	---	---	---
UV-6C-2	< 5	---	---	---
UV-6C-3	< 5	---	---	---
UV-6D-S	12	---	---	---
UV-6D-1	< 5	---	---	---
UV-6D-2	< 5	---	---	5.59
UV-6D-3	< 5	---	---	---
UV-7-S	17	---	---	---
UV-7-1	< 5	---	---	---
UV-7-2	< 5	---	---	---
UV-7-3	< 5	---	---	---
UV-8-S	25	---	---	---
UV-8-1	9.2	---	---	---
UV-8-2	< 5	---	---	5.52
UV-8-3	< 5	---	---	---
UV-9-S	11	---	---	---
UV-9-1	42	---	---	---
UV-9-2	< 5	---	---	---
UV-9-3	< 5	---	---	---
UV-10-S	6.5	---	---	---
UV-10-1	290	24	1.3	---
UV-10-2	5.2	---	---	---
UV-10-3	< 5	---	---	---
UV-11-S	19	---	---	8.96
UV-11-1	30	---	---	---
UV-11-2	250	14	0.72	---
UV-11-3	110	10	< 0.15	---

TABLE 1
SUMMARY OF ANALYTICAL LABORATORY TEST RESULTS
ROUTE 101 - PROPOSED UNION VALLEY PARKWAY INTERCHANGE

Total Lead - EPA Test Method 6010
Soluble Lead (WET and WET-DI) - EPA Test Method 6010
Soil pH - EPA Test Method 9045

Sample ID.	Total Lead (mg/kg)	Soluble Lead -WET (mg/l)	Soluble Lead - WET-DI (mg/l)	pH
UV-12-S	11	---	---	---
UV-12-1	45	---	---	---
UV-12-2	< 5	---	---	---
UV-12-3	< 5	---	---	---
UV-13-S	30	---	---	---
UV-13-1	14	---	---	---
UV-13-2	< 5	---	---	6.85
UV-13-3	< 5	---	---	---
UV-14-S	25	---	---	---
UV-14-1	310	27	2.6	---
UV-14-2	12	---	---	---
UV-14-3	< 5	---	---	---
UV-15-S	< 5	---	---	---
UV-15-1	140	18	1.0	---
UV-15-2	95	8.0	< 0.15	---
UV-15-3	42	---	---	---
UV-16-S	83	5.6	< 0.15	7.27
UV-16-1	54	11	1.5	---
UV-16-2	26	---	---	---
UV-16-3	350	14	< 0.15	---
UV-17-S	38	---	---	---
UV-17-1	250	18	0.42	---
UV-17-2	170	15	< 0.15	---
UV-17-3	< 5	---	---	---

Notes:

mg/kg = milligrams per kilogram

mg/l = milligrams per liter

--- = Analysis not performed

**TABLE 2
LEAD STATISTICS
ROUTE 101 - PROPOSED UNION VALLEY PARKWAY INTERCHANGE**

UCLs for the Total Lead Mean (per SW-846) and Their Predicted Soluble (WET) Lead Concentrations

Entire Site

Excavation Scenario	90% UCL* (mg/kg)	Predicted Soluble Lead (mg/l)	95% UCL** (mg/kg)	Predicted Soluble Lead (mg/l)
Surface to 1 foot	46	3.2	49	3.4
<i>Underlying soil (1 to 3 feet)</i>	109	7.6	121	8.4
Surface to 2 feet	91	6.4	99	6.9
<i>Underlying soil (2 to 3 feet)</i>	81	5.7	93	6.5
Surface to 2.5 feet	88	6.1	97	6.8
<i>Underlying soil (2.5 to 3 feet)</i>	86	6.0	99	6.9
Surface to 3 feet	88	6.1	97	6.8

Site - Soil in the Vicinity of Borings UV-1 through UV-13

Excavation Scenario	90% UCL* (mg/kg)	Predicted Soluble Lead (mg/l)	95% UCL** (mg/kg)	Predicted Soluble Lead (mg/l)
Surface to 1 foot	43	3.0	45	3.1
<i>Underlying soil (1 to 3 feet)</i>	66	4.6	75	5.2
Surface to 2 feet	63	4.4	70	4.9
<i>Underlying soil (2 to 3 feet)</i>	48	3.4	56	3.9
Surface to 2.5 feet	65	4.5	73	5.1
<i>Underlying soil (2.5 to 3 feet)</i>	22	1.5	26	1.8
Surface to 3 feet	58	4.0	65	4.5

Site - Soil in the Vicinity of Borings UV-14 through UV-17

Excavation Scenario	90% UCL* (mg/kg)	Predicted Soluble Lead (mg/l)	95% UCL** (mg/kg)	Predicted Soluble Lead (mg/l)
Surface to 1 foot	76	5.3	82	5.7
<i>Underlying soil (1 to 3 feet)</i>	259	18	280	20
Surface to 2 feet	187	13	195	14
<i>Underlying soil (2 to 3 feet)</i>	221	15	250	17
Surface to 2.5 feet	177	12	189	13
<i>Underlying soil (2.5 to 3 feet)</i>	304	21	340	24
Surface to 3 feet	198	14	214	15

Notes:

* = According to Julia Turney with at Caltrans' Headquarters. 90% UCL applicable if soil will be reused on-site

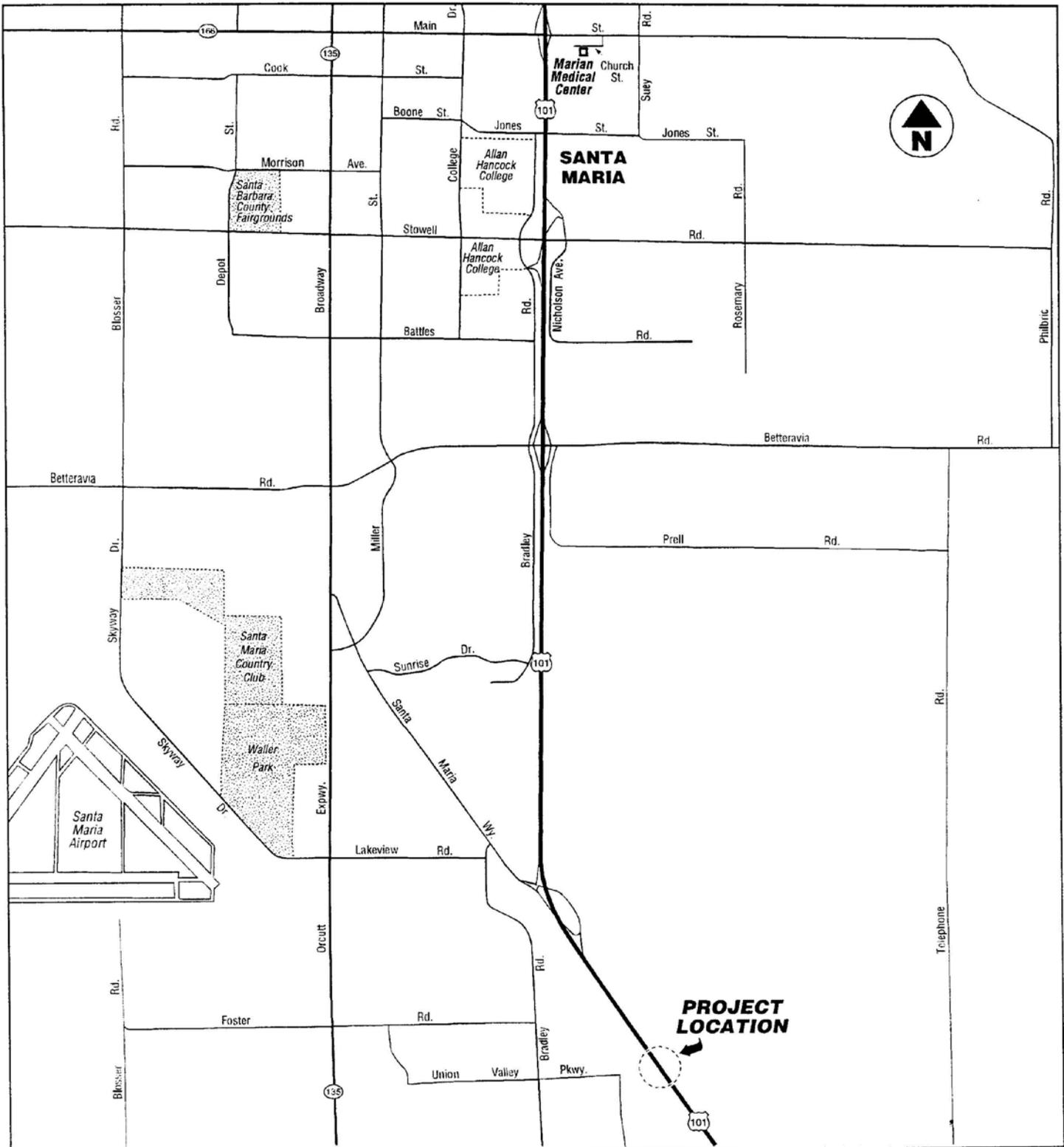
** = According to Julia Turney, 95% UCL applicable if soil will be relinquished to contractor for re-use off-site or disposal

mg/kg = milligrams per kilogram

mg/l = milligrams per liter

Soluble lead concentrations were predicted using the equation of the regression line ($y = 0.0698x$).

Concentrations shown in **bold** are equal to or greater than the lead STLC of 5.0 mg/l.



GEOCON
CONSULTANTS, INC.

5673 WEST LAS POSITAS BLVD. - SUITE 205 - PLEASANTON, CA. 94588
PHONE 925 469-9750 - FAX 925 469-9749



Route 101 - Proposed Union Valley Parkway Overcrossing

Santa Barbara County
Santa Maria, California

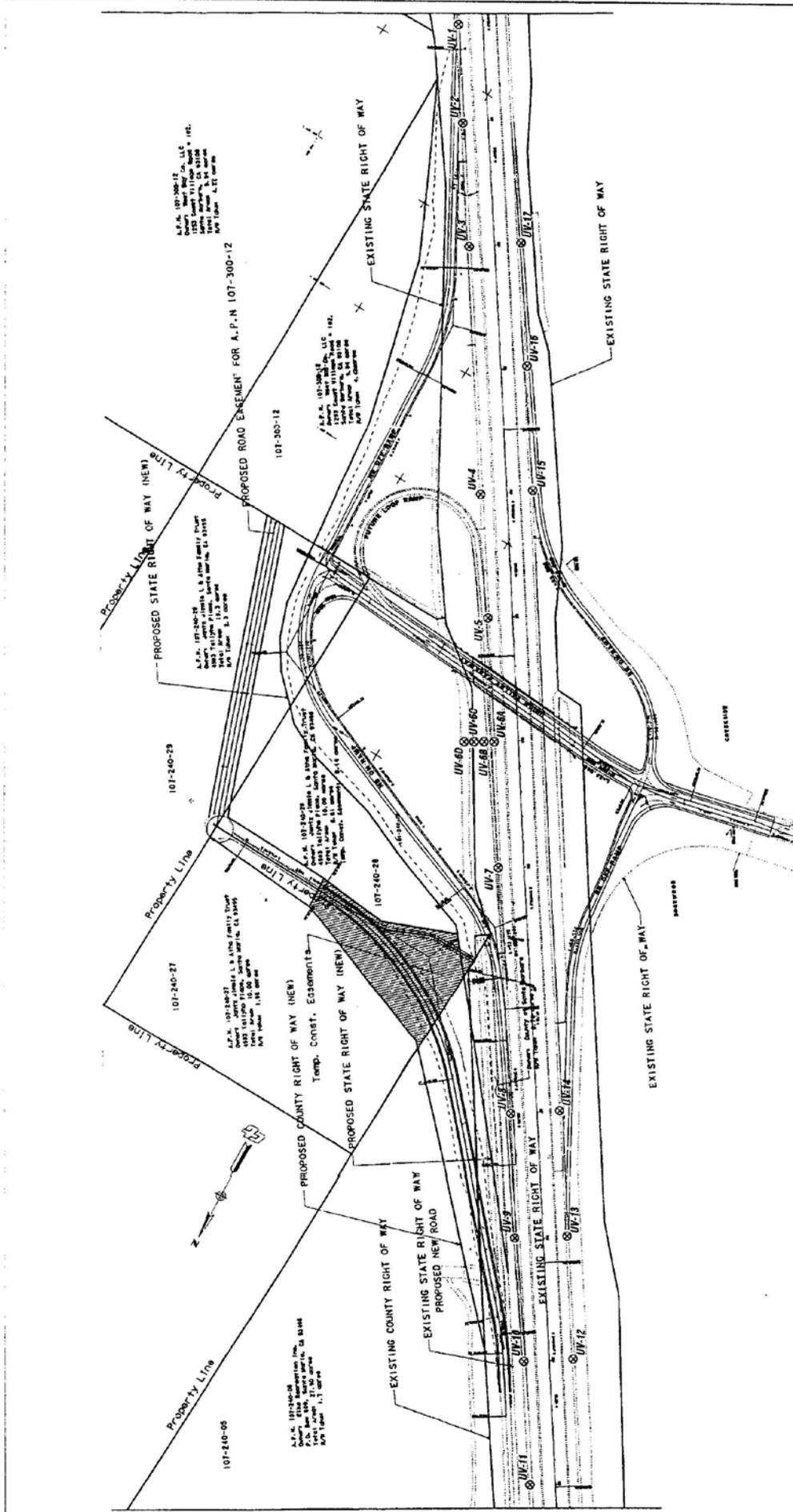
VICINITY MAP

GEOCON Proj. No. E8000-06-58

Task Order No. 05-446010-GL

April 2001

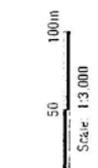
Figure 1



GEOCON
 CONSULTANTS, INC.
 5873 WEST LAS POSITAS BLVD - SUITE 200 - PLEASANTON, CA 94588
 PHONE 925-468-9756 - FAX 925-469-9743

Route 101 - Proposed Union Valley Parkway Overcrossing
 Santa Barbara County
 Santa Maria, California
 GEOCON Proj. No. E8000-06-58

Task Order No. 05-446010-GL
 April 2001
 Figure 2



LEGEND:
 UV-1 @ Approximate Boring Location

APPENDIX

A

April 06, 2001

*Re-analysis
results*

Ross White
Geocon Environmental
5673 W. Las Positas Blvd., Ste 205
Pleasanton, CA 94588
TEL: (925) 469-9750
FAX (925) 469-9749

ELAP No: 1838

RE: Union Valley Pkwy - E8000-06-58

Work Order No.: 049775

Attention: Ross White

Enclosed are the results for sample(s) received on February 28, 2001 by Advanced Technology Laboratories and tested for the parameters indicated in the enclosed chain of custody.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (562)989-4045 if I can be of further assistance to your company.

Sincerely,



Edgar Caballero
Laboratory Director

This cover letter and a case narrative are an integral part of this analytical report.



FAX



Date 3/30/01

Number of pages including cover sheet 1

TO: DIANE
ATL

FROM: Ross J. White
Geocon Consultants, Inc.
5673 W. Las Positas Blvd., Suite 205
Pleasanton, CA 94588

Phone
Fax Phone

Phone 925.469.9750
Fax 925.469.9749

CC:

REMARKS: Urgent For your review Reply ASAP Please Comment

re: Union Valley Pkwy - E8000-06-SB

the majority (10 out of 14) of the soil sample analyzed for soluble (WET) lead exhibited concentrations that don't agree with the total lead concentrations.

Please RE-ANALYZE the following soil samples for total + soluble WET lead using the same aliquot, Standard TAT

- UV-6A-5 (049775-021A)
- UV-10-1 - 050A
- UV-11-2 - 055A
- UV-15-1 - 070A
- UV-15-2 - 071A
- UV-16-1 - 074A
- UV-16-3 - 076A
- UV-17-1 - 078A
- UV-17-2 - 079A
- UV-17-3 - 080A

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY:

Advanced Technology Laboratories
 1510 E. 33rd Street
 Signal Hill, CA 90807
 (562) 989-4045 • FAX (562) 989-4040

Client: GEDCON
 Attn: R. WHITE
 Project Name: UNION VALLEY PKWY
 Relinquished by: (Signature and Printed Name) [Signature]
 Relinquished by: (Signature and Printed Name) [Signature]
 Relinquished by: (Signature and Printed Name) [Signature]

P.O.#: _____
 Logged By: _____ Date: _____ Time: _____
 Method of Transport: Walk-in Courter UPS FED. EXP. ATL
 Sample Condition Upon Receipt: 1. CHILLED 4. SEALED Y N 2. HEADSPACE (VOA) 5. # OF SPLS MATCH COC Y N 3. CONTAINER INTACT 6. PRESERVED Y N

Address: 5673 W. LAS POSITAS BL, # 205 TEL: (925) 469-9750
 City: PLEASANTON State: CA Zip Code: 94588 FAX: () () 9749
 Project #: E8000-06-58 Sampler: D. WATTS
 Date: 2/27/01 Time: 1000 Received by: (Signature and Printed Name) [Signature]
 Date: _____ Time: _____
 Date: _____ Time: _____
 Date: _____ Time: _____

Bill To: _____ Attn: _____
 Co: SEE "CLIENT" Address: _____ City: _____ State: _____ Zip: _____
 Circle or Add Analysis(es) Requested: 801 / 802 (Pesticides/PCB-GC) 825 / 8270 (BNA-GCMS) 8015M TPH/GBTEX (COMBINATION) 8015M TPHD (DISS-GC) TOTAL PH (6/01)

Special Instructions/Comments:
LAB RANDOMLY SELECT 10% FOR PH ANALYSES USING EPA 9045. (S= SURFACE) (SEE ATTACHED INSTRUCTIONS)
Do NOT COMPOSITE SAMPLE SETS

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description	Sample I.D.	Date	Time	PRESERVATION			REMARKS
						Container #	Type	Container(s)	
	UV-1-5, 1, 2, 3			2/24/01	1315				
	UV-2-				1320				
	UV-3-				1325				
	UV-4-				1330				
	UV-5-				1345				
	UV-6A-				1350				
	UV-6A-				1400				
	UV-6B-				1405				
	UV-6C-				1410				
	UV-6D-				1420				

Matrix: RTNE RWQCB WIP NAVY CT OTHER
 Matrix: AIR • FILTER WIFE • FILTER DRINKING WATER WATER • WASTEWATER OIL • SOLVENT • LIQUID SOLID SOIL • SLUDGE

TAT: A= Overnight ≤ 24 hr, B= Emergency Next workday, C= Critical 2 Workdays, D= Urgent 3 Workdays, E= Routine 7 Workdays
 Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal
 Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C Z=Zn(AC)₂ O=NaOH T=Na₂S₂O₃

DISTRIBUTION: White with report, Yellow to folder, Pink to submitter.

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY:

Advanced Technology Laboratories
 1510 E. 33rd Street
 Signal Hill, CA 90807
 (562) 989-4045 • FAX (562) 989-4040

Client: GECON
 Attn: R. WHITE
 Project Name: UNION VALLEY HWY
 Project #: E8000-06-58
 Sampler: P. WATTS
 Relinquished by: (Signature and Printed Name) [Signature]
 Relinquished by: (Signature and Printed Name) [Signature]
 Relinquished by: (Signature and Printed Name) [Signature]

Method of Transport: Walk-in Courier UPS FED. EXP. ATL
 Sample Condition Upon Receipt: 1. CHILLED 2. HEADSPACE (VOA) 3. CONTAINER INTACT 4. SEALED 5. # OF SPLS MATCH COC 6. PRESERVED

Logged By: _____ Date: _____ Time: _____
 Address: See pg 1 City: _____ State: _____ Zip Code: _____
 Date: 7/27/01 Time: 1000
 Date: 7/27/01 Time: 1000
 Date: _____ Time: _____

Bill To: _____ Attn: _____
 Co: _____ Address: _____ City: _____ State: _____ Zip: _____
 Special Instructions/Comments: SEE PG 1

Send Report To: _____ Attn: _____
 Address: _____ City: _____ State: _____ Zip: _____
 Project Mgr / Submitter: See Date: _____
 Signature: _____

LAB USE ONLY: Batch #	Lab No.	Sample Description	Sample I.D.	Date	Time	CIRCLE APPROPRIATE MATRIX		PRESERVATION	REMARKS
						RTNE	RWQCB		
UV-17	14123	UV-17 - 5,12,3	14123	7/26/01	1425	X	WATER • WASTEWATER	E 4 P N	
UV-8		UV-8 -			1430		DRINKING WATER		
UV-9		UV-9 -			1435		AIR		
UV-10		UV-10 -			1440		WATER • WASTEWATER		
UV-11		UV-11 -			1445		WATER • WASTEWATER		
UV-12		UV-12 -			1450		WATER • WASTEWATER		
UV-13		UV-13 -			1451		WATER • WASTEWATER		
UV-14		UV-14 -			1453		WATER • WASTEWATER		
UV-15		UV-15 -			1458		WATER • WASTEWATER		
UV-16		UV-16 -			1500		WATER • WASTEWATER		

9081 / 9082 (Pesticides/PCB-GC)
 8250 (Volatiles-GCMS)
 825 / 8270 (BNA-GCMS)
 8015M TPHG/TEX (COMBINATION)
 8015M TPHD (Diesel-GC)
 TOTAL Pb (Pb)

* \$10.00 FEE PER HAZARDOUS SAMPLE DISPOSAL.
 Sample Archive/Disposal: Laboratory Standard Other Return To: _____

TAT: A = Overnight ≤ 24 hr
 B = Emergency Next workday
 C = Critical 2 Workdays
 D = Urgent 3 Workdays
 E = 7 Workdays
 Routine

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal
 Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C Z=Zn(AC)₂ O=NaOH T=Na₂S₂O₃

Advanced Technology Laboratories

Date: 10-Apr-01

CLIENT: Geocon Environmental
Project: Union Valley Pkwy - E8000-06-58
Lab Order: 049775

CASE NARRATIVE

Samples 049775-021A, 049775-050A, 049775-055A, 049775-070A, 049775-071A, 049775-074A, 049775-076A, 049775-078A, 049775-079A and 049775-080A were re-analyzed for Total and Soluble Lead per your request.

The reanalysis of Total and Soluble Lead for sample 049775-080A exhibits sample non-homogeneity.



Advanced Technology Laboratories

Print Date: 4/6/01

CLIENT: Geocon Environmental
 Lab Order: 049775
 Project: Union Valley Pkwy - E8000-06-58
 Lab ID: 049775-021A

Client Sample ID: UV-6A-S

Collection Date: 2/26/01

Matrix: Soil

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
LEAD BY ICP		EPA 6010B			Analyst: EFR	
RunID: ICP3_010402B	BatchID: 3583					PrepDate: 4/2/01
Lead	75	5.0		mg/Kg	1	4/2/01
Lead	51	5.0		mg/Kg	1	3/2/01
LEAD BY ATOMIC ABSORPTION		WET/ EPA 7420			Analyst: NS	
RunID: AA2_010405A	BatchID: 3592			Solid/ STLC Extract		PrepDate: 4/2/01
Lead	4.8	0.15		mg/L	1	4/5/01
Lead	7.3	0.15		mg/L	1	3/12/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 



Advanced Technology Laboratories

Print Date: 4/6/01

CLIENT: Geocon Environmental
 Lab Order: 049775
 Project: Union Valley Pkwy - E8000-06-58
 Lab ID: 049775-050A

Client Sample ID: UV-10-1
 Collection Date: 2/26/01
 Matrix: Soil

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
LEAD BY ICP		EPA 6010B			Analyst: EFR	
RunID: ICP3_010402B	BatchID: 3583					PrepDate: 4/2/01
Lead	290	5.0		mg/Kg	1	4/2/01
Lead	190	5.0		mg/Kg	1	3/3/01
LEAD BY ATOMIC ABSORPTION		WET/ EPA 7420			Analyst: NS	
RunID: AA2_010405A	BatchID: 3592					PrepDate: 4/2/01
		Solid/ STLC Extract				
Lead	24	0.30		mg/L	2	4/5/01
Lead	24	0.30		mg/L	2	3/12/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 



Advanced Technology Laboratories

Print Date: 4/6/01

CLIENT: Geocon Environmental
Lab Order: 049775
Project: Union Valley Pkwy - E8000-06-58
Lab ID: 049775-055A

Client Sample ID: UV-11-2
Collection Date: 2/26/01
Matrix: Soil

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
LEAD BY ICP		EPA 6010B			Analyst: EFR	
RunID: ICP3_010402B	BatchID: 3583					PrepDate: 4/2/01
Lead	250	5.0		mg/Kg	1	4/2/01
Lead	170	5.0		mg/Kg	1	3/3/01
LEAD BY ATOMIC ABSORPTION		WET/ EPA 7420			Analyst: NS	
RunID: AA2_010312A	BatchID: 3332					PrepDate: 3/12/01
		Solid/ STLC Extract				
Lead	24	0.30		mg/L	2	3/12/01
Lead	14	0.15		mg/L	1	4/5/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 



Advanced Technology Laboratories

Print Date: 4/6/01

CLIENT: Geocon Environmental
 Lab Order: 049775
 Project: Union Valley Pkwy - E8000-06-58
 Lab ID: 049775-070A

Client Sample ID: UV-15-1
 Collection Date: 2/26/01
 Matrix: Soil

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
LEAD BY ICP		EPA 6010B			Analyst: EFR	
RunID: ICP3_010402B	BatchID: 3583					PrepDate: 4/2/01
Lead	140	5.0		mg/Kg	1	4/2/01
Lead	130	5.0		mg/Kg	1	3/3/01
LEAD BY ATOMIC ABSORPTION		WET/ EPA 7420			Analyst: NS	
RunID: AA2_010405A	BatchID: 3592			Solid/ STLC Extract		PrepDate: 4/2/01
Lead	18	0.30		mg/L	2	4/5/01
Lead	15	0.15		mg/L	1	3/12/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 



Advanced Technology Laboratories

Print Date: 4/6/01

CLIENT: Geocon Environmental
 Lab Order: 049775
 Project: Union Valley Pkwy - E8000-06-58
 Lab ID: 049775-071A

Client Sample ID: UV-15-2
 Collection Date: 2/26/01
 Matrix: Soil

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
LEAD BY ICP		EPA 6010B			Analyst: EFR	
RunID: ICP3_010402B	BatchID: 3583					PrepDate: 4/2/01
Lead	95	5.0		mg/Kg	1	4/2/01
Lead	92	5.0		mg/Kg	1	3/3/01
LEAD BY ATOMIC ABSORPTION		WET/ EPA 7420			Analyst: NS	
RunID: AA2_010405A	BatchID: 3592			Solid/ STLC Extract		PrepDate: 4/2/01
Lead	8.0	0.15		mg/L	1	4/5/01
Lead	11	0.15		mg/L	1	3/12/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 



Advanced Technology Laboratories

Print Date: 4/10/01

CLIENT: Geocon Environmental **Client Sample ID:** UV-16-1
Lab Order: 049775
Project: Union Valley Pkwy - E8000-06-58 **Collection Date:** 2/26/01
Lab ID: 049775-074A **Matrix:** Soil

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
LEAD BY ICP		EPA 6010B			Analyst: EFR	
RunID: ICP3_010402B	BatchID: 3583					PrepDate: 4/2/01
Lead	54	5.0		mg/Kg	1	4/2/01
Lead	110	5.0		mg/Kg	1	3/3/01
LEAD BY ATOMIC ABSORPTION		WET/ EPA 7420			Analyst: NS	
RunID: AA2_010312A	BatchID: 3333					PrepDate: 3/12/01
		Solid/ STLC Extract				
Lead	18	0.30		mg/L	2	3/12/01
Lead	11	0.15		mg/L	1	4/5/01

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike/Surrogate outside of limits due to matrix interference.
 J - Analyte detected below quantitation limits H - Samples exceeding analytical holding time
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 DO - Surrogate Diluted Out M - Not Monitored. Highly Reactive

Initials:



Advanced Technology Laboratories

Print Date: 4/10/01

CLIENT: Geocon Environmental
Lab Order: 049775
Project: Union Valley Pkwy - E8000-06-58
Lab ID: 049775-076A

Client Sample ID: UV-16-3
Collection Date: 2/26/01
Matrix: Soil

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
LEAD BY ICP		EPA 6010B			Analyst: EFR	
RunID: ICP3_010402B	BatchID: 3583					PrepDate: 4/2/01
Lead	350	5.0		mg/Kg	1	4/2/01
Lead	130	5.0		mg/Kg	1	3/3/01
LEAD BY ATOMIC ABSORPTION		WET/ EPA 7420			Analyst: NS	
RunID: AA2_010312A	BatchID: 3333			Solid/ STLC Extract		PrepDate: 3/12/01
Lead	17	0.30		mg/L	2	3/12/01
Lead	14	0.15		mg/L	1	4/5/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 



Advanced Technology Laboratories

Print Date: 4/10/01

CLIENT: Geocon Environmental **Client Sample ID:** UV-17-1
Lab Order: 049775
Project: Union Valley Pkwy - E8000-06-58 **Collection Date:** 2/26/01
Lab ID: 049775-078A **Matrix:** Soil

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
LEAD BY ICP		EPA 6010B			Analyst: EFR	
RunID: ICP3_010402B	BatchID: 3583					PrepDate: 4/2/01
Lead	250	5.0		mg/Kg	1	4/2/01
Lead	100	5.0		mg/Kg	1	3/3/01
LEAD BY ATOMIC ABSORPTION		WET/ EPA 7420			Analyst: NS	
RunID: AA2_010405A	BatchID: 3592					PrepDate: 4/2/01
				Solid/ STLC Extract		
Lead	18	0.30		mg/L	2	4/5/01
Lead	20	0.30		mg/L	2	3/12/01

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike/Surrogate outside of limits due to matrix interference.
 J - Analyte detected below quantitation limits H - Samples exceeding analytical holding time
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 DO - Surrogate Diluted Out M - Not Monitored. Highly Reactive

Initials: 



Advanced Technology Laboratories

Print Date: 4/6/01

CLIENT: Geocon Environmental
 Lab Order: 049775
 Project: Union Valley Pkwy - E8000-06-58
 Lab ID: 049775-080A

Client Sample ID: UV-17-3
 Collection Date: 2/26/01
 Matrix: Soil

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
LEAD BY ICP		EPA 6010B			Analyst: EFR	
RunID: ICP3_010402B	BatchID: 3583					PrepDate: 4/2/01
Lead	ND	5.0		mg/Kg	1	4/2/01
Lead	110	5.0		mg/Kg	1	3/3/01
LEAD BY ATOMIC ABSORPTION		WET/ EPA 7420			Analyst: NS	
RunID: AA2_010405A	BatchID: 3592			Solid/ STLC Extract		PrepDate: 4/2/01
Lead	ND	0.15		mg/L	1	4/5/01
Lead	0.62	0.15		mg/L	1	3/12/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 



Advanced Technology Laboratories

Print Date: 4/10/01

CLIENT: Geocon Environmental
Lab Order: 049775
Project: Union Valley Pkwy - E8000-06-58
Lab ID: 049775-079A

Client Sample ID: UV-17-2
Collection Date: 2/26/01
Matrix: Soil

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
LEAD BY ICP		EPA 6010B			Analyst: EFR	
RunID: ICP3_010402B	BatchID: 3583					PrepDate: 4/2/01
Lead	170	5.0		mg/Kg	1	4/2/01
Lead	120	5.0		mg/Kg	1	3/3/01
LEAD BY ATOMIC ABSORPTION		WET/ EPA 7420			Analyst: NS	
RunID: AA2_010405A	BatchID: 3592			Solid/ STLC Extract		PrepDate: 4/2/01
Lead	15	0.15		mg/L	1	4/5/01
Lead	14	0.15		mg/L	1	3/12/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 





Advanced Technology Laboratories

CLIENT: Geoen Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Date: 06-Apr-01

QC SUMMARY REPORT
Method Blank

Sample ID	MB-3583	Batch ID:	3583	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	4/2/01	Prep Date:	4/2/01			
MBLK						SeqNo:	114574						
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead		ND			5.0								

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
 M - Not Monitored, Highly Reactive
 S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials: /



Advanced Technology Laboratories

Date: 06-Apr-01

CLIENT: Geoco Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

QC SUMMARY REPORT
Method Blank

Sample ID	MB	Batch ID: 3382	Test Name ICP METALS	Units mg/L	Analysis Date: 3/15/01	Prep Date: 3/13/01					
MBLK				SeqNo: 109394							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	ND	0.10									J
Nickel	ND	0.10									

Sample ID	MB-3382	Batch ID: 3382	Test Name LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date: 3/15/01	Prep Date: 3/13/01					
MBLK				SeqNo: 109600							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.15									

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
 M - Not Monitored. Highly Reactive
 S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:



Advanced Technology Laboratories

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Date: 06-Apr-01

QC SUMMARY REPORT

Sample Duplicate

Sample ID 049775-080A Batch ID: 3583 Test Name LEAD BY ICP

Units mg/Kg Analysis Date: 4/2/01 Prep Date: 4/2/01

DUP

SeqNo: 114557

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	213.4	5.0	0	0	0	0	0	1.351	197	30	R

Sample ID 050367-075A Batch ID: 3583 Test Name LEAD BY ICP

Units mg/Kg Analysis Date: 4/2/01 Prep Date: 4/2/01

DUP

SeqNo: 114570

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	5.617	5.0	0	0	0	0	0	7.029	22	30	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored. Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference
DO - Surrogate Diluted Out

Initials:



Advanced Technology Laboratories

Date: 06-Apr-01

CLIENT: Gecon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

QC SUMMARY REPORT
Sample Duplicate

Sample ID	049979-001ADU	Batch ID:	3382	Test Name	ICP METALS	Units mg/L	Analysis Date:	3/15/01	Prep Date:	3/13/01	
DUP						SeqNo:	109619				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	0.27	1.0	0	0	0	0	0	0.2	30	30	J
Nickel	3.053	1.0	0	0	0	0	0	3	2	30	

Sample ID	049829-048A	Batch ID:	3382	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/15/01	Prep Date:	3/13/01	
DUP						SeqNo:	109611				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	9.723	0.15	0	0	0	0	0	9.67	1	30	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored, Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:



Advanced Technology Laboratories

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Date: 06-Apr-01

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID	049775-080A	Batch ID:	3583	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	4/2/01	Prep Date:	4/2/01	
MS		SeqNo:	114558								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	218.6	5.0	250	1.351	87	47	128	0			

Sample ID	049775-080A	Batch ID:	3583	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	4/2/01	Prep Date:	4/2/01	
MSD		SeqNo:	114559								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	231.8	5.0	250	1.351	92	47	128	218.6	6	20	

Sample ID	050367-075A	Batch ID:	3583	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	4/2/01	Prep Date:	4/2/01	
MS		SeqNo:	114571								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	164.4	5.0	250	7.029	63	47	128	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored. Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:



Advanced Technology Laboratories

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Date: 06-Apr-01

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID	BLANK MS	Batch ID: 3382	Test Name	ICP METALS	Units mg/L	Analysis Date: 3/15/01	Prep Date: 3/13/01				
MS					SeqNo: 109397						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	2.42	0.10	2.5	0	97	68	118	0			
Nickel	2.5	0.10	2.5	0.00406	100	64	121	0			

Sample ID	BLANK MSD	Batch ID: 3382	Test Name	ICP METALS	Units mg/L	Analysis Date: 3/15/01	Prep Date: 3/13/01				
MSD					SeqNo: 109398						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	2.43	0.10	2.5	0	97	68	118	2.42	0	20	
Nickel	2.51	0.10	2.5	0.00406	100	64	121	2.5	0	20	

Sample ID	049829-048A	Batch ID: 3382	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date: 3/15/01	Prep Date: 3/13/01				
MS					SeqNo: 109612						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	13.91	0.15	5	9.67	85	80	120	0			

Sample ID	049829-048A	Batch ID: 3382	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date: 3/15/01	Prep Date: 3/13/01				
MSD					SeqNo: 109613						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	13.88	0.15	5	9.67	84	80	120	13.91	0	20	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank
 M - Not Monitored, Highly Reactive
 S - Spike/Surrogate outside of limits due to matrix interference
 DO - Surrogate Diluted Out
 Initials: JK



Advanced Technology Laboratories

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Date: 06-Apr-01

QC SUMMARY REPORT
Laboratory Control Spike - generic

Sample ID	LCS-3583	Batch ID:	3583	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	4/2/01	Prep Date:	4/2/01												
LCS						SeqNo:	114573															
Analyte	Lead	Result	209.3	PQL	5.0	SPK value	250	SPK Ref Val	0	%REC	84	LowLimit	80	HighLimit	120	RPD Ref Val	0	%RPD		RPDLimit		Qual

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
 M - Not Monitored. Highly Reactive
 S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials: 7



Advanced Technology Laboratories

Date: 06-Apr-01

QC SUMMARY REPORT
Laboratory Control Spike - generic

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Sample ID	LCS	Batch ID: 3382	Test Name ICP METALS				Units mg/L	Analysis Date: 3/15/01	Prep Date: 3/13/01		
LCS		SeqNo: 109395									
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	0.97	0.10	1	0	97	80	120	0			
Nickel	1	0.10	1	0.00406	100	80	120	0			

Sample ID	LCS-3382	Batch ID: 3382	Test Name LEAD BY ATOMIC ABSORPTION				Units mg/L	Analysis Date: 3/15/01	Prep Date: 3/13/01		
LCS		SeqNo: 109614									
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	9.38	0.15	10	0	94	80	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored. Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:

March 06, 2001

Ross White
Geocon Environmental
5673 W. Las Positas Blvd., Ste 205
Pleasanton, CA 94588
TEL: (925) 469-9750
FAX (925) 469-9749

ELAP No: 1838

RE: Union Valley Pkwy - E8000-06-58

Work Order No.: 049775

Attention: Ross White

Enclosed are the results for sample(s) received on February 28, 2001 by Advanced Technology Laboratories and tested for the parameters indicated in the enclosed chain of custody.

This is a preliminary report that contains incomplete data or data that has not been fully validated. Caution should be exercised in the use of any data presented as final reported results may not reflect the values presented.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,



Edgar Caballero
Laboratory Director

This cover letter is an integral part of this analytical report.



CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY:

Advanced Technology Laboratories
 1510 E. 33rd Street
 Signal Hill, CA 90807
 (562) 989-4045 • FAX (562) 989-4040

Client: Geneva
 Attn: R. WHITE
 Project Name: Union Valley Hwy
 Relinquished by: (Signature and Printed Name) [Signature] Date: 2/27/01
 Relinquished by: (Signature and Printed Name) [Signature] Date: 2/27/01
 Relinquished by: (Signature and Printed Name) [Signature] Date: 2/27/01

Method of Transport: Walk-in Courier UPS FED. EXP. ATL
 Sample Condition Upon Receipt: 1. CHILLED 4. SEALED Y N Y N
 2. HEADSPACE (VOA) 5. # OF SPLS MATCH COC Y N
 3. CONTAINER INTACT 6. PRESERVED Y N

P.O.#: _____ Date: _____ Time: _____
 Logged By: _____ Date: _____ Time: _____
 Address: 5673 W. Las Positas Bl. # 205 State: CA Zip Code: 94588
 City: San Francisco State: CA Zip: 94149

Project #: 02600-06-58 Sampler: D. WHITE
 Received by: (Signature and Printed Name) [Signature] Date: 2/27/01 Time: 10:00
 Received by: (Signature and Printed Name) [Signature] Date: 2/27/01 Time: 10:00
 Received by: (Signature and Printed Name) [Signature] Date: 2/27/01 Time: 10:00

Bill To: _____ Attn: _____ Co: _____ Address: _____ City: _____ State: _____ Zip: _____
 Circle or Add Analysis(es) Requested: _____

Special Instructions/Comments: LABS PLEASE ONLY SELECT 1070 FOR PH
1120 (SOLVENT) USE ONLY FOR 9045.
(S=Solvent)
(SIL) 17777-1110 (SOLVENT)
Do not (un)seal sample sets

Send Report To: _____ Attn: _____ Co: _____ Address: _____ City: _____ State: _____ Zip: _____
 Attn: SEE CLERK
 Co: _____ Address: _____ City: _____ State: _____ Zip: _____

LAB USE ONLY: Batch #: Lab No.	Sample Description	Date	Time	PRESERVATION		REMARKS
				Container(s)	Type	
49775-01/024	UV-1-1, 2, 3	1/4/01	1315	E	4	
005/028	UV-2-		1320			
009/012	UV-3-		1320			
013/016	UV-4-		1330			
017/020	UV-5-		1330			
021/024	UV-6H-		1400			
025/028	UV-6D-		1405			
029/032	UV-6C-		1410			
033/036	UV-6D-		1420			

Q A / Q C
 RTNE RWQCB WIP NAVY CT OTHER
 MATRIX: SOLID • SOIL • SLUDGE OIL • SOLVENT • LIQUID WATER • WASTEWATER DRINKING WATER AIR WIFE • FILTER OTHER

Matrix Legend:
 801 / 802 (Pesticides-CB-GC)
 825 / 827 (Volatiles-GCMS)
 8015M TPH/GBTEX (COMBINATION)
 8015M TPH/D (Diesel-GC)
 ICP/LEP (Lead)

TAT: A= Overnight ≤ 24 hr B= Emergency Next workday
 C= Critical 2 Workdays D= Urgent 3 Workdays E= Routine 7 Workdays
 Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal
 Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C Z=Zn(Ac)₂ O=NaOH T=Na₂S₂O₃

CHAIN OF CUSTODY RECORD

FOR LABORATORY USE ONLY:

Advanced Technology Laboratories
 1510 E. 33rd Street
 Signal Hill, CA 90807
 (562) 989-4045 • FAX (562) 989-4040

P.O.#: _____ Date: _____ Time: _____

Logged By: _____

Method of Transport
 Walk-in Courier UPS FED. EXP. ATL

Sample Condition Upon Receipt
 1. CHILLED Y N 4. SEALED Y N
 2. HEADSPACE (VOA) Y N 5. # OF SPLS MATCH COC Y N
 3. CONTAINER INTACT Y N 6. PRESERVED Y N

Client: Green Address: See pg 1 City: _____ State: _____ Zip Code: _____

Attn: R. WHITE TEL: _____ FAX: _____

Project Name: UNION VALLEY Project #: 270000658 Sampler: P. WATT (Signature) _____

Relinquished by: (Signature and Printed Name) _____ Date: 4/27/01 Time: 10:00

Relinquished by: (Signature and Printed Name) _____ Date: _____ Time: _____

Relinquished by: (Signature and Printed Name) _____ Date: _____ Time: _____

Special Instructions/Comments: See pg 1

Bill To: _____ Attn: _____

Co: _____ Address: _____ City: _____ State: _____ Zip: _____

LAB USE ONLY: Batch #:	Lab No.	Sample Description	Date	Time	CIRCLE APPROPRIATE MATRIX		PRESERVATION	REMARKS
					Container(s)	Type		
037/040	041/140	UV-17 - 12,13	4/26/01	1430	WATER • WASTEWATER	OTHER	4	N
041/044	042/141	UV-17 - 12	4/26/01	1430	WATER • WASTEWATER	OTHER	4	N
045/048	049/142	UV-17 - 12	4/26/01	1430	WATER • WASTEWATER	OTHER	4	N
048/052	053/143	UV-17 - 10	4/26/01	1445	WATER • WASTEWATER	OTHER	4	N
053/056	057/144	UV-17 - 11	4/26/01	1450	WATER • WASTEWATER	OTHER	4	N
057/060	061/145	UV-17 - 12	4/26/01	1451	WATER • WASTEWATER	OTHER	4	N
061/064	065/146	UV-17 - 13	4/26/01	1453	WATER • WASTEWATER	OTHER	4	N
065/068	069/147	UV-17 - 14	4/26/01	1457	WATER • WASTEWATER	OTHER	4	N
069/072	073/148	UV-17 - 15	4/26/01	1500	WATER • WASTEWATER	OTHER	4	N
073/076	077/149	UV-17 - 16	4/26/01	1500	WATER • WASTEWATER	OTHER	4	N

Circle or Add Analysis(es) Requested: 801 / 802 (pesticides/PCB-GC)
825 / 8270 (BNA-GCMS)
8015M TPH/GTEX (COMBINATION)
8015M TPHD (Diesel-GC)
WATER / WASTEWATER

Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C
 Z=Zn(AC)₂ O=NaOH T=Na₂S₂O₃

Container Types: T=Tube V=VOA L=Liter P=Pin L=Jar B=Tedlar G=Glass P=Plastic M=Metal

TAT: A= Overnight ≤ 24 hr B= Emergency Next workday C= Critical 2 Workdays D= Urgent 3 Workdays E= Routine 7 Workdays

* \$10.00 FEE PER HAZARDOUS SAMPLE DISPOSAL.

Advanced Technology Laboratories

Print Date: 06-Mar-01

CLIENT: Geocon Environmental
Lab Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Test No: EPA 6010B
Units: mg/Kg
Analyst: RQ

Sample ID	Client Sample ID	Matrix	Collection Date	QC Batch	Lead	PQL	Qual	DF	Analysis Date
049775-001A	UV-1-S	Soil	2/26/01	3110	62	5	1		3/2/01
049775-002A	UV-1-1	Soil	2/26/01	3110	7.2	5	1		3/2/01
049775-003A	UV-1-2	Soil	2/26/01	3110	ND	5	1		3/2/01
049775-004A	UV-1-3	Soil	2/26/01	3110	ND	5	1		3/2/01
049775-005A	UV-2-S	Soil	2/26/01	3113	34	5	1		3/2/01
049775-006A	UV-2-1	Soil	2/26/01	3113	24	5	1		3/2/01
049775-007A	UV-2-2	Soil	2/26/01	3113	6.9	5	1		3/2/01
049775-008A	UV-2-3	Soil	2/26/01	3113	ND	5	1		3/2/01
049775-009A	UV-3-S	Soil	2/26/01	3113	41	5	1		3/2/01
049775-010A	UV-3-1	Soil	2/26/01	3113	36	5	1		3/2/01
049775-011A	UV-3-2	Soil	2/26/01	3113	11	5	1		3/2/01
049775-012A	UV-3-3	Soil	2/26/01	3113	ND	5	1		3/2/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
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 DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 



Advanced Technology Laboratories

Print Date: 06-Mar-01

CLIENT: Geocon Environmental
 Lab Order: 049775
 Project: Union Valley Pkwy - E8000-06-58

Test No: EPA 6010B
 Units: mg/Kg
 Analyst: RQ

Sample ID	Client Sample ID	Matrix	Collection Date	QC Batch	Lead	PQL	Qual	DF	Analysis Date
049775-013A	UV-4-S	Soil	2/26/01	3113	44	5	1		3/2/01
049775-014A	UV-4-1	Soil	2/26/01	3113	19	5	1		3/2/01
049775-015A	UV-4-2	Soil	2/26/01	3114	11	5	1		3/2/01
049775-016A	UV-4-3	Soil	2/26/01	3114	ND	5	1		3/2/01
049775-017A	UV-5-S	Soil	2/26/01	3114	46	5	1		3/2/01
049775-018A	UV-5-1	Soil	2/26/01	3114	ND	5	1		3/2/01
049775-019A	UV-5-2	Soil	2/26/01	3114	ND	5	1		3/2/01
049775-020A	UV-5-3	Soil	2/26/01	3114	ND	5	1		3/2/01
049775-021A	UV-6A-S	Soil	2/26/01	3114	51	5	1		3/2/01
049775-022A	UV-6A-1	Soil	2/26/01	3114	ND	5	1		3/2/01
049775-023A	UV-6A-2	Soil	2/26/01	3114	ND	5	1		3/2/01
049775-024A	UV-6A-3	Soil	2/26/01	3114	ND	5	1		3/2/01

Qualifiers: ND - Not Detected at the Reporting Limit
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 DO - Surrogate Diluted Out

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 H - Samples exceeding analytical holding time
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Initials: 



Advanced Technology Laboratories

Print Date: 06-Mar-01

CLIENT: Geocon Environmental
 Lab Order: 049775
 Project: Union Valley Pkwy - E8000-06-58

Test No: EPA 6010B
 Units: mg/Kg
 Analyst: RQ

Sample ID	Client Sample ID	Matrix	Collection Date	QC Batch	Lead	PQL	Qual	DF	Analysis Date
049775-025A	UV-6B-S	Soil	2/26/01	3115	39	5	1		3/2/01
049775-026A	UV-6B-1	Soil	2/26/01	3115	31	5	1		3/2/01
049775-027A	UV-6B-2	Soil	2/26/01	3115	7.1	5	1		3/2/01
049775-028A	UV-6B-3	Soil	2/26/01	3115	ND	5	1		3/2/01
049775-029A	UV-6C-S	Soil	2/26/01	3115	48	5	1		3/2/01
049775-030A	UV-6C-1	Soil	2/26/01	3115	15	5	1		3/2/01
049775-031A	UV-6C-2	Soil	2/26/01	3115	ND	5	1		3/2/01
049775-032A	UV-6C-3	Soil	2/26/01	3115	ND	5	1		3/2/01
049775-033A	UV-6D-S	Soil	2/26/01	3115	12	5	1		3/2/01
049775-034A	UV-6D-1	Soil	2/26/01	3115	ND	5	1		3/2/01
049775-035A	UV-6D-2	Soil	2/26/01	3116	ND	5	1		3/3/01
049775-036A	UV-6D-3	Soil	2/26/01	3116	ND	5	1		3/3/01

Qualifiers: ND - Not Detected at the Reporting Limit
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 M - Not Monitored. Highly Reactive

Initials: 



Advanced Technology Laboratories

Print Date: 06-Mar-01

CLIENT: Geocon Environmental
Lab Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Test No: EPA 6010B
Units: mg/Kg
Analyst: RQ

Sample ID	Client Sample ID	Matrix	Collection Date	QC Batch	Lead	PQL	Qual	DF	Analysis Date
049775-037A	UV-7-S	Soil	2/26/01	3116	17	5	1		3/3/01
049775-038A	UV-7-1	Soil	2/26/01	3116	ND	5	1		3/3/01
049775-039A	UV-7-2	Soil	2/26/01	3116	ND	5	1		3/3/01
049775-040A	UV-7-3	Soil	2/26/01	3116	ND	5	1		3/3/01
049775-041A	UV-8-S	Soil	2/26/01	3116	25	5	1		3/3/01
049775-042A	UV-8-1	Soil	2/26/01	3116	9.2	5	1		3/3/01
049775-043A	UV-8-2	Soil	2/26/01	3116	ND	5	1		3/3/01
049775-044A	UV-8-3	Soil	2/26/01	3116	ND	5	1		3/3/01
049775-045A	UV-9-S	Soil	2/26/01	3117	11	5	1		3/3/01
049775-046A	UV-9-1	Soil	2/26/01	3117	42	5	1		3/3/01
049775-047A	UV-9-2	Soil	2/26/01	3117	ND	5	1		3/3/01
049775-048A	UV-9-3	Soil	2/26/01	3117	ND	5	1		3/3/01

Qualifiers: ND - Not Detected at the Reporting Limit
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 E - Value above quantitation range
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Initials: 



Advanced Technology Laboratories

Print Date: 06-Mar-01

Client: Geocon Environmental
Lab Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Test No: EPA 6010B
Units: mg/Kg
Analyst: RQ

Sample ID	Client Sample ID	Matrix	Collection Date	QC Batch	Lead	PQL	Qual	DF	Analysis Date
049775-049A	UV-10-S	Soil	2/26/01	3117	6.5	5	1		3/3/01
049775-050A	UV-10-1	Soil	2/26/01	3117	190	5	1		3/3/01
049775-051A	UV-10-2	Soil	2/26/01	3117	5.2	5	1		3/3/01
049775-052A	UV-10-3	Soil	2/26/01	3117	ND	5	1		3/3/01
049775-053A	UV-11-S	Soil	2/26/01	3117	19	5	1		3/3/01
049775-054A	UV-11-1	Soil	2/26/01	3117	30	5	1		3/3/01
049775-055A	UV-11-2	Soil	2/26/01	3118	170	5	1		3/3/01
049775-056A	UV-11-3	Soil	2/26/01	3118	110	5	1		3/3/01
049775-057A	UV-12-S	Soil	2/26/01	3118	11	5	1		3/3/01
049775-058A	UV-12-1	Soil	2/26/01	3118	45	5	1		3/3/01
049775-059A	UV-12-2	Soil	2/26/01	3118	ND	5	1		3/3/01
049775-060A	UV-12-3	Soil	2/26/01	3118	ND	5	1		3/3/01

Qualifiers: ND - Not Detected at the Reporting Limit
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 DO - Surrogate Diluted Out

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 H - Samples exceeding analytical holding time
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Initials: 



Advanced Technology Laboratories

Print Date: 06-Mar-01

CLIENT: Geocon Environmental
 Lab Order: 049775
 Project: Union Valley Pkwy - E8000-06-58

Test No: EPA 6010B
 Units: mg/Kg
 Analyst: RQ

Sample ID	Client Sample ID	Matrix	Collection Date	QC Batch	Lead	PQL	Qual	DF	Analysis Date
049775-061A	UV-13-S	Soil	2/26/01	3118	30	5	1		3/3/01
049775-062A	UV-13-1	Soil	2/26/01	3118	14	5	1		3/3/01
049775-063A	UV-13-2	Soil	2/26/01	3118	ND	5	1		3/3/01
049775-064A	UV-13-3	Soil	2/26/01	3118	ND	5	1		3/3/01
049775-065A	UV-14-S	Soil	2/26/01	3119	25	5	1		3/3/01
049775-066A	UV-14-1	Soil	2/26/01	3119	310	5	1		3/3/01
049775-067A	UV-14-2	Soil	2/26/01	3119	12	5	1		3/3/01
049775-068A	UV-14-3	Soil	2/26/01	3119	ND	5	1		3/3/01
049775-069A	UV-15-S	Soil	2/26/01	3119	ND	5	1		3/3/01
049775-070A	UV-15-1	Soil	2/26/01	3119	130	5	1		3/3/01
049775-071A	UV-15-2	Soil	2/26/01	3119	92	5	1		3/3/01
049775-072A	UV-15-3	Soil	2/26/01	3119	42	5	1		3/3/01

Qualifiers: ND - Not Detected at the Reporting Limit
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Initials: 



Advanced Technology Laboratories

Print Date: 06-Mar-01

CLIENT: Geocon Environmental
 Lab Order: 049775
 Project: Union Valley Pkwy - E8000-06-58

Test No: EPA 6010B
 Units: mg/Kg
 Analyst: RQ

Sample ID	Client Sample ID	Matrix	Collection Date	QC Batch	Lead	PQL	Qual	DF	Analysis Date
49775-073A	UV-16-S	Soil	2/26/01	3119	83	5	1		3/3/01
49775-074A	UV-16-1	Soil	2/26/01	3119	110	5	1		3/3/01
49775-075A	UV-16-2	Soil	2/26/01	3120	26	5	1		3/3/01
49775-076A	UV-16-3	Soil	2/26/01	3120	130	5	1		3/3/01
49775-077A	UV-17-S	Soil	2/26/01	3120	38	5	1		3/3/01
049775-078A	UV-17-1	Soil	2/26/01	3120	100	5	1		3/3/01
049775-079A	UV-17-2	Soil	2/26/01	3120	120	5	1		3/3/01
049775-080A	UV-17-3	Soil	2/26/01	3120	110	5	1		3/3/01

Qualifiers: ND - Not Detected at the Reporting Limit
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 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 



Advanced Technology Laboratories

Print Date: 06-Mar-01

CLIENT: Geocon Environmental
 Lab Order: 049775
 Project: Union Valley Pkwy - E8000-06-58

Test No: EPA 9045C
 Units: pH Units
 Analyst: CA

Sample ID	Client Sample ID	Matrix	Collection Date	QC Batch	pH	PQL	Qual	DF	Analysis Date
049775-003A	UV-1-2	Soil	2/26/01	R6687	7.92	0.1	1		3/5/01
049775-013A	UV-4-S	Soil	2/26/01	R6687	8.80	0.1	1		3/5/01
049775-023A	UV-6A-2	Soil	2/26/01	R6687	5.78	0.1	1		3/5/01
049775-035A	UV-6D-2	Soil	2/26/01	R6716	5.59	0.1	1		3/6/01
049775-043A	UV-8-2	Soil	2/26/01	R6687	5.52	0.1	1		3/5/01
049775-053A	UV-11-S	Soil	2/26/01	R6688	8.96	0.1	1		3/5/01
049775-063A	UV-13-2	Soil	2/26/01	R6688	6.85	0.1	1		3/5/01
049775-073A	UV-16-S	Soil	2/26/01	R6688	7.27	0.1	1		3/5/01

Qualifiers: ND - Not Detected at the Reporting Limit
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 DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 

Advanced Technology
 Laboratories

1510 E. 33rd Street Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040



Advanced Technology Laboratories

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Date: 06-Mar-01

QC SUMMARY REPORT
Method Blank

Sample ID	Batch ID	Test Name	Units mg/Kg	Analysis Date	Prep Date
MB-3110	3110	LEAD BY ICP		3/2/01	3/1/01
MBLK			SeqNo: 103639		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC
Lead	ND	5.0			
			LowLimit	HighLimit	RPD Ref Val
					%RPD
					RPDLimit
					Qual

Sample ID	Batch ID	Test Name	Units mg/Kg	Analysis Date	Prep Date
MB-3113	3113	LEAD BY ICP		3/2/01	3/2/01
MBLK			SeqNo: 103652		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC
Lead	ND	5.0			
			LowLimit	HighLimit	RPD Ref Val
					%RPD
					RPDLimit
					Qual

Sample ID	Batch ID	Test Name	Units mg/Kg	Analysis Date	Prep Date
MB-3114	3114	LEAD BY ICP		3/2/01	3/2/01
MBLK			SeqNo: 103666		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC
Lead	ND	5.0			
			LowLimit	HighLimit	RPD Ref Val
					%RPD
					RPDLimit
					Qual

Sample ID	Batch ID	Test Name	Units mg/Kg	Analysis Date	Prep Date
MB-3115	3115	LEAD BY ICP		3/2/01	3/2/01
MBLK			SeqNo: 103679		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC
Lead	ND	5.0			
			LowLimit	HighLimit	RPD Ref Val
					%RPD
					RPDLimit
					Qual

Sample ID	Batch ID	Test Name	Units mg/Kg	Analysis Date	Prep Date
MB-3116	3116	LEAD BY ICP		3/3/01	3/2/01
MBLK			SeqNo: 103965		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC
Lead	ND	5.0			
			LowLimit	HighLimit	RPD Ref Val
					%RPD
					RPDLimit
					Qual

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank
 M - Not Monitored. Highly Reactive
 S - Spike/Surrogate outside of limits due to matrix interference
 DO - Surrogate Diluted Out
 Initials: *[Signature]*



QC SUMMARY REPORT

Method Blank

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Sample ID **MB-3117** Batch ID: **3117** Test Name **LEAD BY ICP** Units mg/Kg Analysis Date: **3/3/01** Prep Date: **3/2/01**
MBLK SeqNo: **104014**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	5.0									J

Sample ID **MB-3118** Batch ID: **3118** Test Name **LEAD BY ICP** Units mg/Kg Analysis Date: **3/3/01** Prep Date: **3/2/01**
MBLK SeqNo: **104052**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	5.0									J

Sample ID **MB-3119** Batch ID: **3119** Test Name **LEAD BY ICP** Units mg/Kg Analysis Date: **3/3/01** Prep Date: **3/2/01**
MBLK SeqNo: **104067**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	5.0									J

Sample ID **MB-3120** Batch ID: **3120** Test Name **LEAD BY ICP** Units mg/Kg Analysis Date: **3/3/01** Prep Date: **3/2/01**
MBLK SeqNo: **104097**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	5.0									J

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
 M - Not Monitored, Highly Reactive
 S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:



Advanced Technology Laboratories

Date: 06-Mar-01

QC SUMMARY REPORT

Sample Duplicate

CLIENT: Gecon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Sample ID	049774-046A	Batch ID:	3110	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/2/01	Prep Date:	3/1/01	
DUP		SeqNo:	103631								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	5.588	5.0	0	0	0	0	0	3.665	42	30	R

Sample ID	049775-014A	Batch ID:	3113	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/2/01	Prep Date:	3/2/01	
DUP		SeqNo:	103649								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	18.16	5.0	0	0	0	0	0	18.55	2	30	

Sample ID	049775-024A	Batch ID:	3114	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/2/01	Prep Date:	3/2/01	
DUP		SeqNo:	103662								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.323	5.0	0	0	0	0	0	0.384	17	30	J

Sample ID	049775-034A	Batch ID:	3115	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/2/01	Prep Date:	3/2/01	
DUP		SeqNo:	103676								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	2.91	5.0	0	0	0	0	0	3.14	8	30	J

Sample ID	049775-044A	Batch ID:	3116	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/3/01	Prep Date:	3/2/01	
DUP		SeqNo:	103959								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.79	5.0	0	0	0	0	0	0.625	23	30	J

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank
 M - Not Monitored, Highly Reactive
 S - Spike/Surrogate outside of limits due to matrix interference
 DO - Surrogate Diluted Out

Initials:  3



QC SUMMARY REPORT

Sample Duplicate

CLIENT: Geokon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Sample ID 049775-054A **Batch ID:** 3117 **Test Name** LEAD BY ICP **Units mg/Kg** Analysis Date: 3/3/01 **Prep Date:** 3/2/01
DUP **SeqNo:** 104011

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	45.5	5.0	0	0	0	0	0	29.57	42	30	R

Sample ID 049775-064A **Batch ID:** 3118 **Test Name** LEAD BY ICP **Units mg/Kg** Analysis Date: 3/3/01 **Prep Date:** 3/2/01
DUP **SeqNo:** 104048

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	1.07	5.0	0	0	0	0	0	1.21	12	30	J

Sample ID 049775-074A **Batch ID:** 3119 **Test Name** LEAD BY ICP **Units mg/Kg** Analysis Date: 3/3/01 **Prep Date:** 3/2/01
DUP **SeqNo:** 104064

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	96.52	5.0	0	0	0	0	0	105.4	9	30	

Sample ID 049807-004A **Batch ID:** 3120 **Test Name** LEAD BY ICP **Units mg/Kg** Analysis Date: 3/3/01 **Prep Date:** 3/2/01
DUP **SeqNo:** 104092

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	35.17	5.0	0	0	0	0	0	6.717	136	30	R

Sample ID 049775-043a **Batch ID:** R6687 **Test Name** pH **Units pH** Analysis Date: 3/5/01 **Prep Date:** 3/5/01
DUP **SeqNo:** 104516

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	5.49	0.10	0	0	0	0	0	5.52	1	20	

Qualifiers: NID - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank
M - Not Monitored. Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference
Initials:  **DO - Surrogate Diluted Out**



QC SUMMARY REPORT

Sample Duplicate

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Sample ID 049807-064a **Batch ID:** R6688 **Units pH Uni Analysis Date:** 3/5/01 **Prep Date:** 3/5/01
DUP **SeqNo:** 104527

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	8.49	0.10	0	0	0	0	0	8.54	1	20	

Sample ID 049828-082a **Batch ID:** R6716 **Units pH Uni Analysis Date:** 3/6/01 **Prep Date:** 3/6/01
DUP **SeqNo:** 105043

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	7.91	0.10	0	0	0	0	0	7.21	9	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored, Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:



Advanced Technology Laboratories

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Date: 08-Mar-01

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID	049774-046A	Batch ID:	3110	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/2/01	Prep Date:	3/1/01	
MS		SeqNo:	103632								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	162.4	5.0	250	3.665	63	47	128	0			

Sample ID	049775-014A	Batch ID:	3113	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/2/01	Prep Date:	3/2/01	
MS		SeqNo:	103650								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	154.4	5.0	250	18.55	54	47	128	0			

Sample ID	049775-024A	Batch ID:	3114	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/2/01	Prep Date:	3/2/01	
MS		SeqNo:	103663								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	175.8	5.0	250	0.384	70	47	128	0			

Sample ID	049775-034A	Batch ID:	3115	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/2/01	Prep Date:	3/2/01	
MS		SeqNo:	103677								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	162.4	5.0	250	3.14	64	47	128	0			

Sample ID	049775-044A	Batch ID:	3116	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/3/01	Prep Date:	3/2/01	
MS		SeqNo:	103960								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	239.3	5.0	250	0.625	95	47	128	0			

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank
 M - Not Monitored. Highly Reactive
 S - Spike/Surrogate outside of limits due to matrix interference
 DO - Surrogate Diluted Out
 Initials: 6



QC SUMMARY REPORT

Sample Matrix Spike

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Sample ID	049775-054A	Batch ID:	3117	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/3/01	Prep Date:	3/2/01	
MS		SeqNo:	104012								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	212.1	5.0	250	29.57	73	47	128	0			

Sample ID	049775-064A	Batch ID:	3118	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/3/01	Prep Date:	3/2/01	
MS		SeqNo:	104049								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	170.6	5.0	250	1.21	68	47	128	0			

Sample ID	049775-074A	Batch ID:	3119	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/3/01	Prep Date:	3/2/01	
MS		SeqNo:	104065								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	283.7	5.0	250	105.4	71	47	128	0			

Sample ID	049807-004A	Batch ID:	3120	Test Name	LEAD BY ICP	Units mg/Kg	Analysis Date:	3/3/01	Prep Date:	3/2/01	
MS		SeqNo:	104093								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	234.8	5.0	250	6.717	91	47	128	0			

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank
 M - Not Monitored, Highly Reactive
 S - Spike/Surrogate outside of limits due to matrix interference
 DO - Surrogate Diluted Out
Initials:



Advanced Technology Laboratories

CLIENT: Gecon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Date: 08-Mar-01

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID LCS-3116 Batch ID: 3116 Test Name LEAD BY ICP Units mg/Kg Analysis Date: 3/3/01 Prep Date: 3/2/01

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	257	5.0	250	0.1295	103	80	120	0			

SeqNo: 103963

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored. Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:

Advanced Technology Laboratories

Print Date: 15-Mar-01

CLIENT: Geocon Environmental
 Lab Order: 049775
 Project: Union Valley Pkwy - E8000-06-58

Test No: WET/ EPA 7420
 Units: mg/L
 Analyst: NS

Sample ID	Client Sample ID	Matrix	Collection Date	QC Batch	Lead	PQL	Qual	DF	Analysis Date
049775-001A	UV-1-S	Soil	2/26/01	3332	5.9	0.15	1		3/12/01
049775-021A	UV-6A-S	Soil	2/26/01	3332	7.3	0.15	1		3/12/01
049775-050A	UV-10-1	Soil	2/26/01	3332	24	0.3	2		3/12/01
049775-055A	UV-11-2	Soil	2/26/01	3332	24	0.3	2		3/12/01
049775-056A	UV-11-3	Soil	2/26/01	3332	10	0.15	1		3/12/01
049775-066A	UV-14-1	Soil	2/26/01	3382	27	0.3	2		3/15/01
049775-070A	UV-15-1	Soil	2/26/01	3332	15	0.15	1		3/12/01
049775-071A	UV-15-2	Soil	2/26/01	3333	11	0.15	1		3/12/01
049775-073A	UV-16-S	Soil	2/26/01	3333	5.6	0.15	1		3/12/01
049775-074A	UV-16-1	Soil	2/26/01	3333	18	0.3	2		3/12/01
049775-076A	UV-16-3	Soil	2/26/01	3333	17	0.3	2		3/12/01
049775-078A	UV-17-1	Soil	2/26/01	3333	20	0.3	2		3/12/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 

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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Print Date: 15-Mar-01

CLIENT: Geocon Environmental
Lab Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Test No: WET/ EPA 7420
Units: mg/L
Analyst: NS

Sample ID	Client Sample ID	Matrix	Collection Date	QC Batch	Lead	PQL	Qual	DF	Analysis Date
049775-079A	UV-17-2	Soil	2/26/01	3333	14	0.15	1		3/12/01
049775-080A	UV-17-3	Soil	2/26/01	3333	0.62	0.15	1		3/12/01

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
H - Samples exceeding analytical holding time
E - Value above quantitation range
M - Not Monitored. Highly Reactive

Initials: 





Advanced Technology Laboratories

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Date: 15-Mar-01

QC SUMMARY REPORT

Method Blank

Sample ID	MB-3332	Batch ID	3332	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date	3/12/01	Prep Date	3/12/01	
MBLK						SeqNo:	107635				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.15									

Sample ID	MB-3333	Batch ID	3333	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date	3/12/01	Prep Date	3/12/01	
MBLK						SeqNo:	107649				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.15									J

Sample ID	MB-3382	Batch ID	3382	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date	3/15/01	Prep Date	3/13/01	
MBLK						SeqNo:	109600				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.15									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored. Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:



Advanced Technology Laboratories

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Date: 15-Mar-01

QC SUMMARY REPORT

Sample Duplicate

Sample ID	049775-070A	Batch ID:	3332	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/12/01	Prep Date:	3/12/01	
DUP		SeqNo:	107645								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	14.69	0.15	0	0	0	0	0	14.66	0	30	

Sample ID	049775-080A	Batch ID:	3333	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/12/01	Prep Date:	3/12/01	
DUP		SeqNo:	107657								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.588	0.15	0	0	0	0	0	0.6186	5	30	

Sample ID	049829-048A	Batch ID:	3382	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/15/01	Prep Date:	3/13/01	
DUP		SeqNo:	109611								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	9.723	0.15	0	0	0	0	0	9.67	1	30	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored, Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:



Advanced Technology Laboratories

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Date: 15-Mar-01

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID	049775-070A	Batch ID:	3332	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/12/01	Prep Date:	3/12/01	
MS		SeqNo:	107646								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	25.79	0.30	10	14.66	111	80	120	0			

Sample ID	049775-070A	Batch ID:	3332	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/12/01	Prep Date:	3/12/01	
MSD		SeqNo:	107647								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	25.97	0.30	10	14.66	113	80	120	25.79	1	20	

Sample ID	049775-080A	Batch ID:	3333	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/12/01	Prep Date:	3/12/01	
MS		SeqNo:	107658								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	5.74	0.15	5	0.6186	102	80	120	0			

Sample ID	049775-080A	Batch ID:	3333	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/12/01	Prep Date:	3/12/01	
MSD		SeqNo:	107659								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	5.802	0.15	5	0.6186	104	80	120	5.74	1	20	

Sample ID	049829-048A	Batch ID:	3382	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/15/01	Prep Date:	3/13/01	
MS		SeqNo:	109612								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	13.91	0.15	5	9.67	85	80	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored. Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:



QC SUMMARY REPORT

Sample Matrix Spike Duplicate

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Sample ID 049829-048A Batch ID: 3382 Test Name LEAD BY ATOMIC ABSORPTION Units mg/L Analysis Date: 3/15/01 Prep Date: 3/13/01

MSD	SeqNo:	109613	Units mg/L	Analysis Date:	3/15/01	Prep Date:	3/13/01					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Limit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	13.88	0.15	5	9.67	84	80	120	0	13.91	0	20	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
 M - Not Monitored. Highly Reactive
 S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:

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CLIENT: Geocon Environmental
 Work Order: 049775
 Project: Union Valley Pkwy - E8000-06-58

Date: 15-Mar-01

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID	LCS-3332	Batch ID: 3332	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date: 3/12/01	Prep Date: 3/12/01				
		SeqNo: 107648									
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	10.47	0.15	10	0	105	80	120	0			

Sample ID	LCS-3333	Batch ID: 3333	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date: 3/12/01	Prep Date: 3/12/01				
		SeqNo: 107660									
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	10.64	0.15	10	0.1205	105	80	120	0			

Sample ID	LCS-3382	Batch ID: 3382	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date: 3/15/01	Prep Date: 3/13/01				
		SeqNo: 109614									
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	9.38	0.15	10	0	94	80	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
 M - Not Monitored. Highly Reactive
 S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:

Advanced Technology Laboratories

Print Date: 20-Mar-01

CLIENT: Geocon Environmental
 Lab Order: 049775
 Project: Union Valley Pkwy - E8000-06-58

Test No: WET DI/ EPA 7420
 Units: mg/L
 Analyst: NS

Sample ID	Client Sample ID	Matrix	Collection Date	QC Batch	Lead	PQL	Qual	DF	Analysis Date
049775-001A	UV-1-S	Soil	2/26/01	3418	ND	0.15	1		3/19/01
049775-021A	UV-6A-S	Soil	2/26/01	3418	ND	0.15	1		3/19/01
049775-050A	UV-10-1	Soil	2/26/01	3418	1.3	0.15	1		3/19/01
049775-055A	UV-11-2	Soil	2/26/01	3418	0.72	0.15	1		3/19/01
049775-056A	UV-11-3	Soil	2/26/01	3418	ND	0.15	1		3/19/01
049775-066A	UV-14-1	Soil	2/26/01	3418	2.6	0.15	1		3/19/01
049775-070A	UV-15-1	Soil	2/26/01	3418	1.0	0.15	1		3/19/01
049775-071A	UV-15-2	Soil	2/26/01	3418	ND	0.15	1		3/19/01
049775-073A	UV-16-S	Soil	2/26/01	3418	ND	0.15	1		3/19/01
049775-074A	UV-16-1	Soil	2/26/01	3418	1.5	0.15	1		3/19/01
049775-076A	UV-16-3	Soil	2/26/01	3419	ND	0.15	1		3/19/01
049775-078A	UV-17-1	Soil	2/26/01	3419	0.42	0.15	1		3/19/01

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
 H - Samples exceeding analytical holding time
 E - Value above quantitation range
 M - Not Monitored. Highly Reactive

Initials: 



Advanced Technology Laboratories

Print Date: 20-Mar-01

CLIENT: Geocon Environmental
Lab Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Test No: WET DI/ EPA 7420
Units: mg/L
Analyst: NS

Sample ID	Client Sample ID	Matrix	Collection Date	QC Batch	Lead	PQL	Qual	DF	Analysis Date
049775-079A	UV-17-2	Soil	2/26/01	3419	ND	0.15	1		3/19/01

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference.
H - Samples exceeding analytical holding time
E - Value above quantitation range
M - Not Monitored. Highly Reactive

Initials: 





Advanced Technology Laboratories

Date: 20-Mar-01

QC SUMMARY REPORT
Method Blank

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Sample ID	MB-3418	Batch ID:	3418	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/19/01	Prep Date:	3/16/01			
MBLK						SeqNo:	110190						
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead		ND		0.15									

Sample ID	MB-3419	Batch ID:	3419	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/19/01	Prep Date:	3/16/01			
MBLK						SeqNo:	110205						
Analyte		Result		PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead		ND		0.15									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored, Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:



Advanced Technology Laboratories

Date: 20-Mar-01

QC SUMMARY REPORT
Sample Duplicate

CLIENT: Gecon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Sample ID 049775-074A Batch ID: 3418 Test Name LEAD BY ATOMIC ABSORPTION Units mg/L Analysis Date: 3/19/01 Prep Date: 3/16/01
SeqNo: 110201

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.15	0	0	0	0	0	1.536	0	30	

Sample ID 049775-079A Batch ID: 3419 Test Name LEAD BY ATOMIC ABSORPTION Units mg/L Analysis Date: 3/19/01 Prep Date: 3/16/01
SeqNo: 110209

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	1.93	0.15	0	0	0	0	0	0	200	30	R

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored. Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials: RB 2



Advanced Technology Laboratories

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Date: 20-Mar-01

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID	049775-074A	Batch ID:	3418	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/19/01	Prep Date:	3/16/01	
		SeqNo:	110202								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	6.86	0.15	5	1.536	106	80	120	0			

Sample ID	049775-074A	Batch ID:	3418	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/19/01	Prep Date:	3/16/01	
		SeqNo:	110203								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	6.797	0.15	5	1.536	105	80	120	6.86	1	20	

Sample ID	049775-079A	Batch ID:	3419	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/19/01	Prep Date:	3/16/01	
		SeqNo:	110210								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	4.794	0.15	5	0	96	80	120	0			

Sample ID	049775-079A	Batch ID:	3419	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/19/01	Prep Date:	3/16/01	
		SeqNo:	110211								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	4.845	0.15	5	0	97	80	120	4.794	1	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored. Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:



Advanced Technology Laboratories

Date: 20-Mar-01

QC SUMMARY REPORT
Laboratory Control Spike - generic

CLIENT: Geocon Environmental
Work Order: 049775
Project: Union Valley Pkwy - E8000-06-58

Sample ID	LCS-3418	Batch ID:	3418	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/19/01	Prep Date:	3/16/01										
						SeqNo:	110204													
Analyte	Lead	Result	9.628	PQL	0.15	SPK value	10	SPK Ref Val	0	%REC	96	LowLimit	80	HighLimit	120	RPD Ref Val	0	%RPD	RPDLimit	Qual

Sample ID	LCS-3419	Batch ID:	3419	Test Name	LEAD BY ATOMIC ABSORPTION	Units mg/L	Analysis Date:	3/19/01	Prep Date:	3/16/01										
						SeqNo:	110212													
Analyte	Lead	Result	9.894	PQL	0.15	SPK value	10	SPK Ref Val	0	%REC	99	LowLimit	80	HighLimit	120	RPD Ref Val	0	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank
M - Not Monitored. Highly Reactive
S - Spike/Surrogate outside of limits due to matrix interference

DO - Surrogate Diluted Out

Initials:

UNION VALLEY PKWY

EB000-06-58

Laboratory Analyses

The following laboratory analyses will be performed on a normal turn-around-time.

- All soil samples will be analyzed for total lead following Environmental Protection Agency (EPA) Test Method 6010;
- Ten percent of the soil samples, chosen at random, will be analyzed for soil pH following EPA Test Method 9045;
- Soil samples that exhibit total lead concentrations greater than 50 and less than 1000 mg/kg will be analyzed for soluble lead via the WET;
- Soil samples that exhibit soluble lead (WET) concentrations greater than 5.0 mg/l will be re-analyzed for soluble lead via the WET using deionized water as the extractant (WET-DI);
- Soil samples that exhibit total lead concentrations greater than 999 mg/kg will be analyzed for soluble lead via the WET.

APPENDIX

B

Project Name: UVPW
Project Number: E8000-06-58
Task Order Number: 05-314200-GT

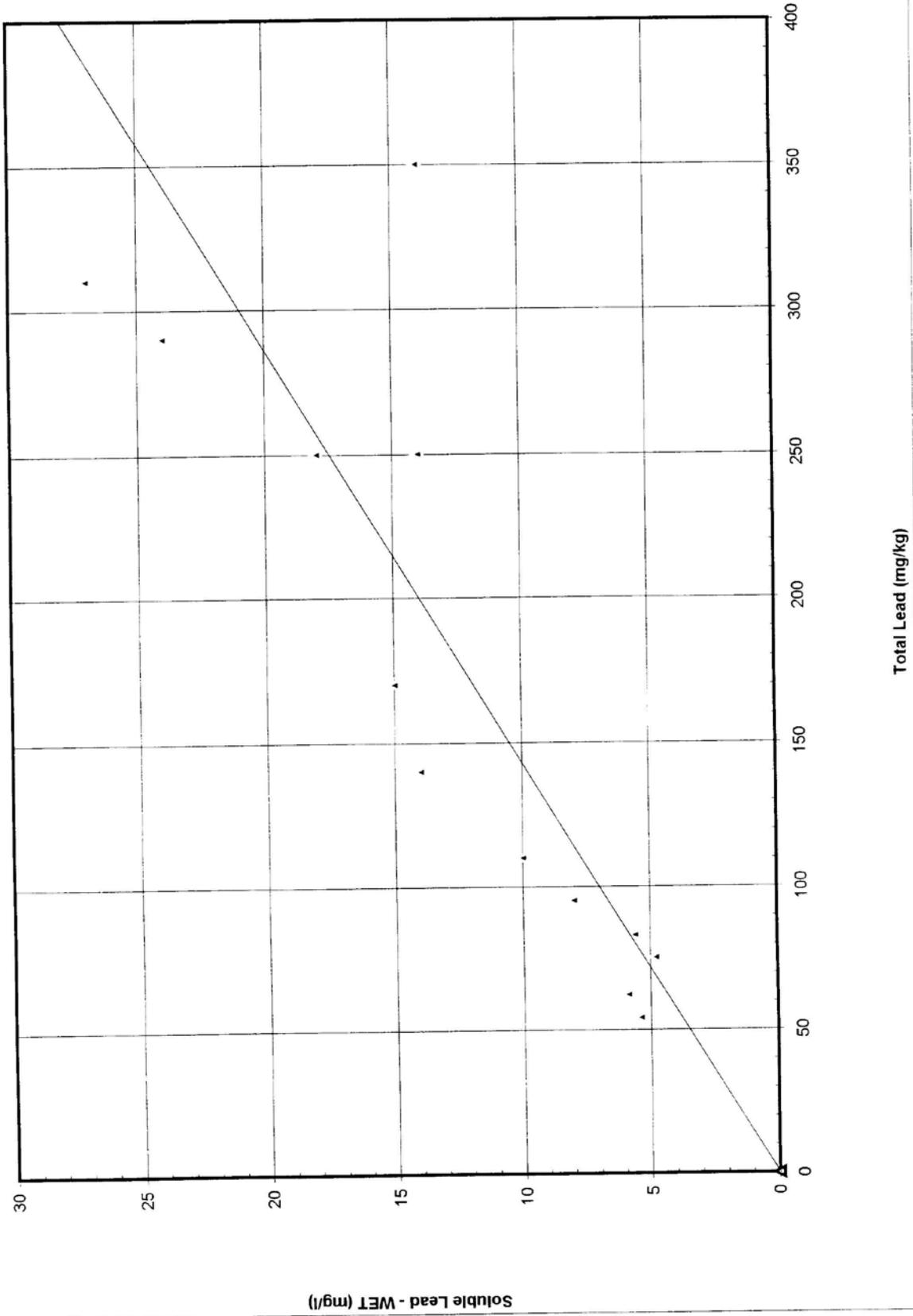
Regression Analysis Results for Total Lead vs. Soluble Lead (WET)

Regression Output:

Constant (<i>b</i>)	0
Slope (<i>m</i>)	0.0698
Correlation (<i>r</i>)	0.8
Number of (<i>x</i>, <i>y</i>) Observations	13
Total Lead Mean	172
Total Lead Standard Error	29
Total Lead Standard Deviation	104
Soluble Lead (WET) Mean	13
Soluble Lead (WET) Standard Error	2.0
Soluble Lead (WET) Standard Deviation	7

Regression Line: $y = m(x) + b$, where x = total lead and y = soluble lead (WET)

UVPW - Total Lead vs. Soluble Lead (WET)



UVPW Stats (ALL)											
Sample	x (mg/kg)	asin(x/83)	Sample	x (mg/kg)	asin(x/310)	Sample	x (mg/kg)	asin(x/250)	Sample	x (mg/kg)	asin(x/350)
UV-1-S	62	0.844	UV-1-1	7.2	0.023	UV-1-2	2.5	0.010	UV-1-3	2.5	0.007
UV-2-S	34	0.422	UV-2-1	24	0.077	UV-2-2	6.9	0.028	UV-2-3	2.5	0.007
UV-3-S	41	0.517	UV-3-1	36	0.116	UV-3-2	11	0.044	UV-3-3	2.5	0.007
UV-4-S	44	0.559	UV-4-1	19	0.061	UV-4-2	11	0.044	UV-4-3	2.5	0.007
UV-5-S	46	0.587	UV-5-1	2.5	0.008	UV-5-2	2.5	0.010	UV-5-3	2.5	0.007
UV-6A-S	75	1.128	UV-6A-1	2.5	0.008	UV-6A-2	2.5	0.010	UV-6A-3	2.5	0.007
UV-6B-S			UV-6B-1			UV-6B-2			UV-6B-3		
UV-6C-S			UV-6C-1			UV-6C-2			UV-6C-3		
UV-6D-S			UV-6D-1			UV-6D-2			UV-6D-3		
UV-7-S	17	0.206	UV-7-1	2.5	0.008	UV-7-2	2.5	0.010	UV-7-3	2.5	0.007
UV-8-S	25	0.306	UV-8-1	9.2	0.030	UV-8-2	2.5	0.010	UV-8-3	2.5	0.007
UV-9-S	11	0.133	UV-9-1	42	0.136	UV-9-2	2.5	0.010	UV-9-3	2.5	0.007
UV-10-S	6.5	0.078	UV-10-1	290	1.210	UV-10-2	5.2	0.021	UV-10-3	2.5	0.007
UV-11-S	19	0.231	UV-11-1	30	0.097	UV-11-2	250	1.571	UV-11-3	110	0.320
UV-12-S	11	0.133	UV-12-1	45	0.146	UV-12-2	2.5	0.010	UV-12-3	2.5	0.007
UV-13-S	30	0.370	UV-13-1	14	0.045	UV-13-2	2.5	0.010	UV-13-3	2.5	0.007
UV-14-S	25	0.306	UV-14-1	310	1.571	UV-14-2	12	0.048	UV-14-3	2.5	0.007
UV-15-S	2.5	0.030	UV-15-1	140	0.469	UV-15-2	95	0.390	UV-15-3	42	0.120
UV-16-S	83	1.571	UV-16-1	54	0.175	UV-16-2	26	0.104	UV-16-3	350	1.571
UV-17-S	38	0.476	UV-17-1	250	0.938	UV-17-2	170	0.748	UV-17-3	2.5	0.007
Mean	34	0.464	Mean	75	0.301	Mean	36	0.181	Mean	31.6	0.124
Var	542	0.161	Var	11027	0.225	Var	4996	0.165	Var	7468	0.145
n	17	17	n	17	17	n	17	17	n	17	17
t(90%)		1.337	t(90%)		1.337	t(90%)		1.337	t(90%)		1.337
t(95%)		1.746	t(95%)		1.746	t(95%)		1.746	t(95%)		1.746
t(crit)		11.371	t(crit)		11.043	t(crit)		14.105	t(crit)		15.655
90% UCL		46.5	90% UCL		136.2	90% UCL		76.9	90% UCL		85.8
95% UCL		49.2	95% UCL		149.1	95% UCL		86.4	95% UCL		98.6

	90% UCL	95% UCL
surface	46	49
1 foot	136	149
2 feet	77	86
3 feet	86	99
0-1	46	49
under	109	121
0-2	91	99
under	81	93
0-2.5	88	97
under	86	99
0-3	88	97

UVPW Stats (No 14-17)

Sample	x (mg/kg)	asin(x/75)	Sample	x (mg/kg)	asin(x/290)	Sample	x (mg/kg)	asin(x/250)	Sample	x (mg/kg)	asin(x/110)
UV-1-S	62	0.844	UV-1-1	7.2	0.023	UV-1-2	2.5	0.010	UV-1-3	2.5	0.007
UV-2-S	34	0.422	UV-2-1	24	0.077	UV-2-2	6.9	0.028	UV-2-3	2.5	0.007
UV-3-S	41	0.517	UV-3-1	36	0.116	UV-3-2	11	0.044	UV-3-3	2.5	0.007
UV-4-S	44	0.559	UV-4-1	19	0.061	UV-4-2	11	0.044	UV-4-3	2.5	0.007
UV-5-S	46	0.587	UV-5-1	2.5	0.008	UV-5-2	2.5	0.010	UV-5-3	2.5	0.007
UV-6A-S	75	1.128	UV-6A-1	2.5	0.008	UV-6A-2	2.5	0.010	UV-6A-3	2.5	0.007
UV-6B-S			UV-6B-1			UV-6B-2			UV-6B-3		
UV-6C-S			UV-6C-1			UV-6C-2			UV-6C-3		
UV-6D-S			UV-6D-1			UV-6D-2			UV-6D-3		
UV-7-S	17	0.206	UV-7-1	2.5	0.008	UV-7-2	2.5	0.010	UV-7-3	2.5	0.007
UV-8-S	25	0.306	UV-8-1	9.2	0.030	UV-8-2	2.5	0.010	UV-8-3	2.5	0.007
UV-9-S	11	0.133	UV-9-1	42	0.136	UV-9-2	2.5	0.010	UV-9-3	2.5	0.007
UV-10-S	6.5	0.078	UV-10-1	290	1.210	UV-10-2	5.2	0.021	UV-10-3	2.5	0.007
UV-11-S	19	0.231	UV-11-1	30	0.097	UV-11-2	250	1.571	UV-11-3	110	0.320
UV-12-S	11	0.133	UV-12-1	45	0.146	UV-12-2	2.5	0.010	UV-12-3	2.5	0.007
UV-13-S	30	0.370	UV-13-1	14	0.045	UV-13-2	2.5	0.010	UV-13-3	2.5	0.007
UV-14-S			UV-14-1			UV-14-2			UV-14-3		
UV-15-S			UV-15-1			UV-15-2			UV-15-3		
UV-16-S			UV-16-1			UV-16-2			UV-16-3		
UV-17-S			UV-17-1			UV-17-2			UV-17-3		
Mean	32	0.424	Mean	40	0.151	Mean	23	0.137	Mean	10.8	0.031
Var	429	0.093	Var	5855	0.104	Var	4646	0.186	Var	889	0.008
n	13	13	n	13	13	n	13	13	n	13	13
t(90%)		1.356	t(90%)		1.356	t(90%)		1.356	t(90%)		1.356
t(95%)		1.782	t(95%)		1.782	t(95%)		1.782	t(95%)		1.782
t(crit)		13.559	t(crit)		15.910	t(crit)		11.995	t(crit)		64.035
90% UCL		42.6	90% UCL		83.3	90% UCL		73.8	90% UCL		22.3
95% UCL		45.1	95% UCL		94.6	95% UCL		85.8	95% UCL		25.9

	90% UCL	95% UCL
surface	43	45
1 foot	83	95
2 feet	74	86
3 feet	22	26

	90% UCL	95% UCL	WET (90%)	WET (95%)
0-1	43	45	3.0	3.2
under	66	75	4.6	5.3
0-2	63	70	4.4	4.9
under	48	56	3.4	3.9
0-2.5	65	73	4.6	5.1
under	22	26	1.6	1.8
0-3	58	65	4.1	4.6

UVPW Stats (only 14-17)											
Sample	x (mg/kg)	asin(x/83)	Sample	x (mg/kg)	asin(x/310)	Sample	x (mg/kg)	asin(x/170)	Sample	x (mg/kg)	asin(x/350)
UV-1-S			UV-1-1			UV-1-2			UV-1-3		
UV-2-S			UV-2-1			UV-2-2			UV-2-3		
UV-3-S			UV-3-1			UV-3-2			UV-3-3		
UV-4-S			UV-4-1			UV-4-2			UV-4-3		
UV-5-S			UV-5-1			UV-5-2			UV-5-3		
UV-6A-S			UV-6A-1			UV-6A-2			UV-6A-3		
UV-6B-S			UV-6B-1			UV-6B-2			UV-6B-3		
UV-6C-S			UV-6C-1			UV-6C-2			UV-6C-3		
UV-6D-S			UV-6D-1			UV-6D-2			UV-6D-3		
UV-7-S			UV-7-1			UV-7-2			UV-7-3		
UV-8-S			UV-8-1			UV-8-2			UV-8-3		
UV-9-S			UV-9-1			UV-9-2			UV-9-3		
UV-10-S			UV-10-1			UV-10-2			UV-10-3		
UV-11-S			UV-11-1			UV-11-2			UV-11-3		
UV-12-S			UV-12-1			UV-12-2			UV-12-3		
UV-13-S			UV-13-1			UV-13-2			UV-13-3		
UV-14-S	25	0.306	UV-14-1	310	1.571	UV-14-2	12	0.048	UV-14-3	2.5	0.007
UV-15-S	2.5	0.030	UV-15-1	140	0.469	UV-15-2	95	0.390	UV-15-3	42	0.120
UV-16-S	83	1.571	UV-16-1	54	0.175	UV-16-2	26	0.104	UV-16-3	350	1.571
UV-17-S	38	0.476	UV-17-1	250	0.938	UV-17-2	170	0.748	UV-17-3	2.5	0.007
Mean	37	0.596	Mean	189	0.788	Mean	76	0.322	Mean	99.3	0.426
Var	1150	0.456	Var	12996	0.371	Var	5264	0.103	Var	28291	0.585
n	4	4	n	4	4	n	4	4	n	4	4
t(90%)	1.638		t(90%)	1.638		t(90%)	1.638		t(90%)	1.638	
t(95%)	2.353		t(95%)	2.353		t(95%)	2.353		t(95%)	2.353	
t(crit)	2.887		t(crit)	2.570		t(crit)	7.787		t(crit)	2.993	
90% UCL	75.7		90% UCL	297.6		90% UCL	138.0		90% UCL	304.1	
95% UCL	81.7		95% UCL	309.3		95% UCL	161.0		95% UCL	339.6	

	90% UCL	95% UCL
surface	76	82
1 foot	298	309
2 feet	138	161
3 feet	304	340

	WET (90%)	WET (95%)
0-1	5.3	5.7
under	18.2	19.6
0-2	13.1	13.7
under	15.5	17.5
0-2.5	12.4	13.2
under	21.3	23.8
0-3	13.9	15.0

EXAMPLE PROBLEM - SOLUTION FOR UCL (FROM SERENA PARK REPORT - TO# 05-314200-GT)

Sample	x (mg/kg)	y = asin(x/51)	
SP-2-S	8.8	0.173	The total lead concentrations are transformed by dividing each concentration by the maximum observed total lead concentration (51 mg/kg in this case). This results in fractionalized data ranging from close to zero to 1. The arcsine of each fractionalized data is then calculated resulting in the transformed data set.
SP-9-S	11	0.217	
SP-1-S	13	0.258	
SP-8-S	13	0.258	
SP-3-S	24	0.490	
SP-4-S	31	0.653	
SP-5-S	43	1.003	
SP-10-S	45	1.081	
SP-7-S	48	1.226	
SP-6-S	51	1.571	
Max(x)	51		
n	10	10	
Mean(x)	29		Mean(x) = sum(x)/n
Mean(y)		0.693	Mean(y) = sum(y)/n
Var(x)	286		Var(x) = [sum(x)^2 - (sum(x))^2] / n(n-1)
Var(y)		0.247	Var(y) = [sum(y)^2 - (sum(y))^2] / n(n-1)
t(90%)		1.383	Student's t-value for 90% confidence limit (80% confidence interval)
t(95%)		1.833	Student's t-value for 95% confidence limit (90% confidence interval)
90% UCL		40.3	= Max(x) * [sin(Mean (y) + t(90%) * sqrt(var(y)/n)]
95% UCL		42.4	= Max(x) * [sin(Mean (y) + t(95%) * sqrt(var(y)/n)]

