

June 13, 1997  
961163NB

Ms. Madhulla Logan  
Hazardous Materials Specialist  
Alameda County Department of Environmental Health  
1131 Harbor Bay Parkway  
Alameda, CA 94503

**Subject: Removal Action Workplan for Lead-Impacted Soil  
Encinal Real Estate Site, Alameda, California**

Dear Ms. Logan:

Woodward-Clyde Consultants (WCC), on behalf of Encinal Real Estate, Inc., is pleased to submit this work plan for performing excavation and off-site disposal of lead-impacted soil followed by backfilling at the planned Encinal Real Estate site in Alameda, California (the site). The activities include soil excavation, stockpile characterization, soil sampling, field and confirmation laboratory analysis, remediation by off-site disposal of the excavated soil, and site restoration. A commercial development is planned for future use of the site.

## **PREVIOUS INVESTIGATIONS**

Previous investigations performed by WCC for the site include an Environmental Summary Report, dated August 14, 1996 (WCC, 1996), and a Site Characterization Report and Remediation Plan, dated April 1997 (WCC, 1997). Table 3 from WCC (1997) contains a listing of results for Title 22 Metals including lead. Figure 3 of WCC (1997) presents the sampling locations in the area of concern for lead. Both the table and figure have been attached for your convenience. The laboratory results indicated that lead was detected at concentrations above the commercial use scenario Preliminary Remediation Goal (PRG) of 1,000 mg/kg for lead in soil.

## **CLEANUP GOAL FOR THE SOIL EXCAVATION**

As shown in WCC (1996 and 1997), lead was detected in shallow soil at concentrations above USEPA Region 9 commercial PRGs. The soil to be excavated is that impacted by lead at concentration above 1,000 mg/kg, as discussed in the meeting with you on June 10, 1997.

## **REMOVAL ACTION SPECIFICATIONS**

A qualified and licensed contractor will be retained to perform the excavation work. Soil in areas where lead was detected at concentration exceeding the 1,000 mg/kg goal will be



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excavated, stockpiled on-site, characterized, and disposed off-site based on the analytical results.

During excavation activities, one soil sample will be collected on sidewalls every 20 feet along the perimeter and one for every 400 square feet at the bottom of the excavation pit. Excavation activities will cease when the confirmation soil samples detected lead concentration is less than 1,000 mg/kg total lead. In addition, about five soil samples with relatively high lead concentration will be also tested for leachability. No excavation is planned for sample locations with lead concentrations below the cleanup goal. Soil within approximately two feet of the water table will be left undisturbed.

## HEALTH AND SAFETY PLAN

A WCC site-Specific Health and Safety Plan (HSP) will be developed for removal actions at the site. The HSP will include a discussion of anticipated hazards and risks, an exposure monitoring plan for dust, dust control measures, general health and safety requirements, area control, reports, emergency procedures, and references. The route from the site to the nearest hospital will also be provided in the HSP.

## SAMPLING AND ANALYSIS SPECIFICATIONS

### In-Situ Soil Samples

Soil samples will be analyzed for total lead using a portable laboratory equipped with an X-Ray Fluorescence (XRF) Spectrophotometer. Ten percent confirmation samples shall be collected and analyzed at a California Approved Analytical Laboratory as confirmation samples for total lead. A regression curve analysis may be developed to show the correlation between the field XRF data and the analytical laboratory data for total lead. EPA guidance requires a 70 percent correlation between XRF and analytical laboratory data. WCC experience is that this criteria is easily met.

### Ex-Situ Soil Samples

The excavated soil will be stockpiled on-site prior to off-site disposal. A four-point composite sample will be collected, as required by the disposal facility. The four-point composite soil samples will be analyzed using the XRF in the field for total lead with ten percent confirmation sampling at an analytical laboratory for total lead. As required for disposal, the four-point composite samples shall also be analyzed at an analytical laboratory for soluble lead using the California Waste Extraction Test method (CWET). If the CWET test results exceed the Soluble



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Threshold Limit Concentration (STLC) of 5 mg/L for lead, the soil represented will be considered a California hazardous waste, and the Toxicity Characteristic Leaching Procedure (TCLP) test will be performed on the soil to evaluate whether the soil is a federal hazardous waste.

## DISPOSAL OPTIONS

Depending on the analytical results, excavated soil will either be disposed of at an off-site Class II or Class I landfill, either in California or out-of-state, according to the following options:

- If analytical results for total lead concentrations for the four-point composite soil samples from excavated soil are below the TTLC of 1,000 mg/kg and soluble lead concentrations using the CWET are below the STLC of 5 mg/L, the soil is not a hazardous waste and may be disposed of at a California Class II landfill.
- If analytical results for total lead concentrations for the four-point composite soil samples from excavated soil are below the TTLC of 1,000 mg/kg and soluble lead concentrations using the CWET are above the STLC of 5 mg/L, then the soil is considered a California hazardous waste. If soil is disposed in state, then the soil would need to be disposed at a Class I California landfill. However, if the TCLP results are below the regulatory limit of 5 mg/L, then the soil can be disposed of at an out-of-state Class II landfill as a non-Resource Conservation and Recovery Act (RCRA) waste.
- If total lead results for the four-point composite soil samples are greater than the TTLC of 1,000 mg/kg and the soluble lead results using the CWET are less than the STLC of 5 mg/L for excavated soil, the soil will be analyzed for the federal TCLP test criteria for soluble lead.
  - If TCLP results are less than the regulatory limit of 5 mg/L, then the soil may be disposed as a California Hazardous Waste.
  - If TCLP results are greater than the regulatory limit of 5 mg/L, then the soil will be disposed of as a federal RCRA hazardous waste.



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## SITE RESTORATION

Backfilling and site restoration activities will be performed as described below.

- If existing stockpiled soil is to be used for fill, a four-point composite sample will be collected at a minimum from each 100 cubic yards of on-site stockpiled soil.
- On-site soil or clean imported backfill will be placed in uniform lifts not exceeding 10 inches in uncompacted thickness.
- The soil will be brought to 1 to 3 percent above the optimum moisture content.
- The fill will be compacted to a minimum of 90 percent relative compaction.
- The level of compacted fill will be placed to meet the original grade and provide surface drainage away from the excavation area.

Upon completion of the project, all equipment and construction materials will be decontaminated and removed from the site. Waste from decontamination activities will be sampled and analyzed for lead and disposed of properly.

## REPORTING

A report will be prepared documenting the excavation, sampling, laboratory analyses, off-site disposal, and site restoration activities.

## LIMITATIONS

This workplan has been prepared by the staff of Woodward-Clyde Consultants solely for the use of Encinal Real Estate, Inc.. The scope was limited to the requested scope of work as defined by Encinal Real Estate, Inc.. The findings, recommendations, specifications, or professional opinions are presented, within the limits prescribed by Encinal Real Estate, Inc., after being prepared in accordance with generally accepted engineering practice in Northern California at the time this workplan was prepared. No other warranty is either expressed or implied. Any reliance on this report by third parties shall be at such party's sole risk.



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We appreciate the opportunity to offer this workplan to you. If you have any questions, or if we can offer any further assistance, please call Al Ridley at (510) 874-3125 or Marco at (510) 874-3254.

Sincerely,



Marco C. Lobascio, P.E., R.E.A.  
Assistant Project Engineer



Albert P. Ridley, C.E.G.  
Senior Consultant

cc: Richard Kraber  
Peter Wang  
Charles Olson, Esq.  
Xinggong Tong, WCC



ATTACHMENTS

Relevant Tables and Figures from Previous Soil Investigations

TABLE 3

SOIL ANALYTICAL RESULTS FOR DETECTED METALS

Location	Depth [feet]	Metals [mg/kg]											
		Arsenic	Barium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Vanadium	Zinc
<b>Geoprobe Grab Sample</b>													
SG-1	0.5 - 1	2.4	67	<0.5	28.6	7.6	14.8	3.1	0.083	3.1	36.1	25.5	31.9
SG-2	0.5 - 1	5.9	200	<0.5	9.1	13.2	39.1	4.4	0.096	<1	15.3	47.3	79.4
SG-3*	na	na	na	na	na	na	na	na	na	na	na	na	na
SG-4	0.5 - 1	14.4	103	<0.5	26	6.4	20.3	14.1	0.27	2.7	20.6	25.7	62.9
SG-5	0.5 - 1	5.3	63.9	<0.5	15.3	9.3	12.5	5.5	0.23	1.7	17.2	32.4	68.4
SG-6	0.5 - 1	2.3	39.1	<0.5	5.8	7.2	8.6	3.7	0.11	1.1	7	34.6	80.4
SG-7	0.5 - 1	8	48	<0.5	34.8	13.7	12.1	5.3	0.098	<1	47	38.9	54.7
SG-8	0.5 - 1	3.2	64.3	<0.5	11.7	8.5	12.4	5	0.16	1.6	12.6	36.5	84.9
SG-9	0 - 0.5	8.3	100	<0.5	34	9.9	40.6	79.2	0.22	<1	43.2	30.1	121
SG-10	0.5 - 1	3	81.6	<0.5	46.6	6.4	12	5.2	0.037	13	22.9	18.4	25.2
SG-11	0.5 - 1	5.3	254	1.6	33.6	12.4	15.4	10	<0.033	<1	33.7	33.2	44.6
SG-12	0.5 - 1	2.6	116	<0.5	23.6	6.8	10.6	7.9	0.044	<1	26.1	21.3	28.9
SG-13	0.5 - 1	4.7	44.5	<0.5	2	11.6	32.2	4	0.22	<1	<4	29.5	61
SG-14	0.5 - 1	6.1	227	<0.5	20.2	11.8	27.8	35.9	0.93	<1	26.5	29	120
SG-15	0.5 - 1	2.9	95.4	<0.5	23.1	7.4	16.2	4.2	<0.033	<1	48	37.5	33.7
SG-16	0.5 - 1	2	26.6	<0.5	28.3	4.8	6.4	7.9	<0.033	<1	27.3	19.1	26.2
<b>Hand-Auger Sample</b>													
SS-1*	na	na	na	na	na	na	na	na	na	na	na	na	na
SS-2	0.5 - 1	2.8	33.1	<0.5	15.7	6.2	9.2	6.4	0.12	1.5	23.1	25.9	48.6
SS-3	0.5 - 1	4.2	54	<0.5	6.2	10.3	22	2.5	0.048	<1	9.4	37.8	51.1
SS-4	0 - 0.5	3.5	58.6	<0.5	33.4	7.3	27.5	26.1	0.047	<1	36.9	26.7	65.2
SS-5	0 - 0.5	2.8	48.3	<0.5	30.5	5.1	21.9	31.5	0.07	<1	25.1	20.4	49.7
SS-6	0 - 0.5	8	99.9	<0.5	28.7	9.7	29.8	55.8	0.17	<1	30.8	37.9	121
SS-7	0 - 0.5	16	90.2	0.8	25.3	8.7	24.3	39.2	0.16	1.2	28.7	38.5	106
SS-8	0 - 0.5	4.7	68.6	<0.5	25.4	7.1	20.8	36.3	0.11	<1	24.3	33.1	91.7
SS-9	0.5 - 1	5.1	88.1	0.57	46.6	9.6	54.3	310	0.17	<1	41.6	37	122
SS-10	0.5 - 1	16.3	60.4	<0.5	34	6.1	48.7	45.3	0.47	1.1	27.9	18.6	179
SS-11	0.5 - 1	na	na	na	na	na	na	43,000	na	na	na	na	na
<b>Maximum Concentrations</b>		16.3	254	1.6	46.6	13.7	54.3	43,000	0.93	13	48	47.3	179
<b>R. 9 PRGs - Commercial</b>		24	100,000	850	640	97,000	63,000	1,000	68	8,500	34,000	2,400	100,000

na = Not analyzed/not available

Exceeds the commercial Preliminary Remediation Goal (PRG) based on  $1 \times 10^{-5}$  carcinogenic risk or a unit hazard quotient.

TABLE III

RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES FOR TITLE 22 METALS  
results in mg/kg

	B-1	B-2	B-3	B-4	B-5	B-6	B-7	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	M-1	M-2	R 9 Comm. PRG mg/kg	Title 22 TTLIC
Antimony	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	680	500
Arsenic	5.1	7	3.5	6.9	8.6	12.8	6.2	5.2	9.3	7.2	2.5	2.7	4.7	7	8.7	6.7	6.3	3.5	3.2	24	500
Barium	73.9	78.1	50.5	37.1	163	112	243	72	82.5	112	57.1	42.7	81.8	91.1	100	3.8	99.1	10.9	24.2	10,000	10,000
Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.69	<0.5	0.58	0.52	<0.5	<0.5	11	75
Cadmium	0.87	<0.5	<0.5	<0.5	0.88	0.91	<0.5	<0.5	0.62	<0.5	<0.5	<0.5	<0.5	0.7	0.82	0.61	0.8	<0.5	<0.5	850	100
Chromium	36.8	30.9	47.2	51.4	192	48.6	108	157	34.9	38.1	28.8	27.5	37.7	42	49	64.2	31.7	16.1	44.4	640	2,500
Cobalt	7.9	8	7.3	9.4	17	13.9	23.2	14.8	9.2	9.3	5.5	6	9.8	14.7	13.2	10	14.2	5.7	7.8	97,000	8,000
Copper	138	62.9	22.2	35.5	61.4	119	21.7	35	39.3	103	20.1	41.8	20.9	58.8	65.4	39.5	68.9	22.2	28.8	63,000	2,500
Lead	419	159	35.5	11.1	6,440	192	22.9	6,140	74.4	179	22.2	28.8	32.7	80.8	188	26.5	214	25.5	10	1,000	1,000
Mercury	0.14	0.089	0.1	0.088	0.21	0.18	0.084	0.051	0.19	0.16	0.04	0.071	0.064	0.15	0.25	0.3	0.19	0.038	<0.033	68	20
Molybdenum	<1	1.4	<1	1.1	2.7	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	1	<1	<1	8,500	3,500
Nickel	34.5	42.7	40.4	48.8	72.5	75.7	143	87.2	29.6	48.9	29.1	33.6	36.7	64.3	59.6	58	52.2	23.2	44.2	34,000	2,000
Selenium	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	8,500	100
Silver	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	8,500	500
Thallium	<1	1.3	<1	<1	2.4	1.9	<1	<1	<1	<1	<1	<1	<1	<1	1.4	<1	1.3	<1	<1	120	700
Vanadium	34.2	27.5	28.9	45.8	41.7	39.9	31	30.2	39.3	31.4	24	29.8	38.4	40.3	45.3	53.1	53.9	26.4	38.2	12,000	2,400
Zinc	122	105	55.1	57.7	2,950	134	73.9	93.4	121	127	43.6	55.5	56.3	120	142	95.5	242	76.9	62.4	100,000	5,000

Exceeds the commercial Preliminary Remediation Goal (PRG) based on  $1 \times 10^{-5}$  carcinogenic risk or a unit hazard quotient.



**TABLE III a**  
**LEAD ANALYTICAL RESULTS FOR SOIL**  
**ABL RAILROAD RIGHT-OF -WAY**  
**RAIL LINE AREA**

Location	Date Sampled and Analyzed	Result [mg/kg]
CHECK-1	11-Sep-96	93
CHECK-2	11-Sep-96	200
B5-P1	11-Sep-96	5,300
B5-P2	11-Sep-96	2,500
B5-P3	11-Sep-96	7,200
B5-B1	11-Sep-96	88
B5-B2	11-Sep-96	270
B5-P4	11-Sep-96	950
B5-P5	11-Sep-96	1,600
B5-P6	11-Sep-96	20,000
B5-P7	11-Sep-96	110
SS-4	11-Sep-96	560
SS-5	11-Sep-96	260
SS-6	11-Sep-96	390
B5-P8	12-Sep-96	1,200
B5-P10	12-Sep-96	5,100
B5-P9	12-Sep-96	1,300
B5-P11	12-Sep-96	260
SS-7	12-Sep-96	6,100
SS-8	12-Sep-96	5,500
SS-9	12-Sep-96	1,700
SS-10	12-Sep-96	840
SS-11	12-Sep-96	1,000
SS-14	12-Sep-96	390
SS-12	12-Sep-96	2,900
SS-13	12-Sep-96	830
SS-16	12-Sep-96	1,200
SS-17	12-Sep-96	630
SS-15	12-Sep-96	110
SS-18	12-Sep-96	380
SS-19	12-Sep-96	690
SS-20	12-Sep-96	100
SS-21	12-Sep-96	690
SS-22	12-Sep-96	1,600
SS-23	12-Sep-96	190
SS-5-P1	12-Sep-96	180
SS-5-P2	12-Sep-96	230
SS-5-P3	12-Sep-96	110
SS-6-P1	12-Sep-96	2,200
SS-6-P2	12-Sep-96	260
SS-6-P3	12-Sep-96	570

**TABLE III a**

**LEAD ANALYTICAL RESULTS FOR SOIL  
ABL RAILROAD RIGHT-OF -WAY  
RAIL LINE AREA**

<b>Location</b>	<b>Date Sampled and Analyzed</b>	<b>Result [mg/kg]</b>
SS-24	12-Sep-96	273
SS-25	12-Sep-96	1,100
SS-26	12-Sep-96	430
SS-27	12-Sep-96	340
SS-28	12-Sep-96	600
SS-29	12-Sep-96	1,000
SS-31	12-Sep-96	400
SS-32	12-Sep-96	410
SS-33	12-Sep-96	6,400
SS-30	12-Sep-96	620
SS-34	13-Sep-96	320
SS-35	13-Sep-96	320
SS-49	13-Sep-96	1,600
SS-50	13-Sep-96	1,700
SS-51	13-Sep-96	460
SS-52	13-Sep-96	17,000
SS-53	13-Sep-96	630
SS-57	13-Sep-96	1,700
SS-58	13-Sep-96	300
SS-59	13-Sep-96	860
SS-60	13-Sep-96	110
SS-61	13-Sep-96	190
SS-62	13-Sep-96	410
SS-63	13-Sep-96	370

**Note:**

Analysis was performed using Energy Dispersive X-ray Fluorescence.

Lead concentrations that exceed the target level of 1,000 mg/kg.

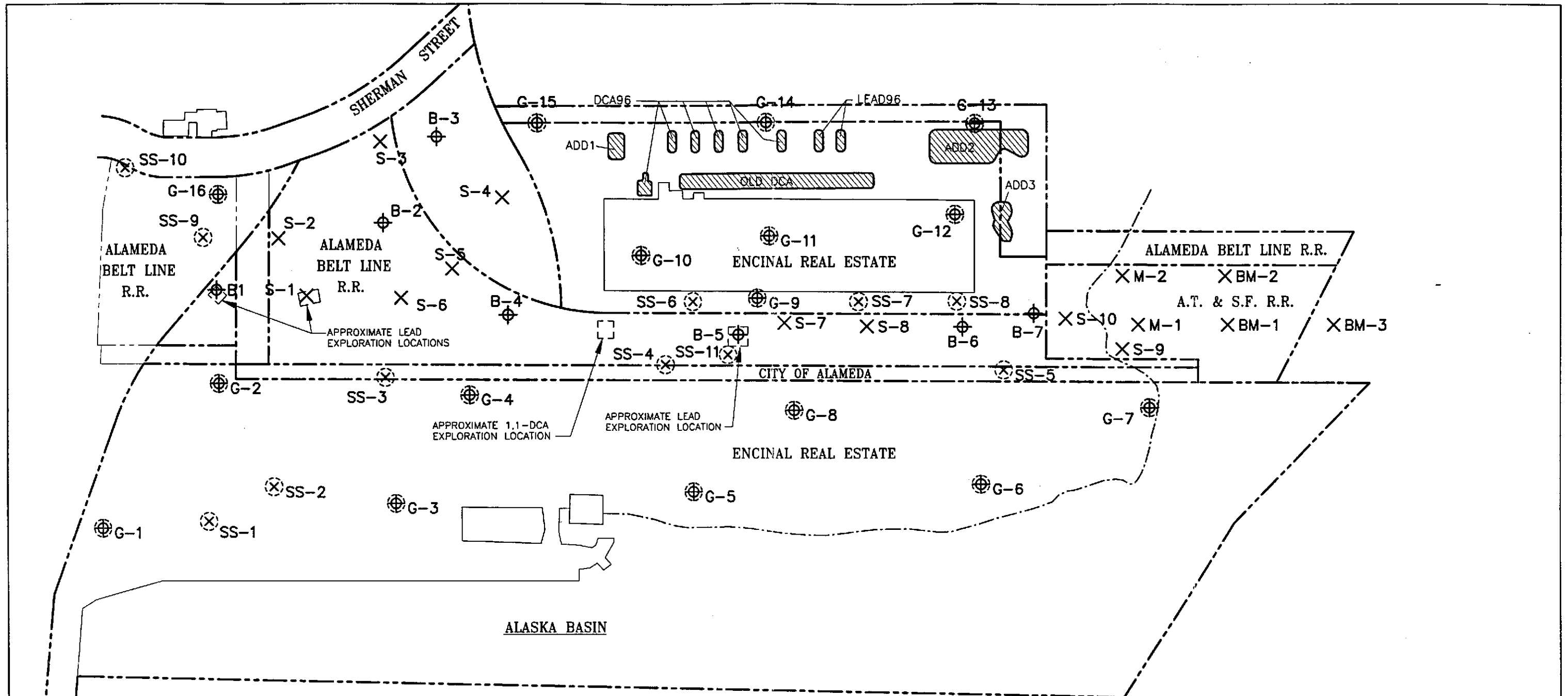
**TABLE III b**  
**LEAD ANALYTICAL RESULTS FOR SOIL**  
**ABL RAILROAD RIGHT-OF -WAY**  
**TRIANGLE AREA**

Location	Date Sampled and Analyzed	Result [mg/kg]
S1-P1	11-Sep-96	66
S1-P2	11-Sep-96	68
S1-P3	11-Sep-96	74
S1-B1	11-Sep-96	83
S1-B2	11-Sep-96	94
B1-P1	11-Sep-96	87
B1-P2	11-Sep-96	100
B1-P3	11-Sep-96	160
B1-B1	11-Sep-96	220
SS-1	11-Sep-96	97
SS-2	11-Sep-96	110
SS-3	11-Sep-96	98
SS-36	13-Sep-96	79
SS-37	13-Sep-96	100
SS-38	13-Sep-96	110
SS-39	13-Sep-96	87
SS-40	13-Sep-96	150
SS-41	13-Sep-96	63
SS-42	13-Sep-96	98
SS-43	13-Sep-96	120
SS-44	13-Sep-96	600
SS-45	13-Sep-96	200
SS-46	13-Sep-96	150
SS-47	13-Sep-96	97
SS-48	13-Sep-96	200
SS-55	13-Sep-96	160
SS-44-P1	13-Sep-96	39
SS-44-P2	13-Sep-96	60
SS-44-P3	13-Sep-96	90
SS-56	13-Sep-96	200

**Note:**

Analysis was performed using Energy Dispersive X-ray Fluorescence.

Lead concentrations that exceed the target level of 1,000 mg/kg.



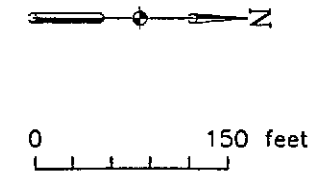
**LEGEND**

Current Investigation, January 1997

- ⊕ G-5 Geoprobe location
- ⊗ SS-2 Shallow soil location
- ▨ Stockpiles

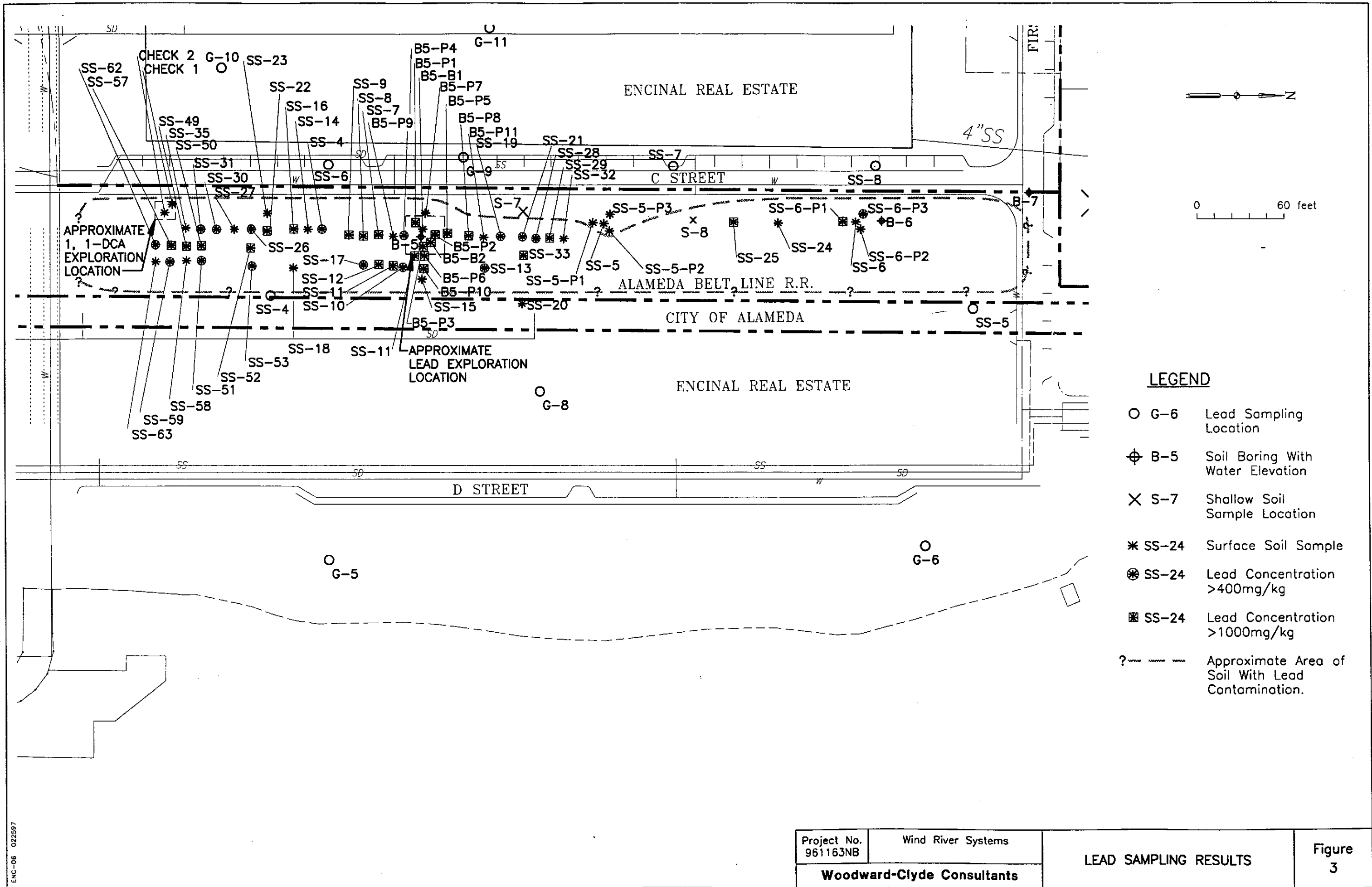
Previous Investigation, 1996

- ⊕ B-1 Soil boring with water elevation
- ⊗ S-1 Shallow soil sample
- ⊗ M-1 Shoreline sediment
- ⊗ BM-1 Bottom sediment



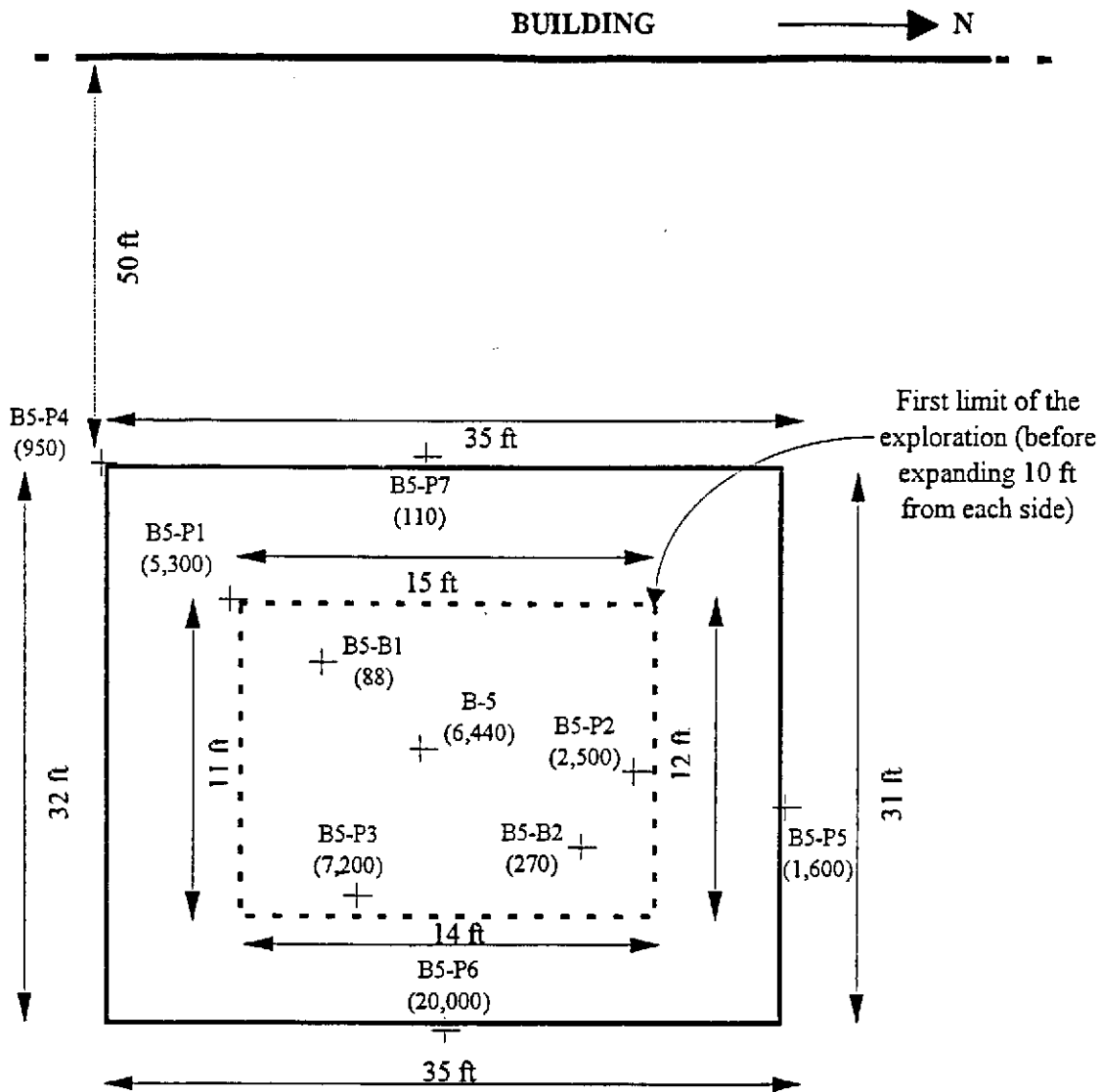
ENC-05 040897

Project No. 961163NB	Wind River Systems	<b>SAMPLING LOCATIONS</b>	<b>Figure 1</b>
<b>Woodward-Clyde Consultants</b>			



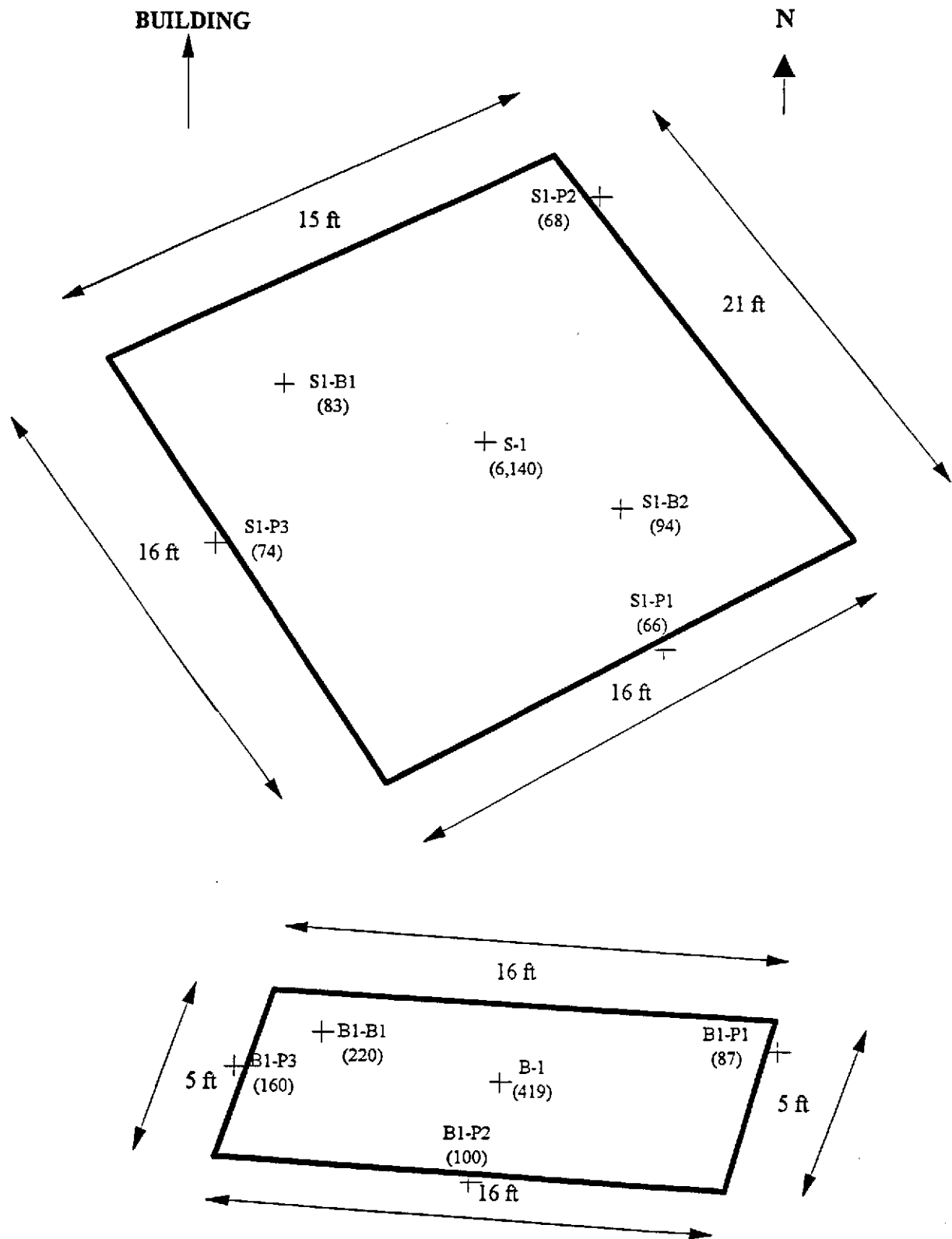
Project No. 961163NB	Wind River Systems	LEAD SAMPLING RESULTS	Figure 3
Woodward-Clyde Consultants			

ENC-06 022597



B5-P6 (20,000) + **Legend:**  
 + Soil sample location  
 (lead concentration [mg/kg])  
 Soil samples collected at 1 foot deep  
 (exploration not to scale)

Project No. 961163NA	ENCINAL REAL ESTATE, INC.	<b>B-5 LEAD EXPLORATION</b>	Figure 4
<b>Woodward-Clyde Consultants</b>			



**Legend:**  
 - Soil sample location  
 (lead concentration [mg/kg])  
 Soil samples collected at 1 foot deep  
 (exploration not to scale)

Project No. 961163NA	ENCINAL REAL ESTATE, INC.	<b>S-1 AND B-1 LEAD EXPLORATION</b>	Figure 5
<b>Woodward-Clyde Consultants</b>			